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Comment On: NRC-2014-0137-0001
Draft Guidance Regarding the Alternate Pressurized Thermal Shock Rule

Document: NRC-2014-0137-DRAFT-0011
Comment on FR Doc # 2015-05754

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80 FR 13449
10

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General Comment

Dear NRC,

Please see the attached file, Official Transcript of Proceedings, NUCLEAR REGULATORY COMMISSION, Title: Entergy Nuclear Operations, Inc., Palisades Nuclear Plant, Docket Number: 50-255-LA, ASLBP Number: 15-936-03-LA-BD01, Location: Rockville, Maryland, Date: Wednesday, March 25, 2015 (135 pages).

Please accept our (our environmental coalition's -- Beyond Nuclear, Don't Waste MI, MSEF--Shoreline Chapter, NEIS -- as articulated by our attorney, Terry Lodge) numerous challenges and criticisms contained therein, in the context of Entergy Nuclear's July 2014 License Amendment Request for 10CFR50.61a regulatory relief, as public comments in your DG-1299/NUREG-2163 proceeding. Thank you.

Sincerely,

Kevin Kamps, Beyond Nuclear (and Don't Waste Michigan, board member representing the Kalamazoo Chapter)

Attachments

3 25 15 ASLBP pre hearing transcript

Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title:	Entergy Nuclear Operations, Inc. Palisades Nuclear Plant
Docket Number:	50-255-LA
ASLBP Number:	15-936-03-LA-BD01
Location:	Rockville, Maryland
Date:	Wednesday, March 25, 2015
Work Order No.:	NRC-1469 Pages 1-134

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NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD PANEL

+ + + + +

HEARING

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In the Matter of: : Docket No.

ENTERGY NUCLEAR : 50-255-LA

OPERATIONS, INC. : ASLBP No.

(Palisades Nuclear Plant) : 15-936-03-LA-BD01

----------x

Wednesday, March 25, 2015

Nuclear Regulatory Commission

Hearing Room T-3 B45

11545 Rockville Pike

Rockville, Maryland

BEFORE:

RONALD M. SPRITZER, Chair

GARY S. ARNOLD, Administrative Judge

THOMAS J. HIRONS, Administrative Judge

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PARTIAL INDEX

P R O C E E D I N G S

10:01 a.m.

CHAIR SPRITZER: Good morning. We are here today to hear oral argument in the case of Entergy Nuclear Operations, Inc., Palisades Nuclear Plant. This is Docket No. 50-255-LA. It is also ASLBP No. 15 -- excuse me -- 15-936-03-LA-BD01.

And we are here to hear oral argument on standing and the admissibility of the, essentially, one contention in the petition.

Before we go any further, I will introduce myself and my fellow Judges. I am Ronald Spritzer. I am the Chairman of this Board. I am an attorney, and prior to coming here, I spent most of my legal career in the Environment Division of the Justice Department.

JUDGE ARNOLD: I am Gary Arnold, a Technical Judge. I have a PhD in Nuclear Engineering, and I spent my first career in the Naval Reactors Program.

JUDGE HIRONS: I am Tom Hirons. I have a PhD in Nuclear Engineering. I spent 34 years at Los Alamos National Lab and retired from there about eight years ago.

CHAIR SPRITZER: We also have with us two

law clerks on this case, Sachin Desai seated to my left and Nicole Pepperl, who is over seated to my right.

Why don't we have the parties' representatives introduce themselves, and anybody that may be seated at counsel table with you, starting on my left.

MR. LINDELL: My name is Joseph Lindell, representing the NRC Staff. I have with me on my left from OGC -- from the Office of the General Counsel, David Roth and Sherwin Turk, and on my right is our technical expert, Mark Kirk from the Office of Research.

MR. KUYLER: Good morning, Your Honor. Ray Kuyler from Morgan Lewis and Bockius. With me at counsel table is my colleague Paul Bessette; Jeanne Cho, Senior Counsel at Entergy; and we also have Dan DePuydt, Senior Lead Engineer at the Palisades Plant who is with us as well.

CHAIR SPRITZER: Thank you.

MR. LODGE: Good morning. I am Terry Lodge. I am the attorney for the Petitioners here, and to my right is Michael Keegan of Don't Waste Michigan, one of the intervening parties, and to my left is Kevin Kamps of Beyond Nuclear, another one of

the intervening parties.

CHAIR SPRITZER: Very well, thank you.

We've already covered the procedure we're going to follow in our order, but let me just go through it again.

We will allow introductory statements from each of the groups of -- each of the parties, including -- starting with the Petitioners. We gave you 15 minutes for -- for the Petitioners. You can reserve, if you choose, five minutes of that for a rebuttal. Do you want -- do you want to reserve the five minutes for a rebuttal?

MR. LODGE: Your Honor, I would like to reserve about two minutes for rebuttal.

CHAIR SPRITZER: Two minutes for rebuttal, okay, so you'll have 13 minutes for your opening statement.

What we will do then after you've finished -- we will try and refrain to the extent we can from interrupting your opening statement with questions. However, we will definitely have questions after you're finished, so you will stay -- you will stay -- we will start that questioning once you've finished your opening statement, so you're not finished at that point, when you finish your opening. In other words,

we'll stay with you until we have -- until we have asked all the questions we think are necessary, which will quite likely go well beyond the initial 15 minutes.

We will then move to the -- to Entergy, and you will have 10 minutes for your introductory statement. We'll follow the same procedure, that is, any questions we have for you, we will proceed immediately to those, and the same procedure for the Staff, 10 minutes for your more or less uninterrupted opening statement if you want to make one, and then any questions we might have for you.

You are not -- no one is required, of course, to make an opening statement, but we'll give you that time if you want to use it.

We will plan on taking at least one break, probably after about an hour or so, and we hope to finish before lunch. I think if we get out -- get done by in the 12:00 to 12:30 range, we will try and do that without -- that is, without stopping for lunch. If it looks like we're going to go significantly beyond 12:30, then we would plan on taking a break for lunch.

No one has accepted argumentation or notified us that they intended to use any visual aids,

so we are assuming there are no -- nothing is going to be displayed on the screens up here during -- during the argument.

We will -- for questioning purposes, you may have one of your colleagues answer the question, as we don't insist that the person who makes the opening presentation has to answer all the questions themselves, but when you do -- whoever speaks, please identify yourself. We want to make sure that we get a good record and know who is answering each question.

We are aware that a new petition has been filed on I believe it was March 9th, also related to Palisades and the issue of embrittlement, but we're not going to discuss that today when the answers haven't even been filed yet, so that -- that is not before us today, we don't want to have any discussion or argument of that new petition.

There is a telephone audience. You probably will not be able to hear them, at least, that is the way the technology is supposed to work, but there are somewhere in the order of I believe about 40 individuals who indicated they would be listening. We don't have any way of knowing for sure precisely how many, but there are people listening on the phone. They do not have the ability, however, to speak. It

is strictly listen-only.

I think that is all I have, unless my colleagues have any issues to raise at this point.

Does anyone have any questions about the procedure we're going to follow here today before we get started?

(No audible response.)

CHAIR SPRITZER: Hearing no takers, why don't we proceed with the Intervenors, then?

MR. LODGE: Thank you --

CHAIR SPRITZER: Petitioners, excuse me.

MR. LODGE: Yes.

I am going to stand because these events become a long sitdown.

I am Terry Lodge, of course speaking on behalf of the Petitioners today, Counsel and parties for the Applicant and Counsel and accompanying parties for the Staff, and may it please the Board.

First, we have an objection as to the way this procedure is -- is being conducted this morning. We believe that the inquiry here is -- because it is not an evidentiary hearing, we are ordered at one and the same time by the pre-hearing order of the Board to not refer to -- not rehash evidence and not to attempt to introduce new evidence.

CHAIR SPRITZER: The first is incorrect. The second is correct. No new evidence. You may refer to things that have been --

MR. LODGE: Oh --

CHAIR SPRITZER: -- referred to in the -- in the --

MR. LODGE: All right.

CHAIR SPRITZER: -- in the pleadings.

MR. LODGE: Okay. Well, very good. That helps clarify one of the problems I have, because it appears to the Petitioners that in effect, the Board may be trying to essentially conduct a trial within a trial here where you're weighing whether there's enough evidence to warrant having a hearing on the merits of the evidence, and we're very concerned that that might be an improper means of getting to the merits of the issue before this Board today, which is simply whether or not threshold requirements have been met by the Petitioners to allow a hearing, an evidentiary hearing on the merits.

CHAIR SPRITZER: Okay. Well, I -- we understand that this is not the place to weigh evidence. However, we do have to determine if material issues have been --

MR. LODGE: Correct.

CHAIR SPRITZER: -- raised, so I think it would help if you would focus your argument on explaining where a material issue has been raised in your petition.

MR. LODGE: Thank you, and that is what we will attempt to do, sir. Thank you.

After a 44-year operating history which saw the Palisades Nuclear Power Plant reactor pressure vessel display troubling signs and incrementally worsening signs of embrittlement, even by the early 1980s, the verified proof in the period since the 1980s has contributed to an even greater level of concern.

Palisades' owners have successfully pushed back the criteria for what is deemed to be a dangerous embrittled condition of the RPV no fewer than six times.

Now, armed with a new rule that allows Entergy to trade off scientifically verified surveillance for computer projections and computations of probabilistic risk assessments, which we take as code for what are the chances of anything serious happening at Palisades, 10 CFR 50.61(a) is now in place to allow Entergy to substitute these estimates of the status of the reactor pressure vessel for

actual data, actual investigation and analysis.

This comes, as I say, after at least half a dozen instances where by following 50.61, which does impose some degree of scientific and physical data rigor on the determination, that now that process seems to be -- there is some need for it to be abandoned, and the substitute being no more physical analysis of the metallurgical toughness parameters, but instead, simply estimating, and estimating in a way that somehow the remedial process, for instance, of annealing of the RPV can be avoided.

Now, Entergy and the Staff will tell the Board that all that has happened with Entergy's invocation of 10 CFR 50.61(a) is that Entergy is freely exercising a new option that is available, as though 50.61's scientific rigor and 50.61(a)'s mathematical conjecturings are somehow resting on an equal footing.

We anticipate they will maintain that the Intervenors simply can't argue to this Panel that the Licensing Board should bar Entergy from using the freely available option of the 50.61(a) route, and that the Licensing Board cannot order the utility to choose the route that the Licensing Board directs must be followed. That, in our preference, of course, was

in 10 CFR 50.61.

These arguments should be disregarded. Section 50.61's science is not on an equal footing with the speculative features of 50.61(a), but even 50.61(a) starts with reference to physical and scientific data.

As to 50.61(a), our expert, a nuclear engineer Arnold Gundersen, has stated that Entergy has failed tests of mathematical and statistical adequacy, but Arnie Gundersen is not the only one saying that. The Westinghouse Materials Center of Excellence, which in its 2014, June 2014 WCAP Report, in its first paragraph of the executive summary, states: "The alternate rule provides a new metric and screening criteria for PTS. This metric, RT(max-x), and the corresponding screening criteria, are far less restrictive than the RTPTS metrics and screening criteria in the original PTS rule, that being 10 CFR 50.61."

Westinghouse attempts to validate Entergy's invocation of 50.61(a) at Palisades by pointing out in paragraph 2 of that very same executive summary in the June 2014 WCAP that Palisades' surveillance data "passed all of the surveillance data statistical tests for each

material," that's a quote.

But this ignores that Consumers Energy, which was the owner at the time, categorically repudiated and ignored data in 1983 from destructive testing of capsule SA-60-1.

Entergy, at page -- at, pardon me, footnote 160 of its memorandum in this case, states that that capsule was "inadvertently over-irradiated" in the 1980s. We are not sure what that means.

Westinghouse, in its report, does not acknowledge further the fact that there has been no capsule destructive testing from the reactor pressure vessel at Palisades since 2003, and indeed, that in 2007, a planned further test of a capsule or coupon was waived by the NRC.

Finally, Westinghouse asserts the superficially true statement that "The Palisades RV belt line and extended belt line weld flow density and size distribution are acceptable based on the latest Palisades vessel in-service inspection," that's also known as an ISI, "that results -- that resulted from an ASME Section 11 Appendix 8 qualified examination."

What Westinghouse does not mention in that paragraph number 3 of the executive summary is that the latest Palisades vessel in-service inspection was

in 1995, took place a generation ago, 20 years ago.

The RPV belt line welds have not been scrutinized in the form of a thorough in-service inspection for two decades. They are projected to be examined in December 2015.

These significant facts -- pardon me. These significant facts are quite consonant with the opinion of our expert, Mr. Gundersen, who stated at page 22 of his opinion that at Palisades, more than a decade has transpired since the last capsule coupon was removed and analyzed. So it is impossible to assure that the new analysis proposed by Palisades meets the one standard deviation requirement without removing at least one capsule coupon and performing the requisite destructive testing.

Mr. Gundersen further states on page 22, "Analysis is no replacement for testing the capsule coupon quite simply operating the Palisades reactor without the removal and analysis of the capsule sample for almost two decades," which is 2003 to the projected 2019, 16 year period, that "that seems to qualify the operations of Palisades as a test or experiment under 10 CFR 50.59."

He goes on to point out that essentially, Entergy wishes to be flying blind. We are troubled by

that fact. We are troubled by the fact that there is available scientifically verifiable evidence that is not going to be analyzed, yet at the same time, Palisades, Entergy, seeks effectively to insulate itself from any further publically demanded scrutiny of the status of embrittlement through the end of the 20-year license extension in 2031.

In this morning's battle for the future of Palisades and for the continued health and safety of millions of people living in the Great Lakes Basin region, the Intervenors ask this: that this Panel accept the fact that we have provided an expert report; we have cited evidence and facts which if construed favorably to the Petitioner's point of view, certainly more than warrants a hearing; we have been met by procedural objections, by arguments that we have raised impermissible rulemaking challenges, but we haven't been met by expert opinions. That, of course, is something which would be reserved for an evidentiary trial type of proceeding.

But the point is that the Staff and Entergy have made their strategic choices not to oppose with competing expert opinions. Ours is effectively unanswered in many respects by the other parties.

We believe that a hearing is warranted. We believe that what has effectively occurred here is that the NRC has fashioned a form-fitting regulation that fits only Palisades, and then the parties proceed to object to Petitioners that they are impermissibly attacking that form-fitting regulation.

We hope the Board will see through that and grant the Petitioners a trial on the merits. Thank you.

CHAIR SPRITZER: Well let me ask this before I turn the floor over to Judge Arnold: maybe you can explain to us what you think the scope of our authority is here. You're suggesting that we have the ability or have the authority to direct that they follow 10 CFR -- what is it -- 50.61 rather than 50.61(a) --

MR. LODGE: Correct.

CHAIR SPRITZER: -- am I understanding --

MR. LODGE: Yes --

CHAIR SPRITZER: -- correctly on that?

MR. LODGE: That is correct.

CHAIR SPRITZER: Do you have a fallback argument other than that?

I hope so, because I don't see that we have the authority to do that, so my other Judges,

fellow colleagues, can state their own opinion on that, but --

MR. LODGE: Well --

CHAIR SPRITZER: -- my understanding was you were relying -- Mr. Gundersen has some other arguments that seem to allege that even if 50.61(a) applies, he doesn't think they really applied it correctly in this case. Is that also part of your argument?

MR. LODGE: Yes, and I'm sorry that that did not come out more in my opening --

CHAIR SPRITZER: All right.

MR. LODGE: -- comments.

CHAIR SPRITZER: Okay.

MR. LODGE: Of course it is, yes.

CHAIR SPRITZER: All right.

JUDGE ARNOLD: Okay. Essentially, all of my questions are derived from the petition itself, so the great majority of my questions will be for Petitioner, but I do have some for Staff and Applicant when I need clarification.

My first question is on page 4 of the petition, third paragraph starts out "Petitioners oppose the implementation of the alternative calculation method under 10 CFR 50.61 because there

are grave deficiencies in its mathematical and conceptual underpinning."

Now, that to me sounds like you're saying that 50.61(a) is just wrong in some way, and it looks to me like a challenge of the rule. Is that what you meant to express by that sentence?

MR. LODGE: What we meant to express was -- the sentence is that there are grave deficiencies in the underpinnings that Entergy has provided by way of calculations and projections.

JUDGE ARNOLD: Okay. And -- okay. And then the next sentence is "There has been a dangerously long passage of time since the actual physical testing of the degree of embrittlement," and that is what you were just referring to?

MR. LODGE: Yes.

JUDGE ARNOLD: Okay.

On page 5, let's see, second paragraph, halfway through, "Use of the 50.61(a) calculation approach could, and according to Petitioner's evidence may, cause failure of a critical safety component."

That, to me, also sounds as though you are challenging the rule, but you actually want to say there that it is Entergy's misuse of that rule?

MR. LODGE: Yes. Mr. Gundersen's report

we think clearly says that Entergy's use of 50.61(a) is -- is wrong, that it has been incorrectly undertaken.

JUDGE ARNOLD: Okay. Can you point to anything in 61(a) that is down there as part of the rule that they did incorrectly?

MR. LODGE: The sister plants comparison is one example.

JUDGE ARNOLD: Okay. You say that's -- that's wrong, and I do have questions on that coming up.

My next question is on page 8. Now you say "The switch to the use" -- in the first paragraph, about halfway down, you say quote "The switch to the use of 10 CFR 50.61(a) will change how fracture toughness of the reactor vessel is determined, moving from an analytical to a probable risk assessment model," and I actually want to ask the Staff, is that a correct characterization of the two methods?

MR. LINDELL: Judge Arnold, both rules use a combination of several different things we look at. You're looking at measure data, that's from the surveillance we've drawn from the reactor. There are also projections and calculations based on equations -- equations in the rule.

So -- and in a brief manner, the answer is no, that there is no difference in the rules in that particular regard.

JUDGE ARNOLD: There is a certain amount of empiricism in both rules, meaning that it compares it to data, you're looking at data?

MR. LINDELL: Yes.

JUDGE ARNOLD: Yes. Now the Petitioners have referred to the new method as a probable risk assessment method. Is there any PRA in that method?

MR. LINDELL: Let me just consult with my technical expert for one second.

JUDGE ARNOLD: Right.

(Pause.)

MR. LINDELL: Judge Arnold, both rules have a component that does rely on a PRA.

JUDGE ARNOLD: Now, when I hear PRA, I am thinking a very specific, you do deterministic calculations with branching points and put a probability at each branching point to come up with a number of different outcomes, each having a probability. Is that what you mean? You have a bit of that in each method?

MR. LINDELL: Yes, Your Honor, that is what we mean.

JUDGE ARNOLD: Okay. Which method would you consider to be more rigorous, more accurate?

MR. LINDELL: Your Honor, each -- each method is similar and different, and I would -- I would say that 50.61(a) is based on simply more years of data and more -- and more advanced computer modeling, that the -- when the PTS limits were established in 50.60 and in 50.61 back in 1985, we did not have as much information about the effect of neutron embrittlement on the reactor pressure vessel. Not as many capsules had been withdrawn and things of that matter.

When the rule was published in 2010, and that's 50.61(a), there was a lot more measured data from a whole host of pressurized water reactors. There has also been more -- there have been more computer simulations performed that exactly demonstrate the scope of neutron embrittlement, you know, toward the end of the life of the vessel, so in that sense, 50.61(a) is -- provides more accurate projections about -- about the phenomenon.

JUDGE ARNOLD: Would you say it embodies more knowledge of the embrittlement process in the -- in the 61(a)?

MR. LINDELL: Yes, Your Honor, I would say

that.

JUDGE ARNOLD: Petitioners, anything you want to say about that?

MR. LODGE: Yes. Our position is that Entergy cannot use the 50.61(a) method because rather than use available data, they are extrapolating. 50.61(a) is a tool if real data is available. Entergy is scrupulously avoiding the use of real data.

JUDGE ARNOLD: Okay.

My next question, also on page 8, at the bottom, you have a lengthy quote there -- well, it is two paragraphs, the second paragraph saying "Therefore, the proposed change does not involve a significant increase in the probability or consequence of an accident previously evaluated."

Now, I look at the paragraph you wrote introducing that, and you say it is Entergy's proposed no significance hazards, but the quote itself is from the Federal Register notice, and it's -- it's an NRC document.

So how -- how is it Entergy's proposed determination? I think it is the Staff's determination, isn't it?

MR. LODGE: It is ultimately the Staff's determination, but we believe it is based on Entergy's

conclusion, yes.

JUDGE ARNOLD: Okay.

Well, let me ask you this: would you characterize those paragraphs as the first paragraph gives reasons for the conclusion in the second paragraph? I mean, that is what it appears like to me.

MR. LODGE: Yes.

JUDGE ARNOLD: Okay.

Now the statement of considerations for the 61(a) rule found at 75 Federal Register 22 states, "The final rule would not significantly increase the probability or consequences of accidents."

That seems to me to state the same thing as the last paragraph of this quotation. So it seems to be 100 percent consistent with the statement of considerations for the 61(a) rule. Would you like to comment on that?

MR. LODGE: We would only offer, this, Your Honor, that in 1983, when a significant coupon test that appears to have suggested that there were serious additional embrittlement problems was rejected from the pool of -- of physical data, therefore, the actual data is perhaps skewed a little bit favorably toward the allowance of the reactor to continue

operating.

We believe that advanced computer modeling is not a replacement for our data, which in this instance is available, it's simply not being measured.

The --

CHAIR SPRITZER: Just so I understand, what specific hard data -- is it that you want them to test the sample that they right now are not scheduled to test again until 2019, is that --

MR. LODGE: That is correct, sir, yes.

CHAIR SPRITZER: Anything else besides that?

MR. LODGE: Well, they also skipped a sampling that was slated for 2007.

CHAIR SPRITZER: Is that the same sample or a different one?

MR. LODGE: I think it was a separate coupon.

CHAIR SPRITZER: Okay, so -- all right. I think I understand your position now.

JUDGE ARNOLD: I am going to be having questions later on about the coupon, so we will be getting back to this.

Staff, do you have any comment about the apparent similarity between your no significant

hazards and the statement of the considerations in the rule? They look identical to me.

MR. LINDELL: Judge Arnold, the Staff makes the no -- the proposed no significant hazards consideration determination after evaluating what the licensee submitted in making an independent judgment on that, but what it is saying is that procedurally, it doesn't -- it didn't -- it doesn't appear that there is going to be, you know, a significant impact on -- on public health and safety, and that -- and the rule also did, you know, the Federal Register notice did come to that conclusion, so in that regard, they are -- they are similar.

But what -- but, you know, it's stated in our regulations and in the case law that Petitioners can't challenge that determination in an adjudicatory proceeding. This is -- that is a procedural determination that's outside the scope of what the Board can rule on.

I am not -- I hope I answered your question, I am not 100 percent sure that it did.

JUDGE ARNOLD: Well, I am just -- actually, I am -- I think I am done with that point. I think you have answered my question.

The last sentence on -- the last -- the

last sentence on page 8 says "Entergy concludes that the proposed change does not create the possibility of a new or different type of accident from any accident previously evaluated."

Now, when you -- are you challenging that there will be a type of accident different than an accident previously evaluated?

That question is for Petitioner.

MR. LODGE: One moment, sir, I am sorry.

(Pause.)

MR. LODGE: We are -- we are not saying that it would be a different accident, only that the possibilities of -- of a rupture of the RPV are increased and enhanced.

Also, I think this sort of lapses a bit into the equivalent margins analysis petition, but that is certainly not a -- if the Board wants to discuss it, let's discuss it.

JUDGE ARNOLD: Okay.

On page 9, the last paragraph starts out "Petitioners detail below their position that the analysis provided to the NRC by Entergy is inadequate and relies upon unsupported assumptions."

Now, are you saying that it's inadequate because it relies on unsupported assumptions, or are

there two claims there: it is inadequate and it is based upon unreliable assumptions?

MR. LODGE: The former.

JUDGE ARNOLD: Okay, it's a cause and effect, great.

On page 10, second paragraph, the last two sentences, basically, 10 CFR 50.61(a) allows Entergy to substitute various estimates of the status of the RPV for actual data investigation and analysis.

Does it explicitly -- can you tell me where in 50.61(a) it explicitly says that they don't have to have actual data, but can instead substitute analysis, or is it more subtle than that?

MR. LODGE: I believe it's more subtle than that.

50.61(a) is set up on three data points that -- that involve, at least as to I think two of them, projection, whereas 50.61 relies on -- on scientific validation metal testing.

I might also point out that, in light of the Belgian study that we cited in our reply, that the -- there is the additional problem here that the coupons themselves actually are rather a conservative measure, albeit they are physically -- they would provide physical data from destructive testing.

Yes, they are effectively an underestimate because the reactor pressure vessel itself is under pressure as well as of course heat and the other features of plant operation. The coupons are simply passive objects within the RPV.

JUDGE ARNOLD: Now the very next sentence, "The 50.61(a) projections are attained, among other means, by averaging data on reactor vessels from other nuclear power plants to arrive at a projection of the current status of the Palisades RPV."

Now, when you take -- say that, are you referring to the comparison -- let's see -- in 50.61(a), (f)(6)(1), where, let's see, "The licensee shall evaluate the results from a plant-specific or integrated surveillance program," and if they satisfy these criteria, you basically compare them against the predicted trend. Is that basically what you're talking about here?

(Pause.)

MR. LODGE: I am not sure if this answers your question, but the reactor vessel comparison is, we think, extremely weak. The reactors to which Palisades is being compared are not even of the same type. There are certainly metallurgical differences, and I would say that there are probably pressure and

heat and process kinds of differences of that sort.

We think that there -- as Mr. Gundersen pointed out in his report, there is also a problem in trying to match the standard deviation bands among the four comparison reactors, including of course Palisades.

JUDGE ARNOLD: I am just trying to determine, this comparison that you're talking about, it's the one from (f)(6)(i)?

MR. LODGE: I don't have the regulation open. I believe that is the sister plants --

JUDGE ARNOLD: Why don't we pass -- here is 51(a), or 61(a). Pass that down to him, if you wish. Can you?

MR. LODGE: Thank you.

JUDGE ARNOLD: If you look at the seventh page of that, and that is freshly printed off from the NRC's webpage --

MR. LODGE: Yes.

JUDGE ARNOLD: Seventh page, second paragraph, where it says (i), that is (f)(6)(i).

MR. LODGE: Right.

JUDGE ARNOLD: And that is the only place I could find in the rule where there was a comparison that could be using other plants.

MR. LODGE: I am sorry, in -- so your question again sir --

JUDGE ARNOLD: I -- you keep saying that there is a comparison using data from other plants. Now, if it's in the application, then it's probably required somewhere by 50.61(a), and I am trying to find out if that's the paragraph that requires that comparison.

MR. LODGE: Your Honor, I would be -- I don't recognize that as being the reference to the requirement of sister plant data. I might be able to find it if we -- during a break.

JUDGE ARNOLD: Let me ask Staff, are you familiar enough with the rule to know if there is any comparison in -- in 61(a) other than this (f)(6)?

MR. LINDELL: (f)(6)(i) is indeed where we require the applicant to use that provision to -- to provide data from other plants if certain criteria are met, and it lays out the criteria there.

I can -- I was planning on explaining at greater length --

JUDGE ARNOLD: Okay.

MR. LINDELL: -- works. I don't know when you would like me to do that.

JUDGE ARNOLD: Later.

MR. LINDELL: Okay.

JUDGE ARNOLD: Okay.

Okay, I am going to surmise from my own reading of 61(a) and the Staff's opinion there that that is the comparison that your petition is referring to.

Going on, on page 10, the last full paragraph, "Petitioner's position is that Palisades has an acknowledged problem of worsening reactor vessel embrittlement, commencing from the start of operation in the early 1970s."

Let me just ask Entergy if -- if it is true that you have had worsening embrittlement since the beginning of plant operation.

MR. KUYLER: We don't agree with that statement, Your Honor.

JUDGE ARNOLD: You don't? Hmmm. I -- I personally have to say, as a nuclear engineer, I am surprised with that because I think that's a statement that probably applies to every reactor vessel that has ever had a neutron hit it.

Let me ask the Staff, do you -- you agree every plant undergoes embrittlement?

MR. LINDELL: Yes, Your Honor, every plant does undergo embrittlement over time, and, you know,

one of the things that 50.61 and 50.61(a) are there for is to address the issues with embrittlement over time.

JUDGE ARNOLD: So -- so the Petitioner's statement is true for every reactor vessel?

MR. LINDELL: Yes. I would just say that worsening embrittlement doesn't necessarily mean unsafe operation.

JUDGE ARNOLD: Thank you.

On page 11, top paragraph, first full sentence, "They," referring to Petitioners, "further raised the question of whether Entergy should be allowed to resort to 50.61(a) at all."

Now, it seems to me that 50.61(a), paragraph (b) on applicability, states -- basically says the requirements for using 61(a). Are you saying that the Palisades do not fulfill that paragraph on applicability, or are you saying there is something -- well, answer that question, does the Palisades Plant fulfill the applicability requirements of 51(a)?

MR. LODGE: Of 50.61(a)?

JUDGE ARNOLD: Yes, 61(a).

MR. LODGE: It -- the problem to us is that there -- there isn't a threshold, there isn't a limbo stick over which Entergy must leap to qualify to

use 50.61(a).

The only reactor with a -- with a 50.61(a) application pending is that of Palisades.

This is -- this returns to the point we made in our opening statement about there's a form-fitting rule, and -- and Palisades is it. Palisades is applying, it is an option that's available. We believe that this Board has the discretion to find that there has not been compliance with either 50.61 or 50.61(a).

JUDGE ARNOLD: Let me just ask the Applicant here, does the Palisades vessel meet the applicability requirements for 50.61(a)?

MR. KUYLER: Yes it does, Your Honor. That is what our license amendment request shows.

JUDGE ARNOLD: Okay.

Further on in that same paragraph, the petition says "Entergy plans to substitute the estimate procedure of 10 CFR 50.61(a) for a scientific rigor implicated by 10 CFR 50.61 despite the availability of scientifically measurable coupons."

Let me ask Petitioner, would application of the analysis in 50.61 require that a coupon be removed right now?

MR. LODGE: We believe that it would, that

they would -- that the utility would have to provide a scientific or data-based reason for pushing back the goalposts.

JUDGE ARNOLD: Let me ask Staff, would 50.61 require a coupon removal right now?

MR. LINDELL: Your Honor, are we talking about 50.61 or 50.61(a)?

JUDGE ARNOLD: 61.

MR. LINDELL: No, Your Honor, the 50.61 does not require that.

The schedule for the withdrawal of reactor coupons is in actually 10 CFR Part 50 Appendix H, and that sets out the requirements for when and how those coupons are withdrawn.

JUDGE ARNOLD: Thank you.

Let's see. Still on page 11, the first paragraph under section IV.A., "Petitioners claim that the Palisades" -- "The NRC" -- let's see, "The licensing framework that the NRC is applying to allow Palisades to continue to operate until August 2017 includes both non-conservative analytical changes and mathematically dubious comparisons to allegedly similar sister reactor vessels."

Now question for Petitioners, can you point to any rule that says that when there is

excessive conservatism, it can't be removed from an analysis?

MR. LODGE: We believe that the Atomic Energy Act requirement of adequate assurance of reasonably -- of reasonable safety is the standard that the NRC is required to enforce.

JUDGE ARNOLD: Thank you.

MR. LODGE: Incidentally, Your Honor, we also disagree that there is excessive conservatism. I think that's almost oxymoronic here. There must --

JUDGE ARNOLD: Well, let me quote from the statement of considerations for the rule. It states that the rule, that's 61, "The existing requirements are based on unnecessarily conservative probabilistic fracture mechanics analysis," that's right from the statement of considerations, so you're basically, in that statement, you're kind of -- to me, it sounds like you're contradicting what the Commission published, so do you have any justification for saying that the Commission is wrong?

MR. LODGE: First of all, Your Honor, I am not sure that that is -- what you're referring to is a formal finding by the Commission itself as opposed to the Staff.

Secondly, as -- as a member of the

potentially affected public, I guess I am a little bit troubled by the creeping in of this excessive conservatism kind of talk because we believe that conservatism is -- is prudent and is a requirement under the Atomic Energy Act.

JUDGE ARNOLD: Now, talking about the mathematical dubious comparisons to allegedly similar sister reactor vessels, let me just ask Entergy, how do you choose these comparison sister reactor vessels?

MR. KUYLER: The -- the rules, Your Honor, required Entergy to identify those plants that had similar materials, and those are the materials that Entergy tested.

JUDGE ARNOLD: Okay. And your -- these comparisons meet all the requirements specified in the rule?

MR. KUYLER: That is correct, Your Honor. The -- that data met the statistical comparison tests in 50.61(a).

JUDGE ARNOLD: Okay.

In -- in the -- in the comparison of -- in 61(a),(f)(6)(i), that you're doing, does it permit you to -- to narrow down the base of comparison -- what, vessels, for any -- on any other basis? Can you pick and choose?

MR. KUYLER: No, it does not, Your Honor. The text of the regulation is very clear. If the data is available, we must use it.

JUDGE ARNOLD: Thank you.

And on page 11, the petition for the first time brings up the equivalent margins evaluation.

Let me just ask, do you want to pursue that in this petition, or do you just want to let it go into the new petition that's been filed?

MR. LODGE: We believe it -- we believe it goes into the new petition.

JUDGE ARNOLD: Okay. That will -- that will reduce my questioning.

(Pause.)

JUDGE ARNOLD: Let -- I have a bunch of questions on coupons, and I think rather than ask them right now, since they are more questions towards Entergy, I will wait until later.

In the middle of page 12, let's see, third paragraph, about halfway down, "Gundersen notes that 50.61 is analytical in nature, while 50.61(a) authorizes probable risk assessment."

Let me just -- Staff, we -- from what you've said earlier, you would not exactly agree with that?

MR. LINDELL: Correct, Your Honor, we would not agree with that.

JUDGE ARNOLD: Okay. Let me ask then Petitioners, do you believe that that characterization is correct, that 50.61 is analytical and 50.61(a) uses probabilistic risk assessment? Do you stand by that?

MR. LODGE: We stand by it, and while even conceding that there is some PRA implication in 50.61, we believe that 61(a) allows forays considerably further into that thicket.

JUDGE ARNOLD: Okay.

On page 13, the first paragraph, towards the end of that, you're talking about the -- having to do with -- let's see, the weakening of the pressurized thermal shock criteria, you state that "More than four decades of regulatory retreat is seriously endangering the public," and do you have -- do you have support that these have not just been reducing excessive conservatism, but have actually increased the chances of some sort of accident?

MR. LODGE: The -- the end of life dates that keep retreating, vanishing into the future, are what is of concern to me. I mean, that is what we consider to be regulatory retreat because each of those means that -- that there is more damage that has

occurred, that there is more deterioration.

And again, the -- the Belgian RPV study that -- that Greenpeace has publicized certainly suggests that with new technology, which the NRC readily credits with allowing the -- with the name-calling of excessive conservatism, we also believe that new technological means of assessing the reactor metal suggest that there is micro-cracking that was not before this time recognized as a problem, and it is possibly a big problem when serious nuclear engineers are recommending examination of every reactor on the planet.

JUDGE ARNOLD: Okay, but my question is do you have specific analysis or something definitive to go on, or is this looking at well we know embrittlement causes the vessel to get more embrittled, we know they're extending the life, so it makes sense that they're coming closer to an accident?

MR. LODGE: Yes, it's -- correct, yes, that's -- .

JUDGE ARNOLD: Page -- same page, 13, third paragraph.

Oh, I -- I -- quote, "The nuclear chain reaction inside the reactor that is created to generate electricity from high-energy electrons also

creates neutrons that impinge upon the inner side of the steel reactor vessel," and I had hoped that Mr. Gundersen would be here so that he could explain the role of high-energy electrons in a fission process.

I hope that this is a -- that he made a mistake in -- in drafting this --

MR. LODGE: Actually, that's -- that's the product of a political science major lawyer, Your Honor.

JUDGE ARNOLD: Okay.

And the last paragraph, on page 13, now you start off talking about the reference temperature-nil ductility transition temperature was 40 degrees at the beginning of life, and further on into the sentence, you talk about the screening criteria weakening to 200 degree Fahrenheit, and I want to -- want to make sure I understand this: you're talking about the actual referenced transition temperature, and you're talking about a screening criteria, and those are two different things, right?

MR. LODGE: Yes.

JUDGE ARNOLD: Okay.

And on page 14, the first sentence, you refer to "Notably, 200 degrees Fahrenheit was merely an earlier stage of the retreat from regulation."

The 200 degrees came about as a change in the regulation, wasn't it, or -- I am trying to understand what a retreat from regulations means.

MR. LODGE: We're dealing with what has generally been acknowledged to be the first or second most embrittled reactor in North America, and we see no shutdown, we see a -- what appeared to be a promise that annealment would be the considered remedial option years ago abandoned, and we see the standards vanishing into the future that would require a shutdown and serious consideration of what to do about the embrittlement.

This is a very dangerous reactor situation. It's a very problematic reactor, and the science is starting to catch up even more.

JUDGE ARNOLD: Okay, so when you use the phrase retreat from regulation, you don't mean a violation of regulation --

MR. LODGE: No.

JUDGE ARNOLD: -- and you're not talking about getting further from the regulatory limit.

MR. LODGE: Well, the regulatory limit is moving away from the facts --

JUDGE ARNOLD: Well --

MR. LODGE: -- on the ground.

JUDGE ARNOLD: Okay, it's a retreat of the regulation.

MR. LODGE: Yes.

MR. LINDELL: Your Honor?

JUDGE ARNOLD: Yes.

MR. LINDELL: May I just say something with regard to the 200 degrees, or --

JUDGE ARNOLD: Yes.

MR. LINDELL: There -- the screening criteria in 50.61, since the rule was promulgated in 1985, have always been the same: 270 degrees Fahrenheit for some materials and 300 degrees Fahrenheit for others.

The -- the reference to 200 degrees Fahrenheit is something from a separate document that is unrelated to pressurized thermal shock.

JUDGE ARNOLD: My next question is for you, since this is what the Petitioner said: "Palisades has gained notoriety at the NRC for being one of the nation's most embrittled reactors."

Do you keep a list of notorious plants?

I am -- is this a valid statement in some way?

MR. LINDELL: We have -- I mean, we have a reactor oversight process where we look at, you

know, which plants require further inspection scrutiny and which require less, but I don't believe there is anything -- any list of notorious plants particularly relating to embrittlement.

And there -- you know, different plants have different embrittlement levels. Palisades has a certain level of embrittlement, and other plants have similar levels of embrittlement.

JUDGE ARNOLD: Okay. Let me ask Petitioner, what exactly do you mean by this phrase then?

MR. LODGE: Your Honor, if the NRC isn't keeping a list of most embrittled, it ought to be.

The NRC expert, Mr. Kirk, himself has referred to Palisades as a special reactor.

A 2013 NRC webinar slide suggests that -- is it Point Beach? Unit 2 of Point Beach, almost directly across Lake Michigan, and Palisades are vying for worst embrittled reactor.

The -- if they aren't keeping a list, they certainly need to start.

JUDGE ARNOLD: Okay. Would it -- would it be fair to say -- well, I understand that the 61(a) rule was developed partially on the basis of the Palisades reactor vessel, so would you say Palisades

is of special interest to the NRC where embrittlement is concerned?

MR. LODGE: Yes, and has been for a considerable period of time.

Your Honor, we are -- we would concede the possibility that destructive testing might show that there has been some sort of plateau, some sort of halt, some slowdown to the embrittlement problem at Palisades, but the problem is we're talking about data which is readily available if there were the will to do the testing. There is not the will to do the testing. That should raise all kinds of red flags because we're talking about not testing for well over a decade.

And incidentally, I might point out, in 2007, when the coupon test was waived by the NRC, we wonder if that wasn't in fact because the embryonic rule 50.61(a) was being drafted or circulated and was finalized in 2010, I believe.

So we wonder if the idea wasn't to avoid doing a coupon test and ductile testing in order to not have that data available, in order to allow Palisades as the only reactor so doing to avail itself of the new rule once it became a new rule.

JUDGE ARNOLD: Okay.

On page 16, the first full paragraph on the page, starting midway through the sentence "Gundersen also finds that the failure of the licensee to install a thermal shield before the reactor become operational would have avoided the problem altogether."

Now, do you know if he has done some sort of calculation to back that up, or is that just based upon his general knowledge?

MR. LODGE: I believe it is based on his general knowledge, not on calculations, but certainly, a scientific -- a mention of a potential contributing factor to the unusually embrittled nature of this RPV.

JUDGE ARNOLD: And middle of that page, just under the heading "2. The Comparable Plants," "Gundersen objects to the identified comparable nuclear reactor vessels."

Do you have some other alternative way of selecting comparable, or are you just saying comparable shouldn't be permitted?

MR. LODGE: We believe comparables should be comparable, they should be the same type of reactor, the same generation, as much as possible, a matchup of the metals, that sort of thing.

JUDGE ARNOLD: In -- in the rule itself,

61(a) rule where it says to do this comparison, do you know of any selection criteria based upon the vessel designer, the vendor, the manufacturer?

MR. LODGE: No.

JUDGE ARNOLD: Okay. So it was an oversight of the rule, or the rule just wasn't specific enough?

MR. LODGE: The rule wasn't -- certainly isn't specific enough.

CHAIR SPRITZER: All right, why don't we take a 10-minute break at this point, and we'll resume, be back here at about 11:16.

(Whereupon, the hearing went off the record at 11:06 a.m. and resumed at 11:20 a.m.)

JUDGE ARNOLD: Okay. On Page 17 of the Petition, Gundersen says, such false comparisons significantly dilute Palisades' embrittlement calculations.

And I'm just wondering what's that supposed to mean, diluting a calculation.

MR. LODGE: I'm sorry, sir. I don't see that.

JUDGE ARNOLD: Very top line on Page 17.

MR. LODGE: Oh, all right. Just a moment, please.

(Pause.)

MR. LODGE: The sister plant's comparisons actually help Palisades. The relatively unremarkable data from the sister plants when averaged with the very remarkable data from Palisades, assists - puts a good face on the situation at Palisades. That's what we mean.

DR. ARNOLD: Now, this is where the petitioner starts going into a claim that further operation would basically be a test.

And looking over 10 CFR 50.59(a)(6) defines what a test is. Tests or experiments not described in the Final Safety Analysis Report means any activity where any structure system or component is utilized or controlled in a manner which is either; one, outside the reference bounds of the design basis as described in the Final Safety Analysis Report, or; two, inconsistent with the analysis or description in the Final Safety Analysis Report.

Using that definition, how does continued operation constitute a test?

MR. LODGE: Our perspective is that this is in its own way a grand experiment where Palisades is going to be operated either to an end that doesn't become a disaster, or an end which does.

And this is an unprecedented situation where you have multiple rule changes to favor one particular reactor and those rule changes consistently reflect a worsening metallurgical problem that goes unremediated even though there are means of verifying the precise status, as well as fixing that problem. And neither of those things are happening here.

We think that that certainly suggests that the Great Lakes Basin population is being subjected or witnessing an ongoing experiment, and a very dangerous one.

JUDGE ARNOLD: Okay. If this were deemed to be a test, then 50.59 would require there be a license amendment requesting permission to do that test.

Well, there's already a licensing amendment request in. So, would this just amount to changing that to -- from being a license request for 61a to a licensing request for 61a and a test? I mean -

MR. LODGE: I'm not sure, Your Honor, that the - we aren't necessarily calling for some sort of designation by license amendment.

We're pointing out that there is a remarkable absurdity here. And that is that this

circumstance seems to fit the criteria or the definition for a test or experiment, and yet it is not being recognized as that by official NRC activity.

JUDGE ARNOLD: Okay.

MR. LODGE: I understand that there's some fine distinctions between 50.59 and this situation. And we also recognize that the Board is taking a very legalistic view of the circumstances here.

We understand that well, but this is a remarkable and a truly unique, exceptional reactor with problems that are not being properly recognized within the regulatory arena.

JUDGE ARNOLD: Let me just say because you've put this argument in here, it's something that we have to address.

MR. LODGE: Sure.

JUDGE ARNOLD: And we have to consider whether this is a claim that there has to be a license amendment for a test, but from what I'm hearing now you're not specifically saying that there has to be another additional license amendment saying it's okay to do this test.

MR. LODGE: Well, we think that the role - one of the roles that the Board could fulfill here is to call this what it is.

We have a situation where it's 20 years since the last ISI. It's 12 years and will be 16 if you go through 2019 before there's a coupon pulled and tested.

This is a truly egregious situation and it is - we're talking about circumstance where there is data that could be culled and it is not being - and it is not being examined, it is not being used in any scientific analysis.

JUDGE ARNOLD: Okay.

CHAIR SPRITZER: Can I ask one question?

JUDGE ARNOLD: Sure.

CHAIR SPRITZER: Let me clarify. Is it possible in your understanding of law, of the regulations, if Palisades meets the 50.61(a) criteria as Entergy claims in its license amendment and the staff appears to agree, if it meets those requirements, could it possibly be a test?

I understand you dispute whether it meets those requirements, but let's say if we were to assume that it does meet 50.61a, is there really an issue about it being a test reactor?

MR. LODGE: Mr. Gundersen opined, and I agree, that it still amounts to a test or experiment even if it meets the - and incidentally, Your Honor,

that is a fact issue that we would be more than happy to explore at a trial.

I'm not trying to be evasive, but this is exactly why we believe that you can see that there is - there's some very troubling evidence here. And there is certainly a strong suggestion by our expert that there are problems with the calculations, there are problems with the mix of calculations used to achieve 61a compliance, which we don't believe is a valid conclusion.

CHAIR SPRITZER: I was only asking about a legal question.

MR. LODGE: Sorry.

CHAIR SPRITZER: That is, could there legally be a situation where a reactor is operating as a test if it - with respect to embrittlement if it meets the 50.61a criteria? But I think I understand your answer.

JUDGE ARNOLD: The second half of Page 18 starts getting into the topic that involves one standard deviation and 20 percent between all the data. And it's not clear to me what the one sigma and 20 percent are used for.

Could you explain that where these numbers come from and what they're used for?

MR. LODGE: Your Honor, we believe that Mr. Gundersen did explain those. And in a way, there's perhaps a problem taking the word of an attorney who is marshaling things for argument using the expert's opinion as opposed to simply trying to make a determination as to what the expert himself is saying.

I don't mean to be evasive, but I believe that Mr. Gundersen laid out the problem with the standard deviation. This gets into the difficulty of comparing the cross-comparisons of sister plants.

The sigma deviation, however, is a Westinghouse standard. It's in the - I think the 2010 wCAP report.

JUDGE ARNOLD: Does it occur in any NRC regulation, the one sigma or the 20 percent?

MR. LODGE: The 2010 WCAP or the 2010-2014 WCAPs, 2014 is the basis for the application under 61a.

JUDGE ARNOLD: Okay. Because I'm still confused about this let me just ask staff, do you know if there is anywhere in the rules that refers to this one sigma or 20 percent?

MR. LINDELL: Your Honor, let me try to explain this. The number, the 20 percent number, the

one sigma comes from Regulatory Guide 1.190.

And what it's being used for over there is - it has to do with comparing the projected fluence levels in the steel based on calculations with the data that's - the collected data from the surveillance capsules.

So, when we're looking at one particular location on the reactor belt line and we're looking at the - comparing the fluence levels between the calculated and measured data, there shouldn't be more than a 20 percent difference.

It doesn't have anything to do with comparisons between sister plants and different data points there.

Doesn't even have - it's not even related to comparing different locations on the reactor belt line because, you know, depending on how close a particular point is to the fuel there's going to be more fluence or less fluences further away. So, the 20 percent standard deviation really wouldn't make sense there.

CHAIR SPRITZER: Just to follow up on your answer, Mr. Lindell, you said it's for comparing the calculated, that is the modeled numbers for Palisades, versus actual data, I presume, from capsules at

Palisades.

Am I understanding you correctly?

MR. LINDELL: Yes, Your Honor. That's -

CHAIR SPRITZER: But it doesn't apply to comparisons between either modeled or actual data at Palisades on the one hand, and data from other plants on the other hand.

MR. LINDELL: Yes, Your Honor.

CHAIR SPRITZER: Okay. That's also - I interpreted that to be Entergy's position based on their filing.

Is there anything you can point me to in the Regulatory Guide itself or 50.61a to give us a reference point?

It seems essentially an interpretation of the regulations, but what would you rely on to support that?

MR. LINDELL: I don't have the particular citation to that point in the Regulatory Guide in front of me right now. As we progress, I can obtain that and we can discuss it.

CHAIR SPRITZER: Well, we're obviously asking you questions before you've had a chance to make your -

MR. LINDELL: But I will, you know, get

with my expert and we'll look for -

CHAIR SPRITZER: Okay.

MR. LINDELL: We'll get that information.

CHAIR SPRITZER: Great. Thank you.

MR. LODGE: If it may please the Board, I just would like to point out that again we're talking about an expert argument here which is best resolved at trial, I hope.

CHAIR SPRITZER: Well, not my questions at least. I'm trying to focus on the regulations, what they require and what they don't require.

Mr. Gundersen while you're right, he may -- he submitted a declaration. Some of his declaration seems to be based on requirements that he believes exist, and I'm trying to find out whether he's right or not.

Entergy and staff say, no, this -- what is it -- 20 percent at one standard deviation requirement really doesn't apply when you're doing the surveillance data or so-called sister plant in comparison.

That's really at least, in part, sounds to me like a legal question or a question of interpreting the regulations, and that's something we have to resolve now.

I agree that if there's a factual dispute of whether that test - if we assume that test applied and he's saying it isn't met, and staff and Entergy are saying, yes, it is, that would be a dispute between experts.

What I'm having - what I'm trying to understand, though, is was he correct in assuming that there is such a requirement. Go ahead.

JUDGE ARNOLD: Okay. The last paragraph on Page 18, Mr. Gundersen starts discussing the neutron flux in the various sister plants and the variation in the new - in the flux, but I notice that nowhere did he claim that the neutron flux makes a difference to embrittlement. And to my knowledge, it doesn't.

So, what is the relevance in the variability of the flux?

(Discussion off record.)

MR. LODGE: We think it's fundamentally a truism that the more neutron flux that falls upon a certain area, that the -- greater the changes of embrittlement or the actual embrittlement that will result.

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

JUDGE ARNOLD: Well, the flux is just the rate at which the fluence is changing. So, and the fluence, they have to have three different fluence points. And the comparison is a plot versus fluence.

So, since the rate doesn't seem to make a difference, I'm wondering why he has that comparison.

MR. LODGE: Flux is a key ingredient in embrittlement. And we think that the fluency, that flux essentially drives fluency.

JUDGE ARNOLD: Okay. On Page 19 you start - you have the discussion of the capsule that wasn't - the results were not used.

And you say, from this evidence, Gundersen deduced that this particular sample was discarded precisely because it gave an answer that would have required Palisades to shut down.

Now, that seems to be at odds with the quoted paragraph which says, basically the capsule results were disregarded because the fluence was far greater than will ever be experienced in the vessel.

So, do you have some way to really make those two statements possible to coexist?

MR. LODGE: We think that the intervening 32 years suggests that data like that should not have been so readily dismissed and repudiated especially

since the owner of the plant is now in a period where it doesn't believe that any more data should be gathered.

And of course there is, as we've mentioned before, the Belgian RPV study which suggests that there's a microcracking phenomenon because of an interaction with hydrogen atoms. So, there's new scientific information.

(Discussion off record.)

CHAIR SPRITZER: This Belgian study that you just referred to, Mr. Lodge, is that referred to in the Petition?

MR. LODGE: It's in our January 20th, reply filing, sir.

CHAIR SPRITZER: Okay. All right. Thank you.

JUDGE ARNOLD: Now, is that of the same heat material, or is that of a different material altogether?

(Discussion off record.)

MR. LODGE: The Belgian experts suggest that all reactors be examined, because they have identified a problem with hydrogen atoms embedding in cracks as a process - as a result either of the formulation process, or the operation of the reactors.

JUDGE ARNOLD: Okay.

MR. LODGE: Thank you.

CHAIR SPRITZER: Mr. Lodge, on the question of what we call sister plant data or surveillance data that's used under 50.61a(f)(6), if there is no surveillance data for a particular heat or metal type, then a consistency check with the embrittlement model isn't required.

Are you saying that there is no surveillance data that can appropriately be used for this consistency check because of the issue that Mr. Gundersen refers to in his declaration?

MR. LODGE: I would say that there's no surveillance data -

JUDGE ARNOLD: Microphone, please.

MR. LODGE: I'm sorry. Please ask that again, just the last part of your question.

CHAIR SPRITZER: I'll try to simplify. Are you saying that there's no surveillance data that could appropriately be used for the comparison -- that could be used as surveillance data under 50.61a(f)(6)?

MR. LODGE: Well, Palisades' own capsules are not being used for comparison with its - with its present perceived state, its projected condition.

CHAIR SPRITZER: No, I understand that.

But as to the sister plant data, I'm trying to understand what you think, how you're claiming the analysis should be done.

Should they just throw out the surveillance plant data for the reasons stated by Mr. Gundersen?

MR. LODGE: Yes - well, what we're saying is, is that Palisades is so unique and so special that there effectively are no very valid sister plants to which it compares. Perhaps Point Beach Unit 2, but obviously that wasn't part of the comparison.

That's my answer.

CHAIR SPRITZER: And the problem that that seems to create is, if I'm understanding the regulations correctly and the staff and Entergy can correct me if I'm mistaken, but the regulations say if you don't have surveillance data, you just use the model without the surveillance data.

It seems a little odd that the default for lack of useful empirical data is to use the model anyway without the ability to compare it to surveillance data, but that seems to be what the regulations say.

So, doesn't that create something of a problem for your argument? They would just use the

model anyway if the surveillance data is no good, if I'm reading the regulations correctly.

MR. LODGE: It certainly suggests that the sister plant comparison is rather bogus, yes. We're looking at a situation where in the weld material that is at Palisades, perhaps a two percent copper and one percent nickel content. And that's a serious variance so far as we know from the comparables that were used.

CHAIR SPRITZER: Uh-huh.

MR. LODGE: The welds are in many respects perhaps the most dangerous or problematic area of the RPV at Palisades. And so, sure, throw out the sister plants.

It seems to me that scientific rigor and prudence then suggests that you go with available scientific data that's ready at hand.

It's a broken record, but this is a - this is a ridiculous situation where the petitioners are in the position of saying, do what's reasonable here, what reasonably assures protection of public health and safety. And we believe that that requires some fairly tight compliance with 50.61.

61a is the Palisades rule.

CHAIR SPRITZER: Can you give me an explanation - so, you're saying you want the Board to

order them to do some additional testing at Palisades.

I think you told me earlier that would include the 2019 - the capsule currently scheduled for testing in 2019. And there was one other that you say they -

MR. LODGE: '07.

CHAIR SPRITZER: Okay. Can you explain to me what legal authority you believe the Board - the basis of your argument that the Board has the legal authority to require that?

MR. LODGE: Well, we think the Board has legal authority to disapprove the 61a application and perhaps force some reconsideration, therefore.

CHAIR SPRITZER: Because they didn't do this - these tests, these two additional capsules that you're referring to?

MR. LODGE: And the other considerations. The essentially invalid nature of the sister plants comparison.

CHAIR SPRITZER: Could they use a sister plant comparison under your argument as long as the spatial or other forms of neutron variability that Mr. Gundersen referred to is accounted for in the analysis?

MR. LODGE: They can always do a sister

plant comparison. They can do a better one than was done. And that better one might - we are rather confident would reveal that Palisades is an outlier, but essentially the problem does evolve to why is there no coupon testing being done as a top priority, why is that not the basis for the decision to either stick with 50.61 or move to 61a and that there's no answer here being given by the utility.

They're simply saying, we don't have to do it. It's a choice.

CHAIR SPRITZER: This Capsule A-60 that's referred to - let's see. This is on Page 19 of the petition.

MR. LODGE: Yes.

CHAIR SPRITZER: The quoted language in the middle.

Do you know at any point in the history of Palisades, was any testing done on that capsule, or was it just left in the reactor?

MR. LODGE: You're talking about the 1982-83 - Capsule A-60 is the -

CHAIR SPRITZER: Yes, I know. As of October 31, 1982, the licensee indicates that capsule A-60 -

MR. LODGE: Right.

CHAIR SPRITZER: -- had accumulated a certain amount of neutron fluence. That's the statement that's in the middle of Page 19 that's quoted.

I'm trying to figure out what happened to that capsule. Do you know?

MR. LODGE: No. All we know is what we have seen in these -- in the documents cited in our pleadings.

CHAIR SPRITZER: Okay. All right. So, if I understand what you're telling me now, it's that you're not necessarily objecting or saying that there's no surveillance data anywhere that could be used.

You just don't think the data they've used is adequate for the purpose that it was used.

MR. LODGE: Correct.

CHAIR SPRITZER: Okay.

MR. LODGE: And we do believe the Licensing Board has the power to look at what is being - what information is filling in the blanks and decide if that represents a bonafide, valid approach or provision of data especially taking into account the overall circumstances and the mission which we believe is to enforce conservatism with such a delicate

situation.

CHAIR SPRITZER: Okay. All right. We've talked about the surveillance data.

Can you tell me is there any other respect, any other specific respect in which you are claiming that Entergy failed to comply with 50.61a?

MR. LODGE: Other than the things that are cited in Gundersen's report, no.

CHAIR SPRITZER: Okay. All right. That, as I understand Mr. Gundersen's report, he has a dispute with what we've talked about whether the surveillance data is - was appropriately used and whether it's - whether it's appropriate to use.

He also takes issue with the sister plant comparison. That seems to essentially be the same argument.

That's basically what I've gotten out of his declaration. He just doesn't think they used the correct surveillance data.

Is there anything I'm missing?

MR. LODGE: No. I think what you see is his position and ours.

CHAIR SPRITZER: Okay. All right. If you look at Paragraph 35 of Mr. Gundersen's declaration, it references chart 2.2-4 which is about flux.

Do you know whether - and if you don't know, just tell me you don't know, but did Mr. Gundersen mean to reference chart 2.2-5 which is actually about fluence?

He says fluence decreases over time. So, I assume he's talking about fluence, and not flux. Maybe you can explain to me how he got from that chart, 2.2-4, to his conclusions about fluence.

MR. LODGE: One moment, sir.

(Pause.)

MR. LODGE: At this point, I don't know.

CHAIR SPRITZER: All right. I think that's all I have.

JUDGE HIRONS: I'll wait until the applicant -

CHAIR SPRITZER: Okay. All right. As we said, we'll give you - well, you didn't really use all your 13 minutes. So, we'll give you five minutes for rebuttal, but that will be at the end of when everyone else is finished.

So, why don't we move on and hear from Entergy. Entergy, you have, if you choose to use it, a 10-minute opening statement. And then we'll follow up with any questions.

MR. KUYLER: Thank you, Your Honor. Ray

Kuyler for the applicant. Good morning, Judges Spritzer, Arnold and Hirons, and may it please the Board.

On behalf of Entergy, I appreciate the opportunity to appear before you this morning. And for the reasons thoroughly discussed in Entergy's and the NRC staff's briefs and as we'll discuss further today, the Board should deny the Petition in its entirety.

When counsel for the petitioners paints the issues as an issue of rigor versus conjecture and science versus speculation, what we have is simply an impermissible collateral attack on the 2010 alternate pressurized thermal shock rule, Section 50.61a.

Without rehashing the briefings, I'd like to emphasize just a few points. First, through NRC-approved license amendments and safety analyses, Entergy has previously demonstrated that the Palisades reactor pressure vessel is safe today with adequate margins of safety and that fact is not subject to challenge in this proceedings.

Second, Entergy's pending license amendment request shows that the reactor pressure vessel will continue to be safe from pressurized thermal shock events for the remainder of the plant's

license life.

And Entergy makes that showing through a Westinghouse analysis that uses the methods set forth in the regulation, Section 50.61a.

The validity or technical soundness of the rule is not subject to challenge in this proceeding. And I believe most of our conversations so far this morning has been on the validity of the rule.

Third, the Petition focuses on these matters, these very matters which are outside the scope of this proceeding.

In fact, neither the Petition nor the Gundersen declaration makes a single reference to the actual Westinghouse report that was submitted with the license application to show compliance with Section 50.61a.

Instead, petitioners allege the use of Section 50.61a at all is a deviation and they challenge the Appendix H reactor vessel surveillance capsule schedule which the NRC approved in 2007.

And although they seem to have taken this off the table, they also challenge the equivalent margins analysis license amendment, which is the subject of a separate request for hearing.

The Petition and the Gundersen declaration

also appear to misunderstand and mischaracterize the requirements of Section 50.61a and the technical analysis that Entergy presented in its license amendment application. So, their critique is unsupported and also fails to raise a genuine dispute.

Fifth, and finally, petitioner's reply is largely non-responsive to the objections that Entergy and the NRC staff have made. Their reply simply misses the mark and we believe that the oral argument that petitioners have presented this morning also misses that mark in terms of the real issues. For these basic reasons, the petitioners have failed to proffer an admissible contention.

Turning very briefly to the question of standing, the petitioners have also failed to carry their burden on this issue.

Their initial amended petition asserted standing was essentially automatic based on the proximity presumption. But the proximity presumption while it may apply to construction permit, operating license, license renewal proceedings and to license amendments that involve major alterations to the facility, it does not apply in this proceeding.

Petitioner's reply does not address this problem and, therefore, petitioners have failed to

carry their burden on standing.

Turning back to the contention, as I mentioned, it's fundamentally a collateral attack on the 2010 rule and on the current licensing basis for the Palisades plant.

When a Commission regulation such as 50.61a specifies the use of a particular analysis or technique, a contention that challenges the use of that technique is inadmissible.

Petitioners claim that the Section 50.61a rule is discretionary and subject to differences of opinion, but the heart of their case is the alleged sheer anomaly of using the Section 50.61a rule at all. And that's just not a matter for this proceeding.

The 2010 rule took over a decade to develop, included consideration of public comments, was reviewed by the Advisory Committee on Reactor Safeguards, an additional expert review panel, and by the Commission.

And in the final rule, as I believe was discussed this morning, the NRC concluded that the risk of throughwall cracking due to a pressurized thermal shock event is much lower than previously estimated.

The screening criteria in the old rule,

the previous rule, are unnecessarily conservative and may pose an unnecessary burden for licensees.

The Commission promulgated Section 50.61a so that licensees could use it. If petitioners disagree, then they should have participated in the rulemaking process, or they could seek to have the rule revised or revoked at this point, but they cannot do so through this proceeding.

As I previously mentioned, the various other licensing actions that petitioners criticize are also not subject to challenge in this proceeding.

They cannot challenge the surveillance capsule schedule that the NRC approved in 2007. They cannot challenge decisions made in the 1980s regarding the disposition of surveillance capsules. The only question in this proceeding is whether the requirements of Section 50.61a are met.

To the extent they do focus on issues related to Entergy's license amendment, they either misconstrue or misunderstand the data inputs and the analysis methods.

50.61a requires that calculated embrittlement predictions be verified against surveillance data for similar materials.

The petitioners argue that these data

allegedly come from dissimilar plants, but this is a collateral attack on the rule. The rule requires Entergy to use all available data for Palisades, and from other similar plant - similar materials.

And in any event, on Paragraph 27 of Mr. Gundersen's declaration, he admits that it is true that the materials are similar.

And while counsel for the petitioners this morning has talked about metallurgical differences and copper and nickel content of the materials, we did not see any of that in their contention. Those issues are just not part of the contention.

Second, Section 50.61a provides specific statistical verification tests to ensure that calculated embrittlement predictions match the surveillance data.

Petitioners do not allege any deficiency in Entergy's use of the three statistical tests specified in the rule.

When they attempt to impose a different statistical test which comes out of NRC guidance on assessing the uncertainty in fluence measurements as an input into the fluence model, a test that does not address variations in fluence and does not address the validity of embrittlement outputs, they're, again,

collaterally attacking the 2010 rule. So, there is no battle of the experts.

Rather than presenting a reason basis or explanation for their position, petitioners have not raised any dispute with the application and its compliance with the rule. Their claims are outside the scope of this proceeding, immaterial, unsupported and fail to raise a genuine dispute on the material issue of law or fact.

And I would like to briefly address a couple of other points that have come up this morning. The ASME code in-service inspections that was discussed, counsel for the petitioner suggested that the last in-service inspections were in 1995. In fact, the application shows that those last set of tests were in - or inspections were in 2014.

And it is those 2014 inspections that were used in the license amendment request as the basis for the assessment required in the regulations.

There is also nothing in the petition that raises the issue of the ASME code inspections, the in-service inspection requirements. That's not part of the contention either.

So, to the extent they're seeking to amend their contention today, that's impermissible under the

rules as well.

The Belgian reactor pressure vessel issues that have been repeatedly referred to this morning, I have not had a chance to exhaustively search their reply, but I don't see any reference to the Belgian reactor pressure vessels in any materials that are in the record of this proceeding.

And finally, I would also like to clarify the question that Judge Arnold asked earlier this morning about the acknowledged problem of worsening embrittlement.

I would just disagree with that statement to the extent that there is an acknowledged problem. Certainly any reactor pressure vessel over time will experience damage due to neutron irradiation embrittlement. That's the nature of how this works, but there is no acknowledged problem.

So, for all these reasons the Board should deny the Petition. Thank you, Your Honors.

JUDGE ARNOLD: I'll start this off and that was my very first question to you. So, thank you for your anticipating it.

I guess a lot of this has to do with the coupons that are in the reactor vessel. Now, is there right now in your reactor vessel a coupon which if

withdrawn and tested now, would give you information about the current condition of embrittlement in the reactor vessel?

MR. KUYLER: There are coupons left in the reactor pressure vessel. I could not speak to exactly what information those would provide or what level of embrittlement any of those are at this moment, Your Honor.

JUDGE ARNOLD: Are the coupons located to try to give - to represent the average fluence, or are they located in regions of higher fluence so that they predict future embrittlement?

MR. KUYLER: My understanding is, in general, the coupons are located closer to the core where they experience a higher fluence than the reactor pressure vessel walls so that they do give a prediction when you do take the sample of future embrittlement, Your Honor.

JUDGE ARNOLD: Would you happen to know if any of the coupons that have been removed and studied provide information on the current or future embrittlement of the reactor vessel?

MR. KUYLER: Yes, Your Honor. My understanding is the highest fluence coupon that has been withdrawn and tested experienced a fluence that

is greater than the end-of-life fluence at the end of the current license life through 60 years of time of operation.

JUDGE ARNOLD: So, you don't have to extrapolate to get that end-of-life embrittlement. You have the data.

MR. KUYLER: That's correct, Your Honor.

JUDGE ARNOLD: Now, my understanding is that the schedule for removing coupons has to meet some criteria of Appendix H of 10 CFR 50; is that correct?

MR. KUYLER: That is correct, Your Honor.

JUDGE ARNOLD: And does the current coupon removal schedule meet those requirements?

MR. KUYLER: That is my understanding, Your Honor.

JUDGE ARNOLD: And has that schedule been approved by the NRC?

MR. KUYLER: Yes, it was in 2007.

JUDGE ARNOLD: Do you have the authority to remove a coupon whenever you choose, or is it required that you first get NRC approval?

MR. KUYLER: My understanding is that changes to the coupon removal schedule do require NRC approval, but I would need to look again at the

Appendix H requirements to verify that.

JUDGE HIRONS: Are there four capsules left in the reactor at this point?

MR. KUYLER: Yes, Your Honor, there are four surveillance capsules that could be used to -

JUDGE HIRONS: Including the one that will be removed in 2018 or '19?

MR. KUYLER: I believe that's correct, Your Honor.

JUDGE HIRONS: Okay.

JUDGE ARNOLD: Do you know if you wanted to modify that schedule, does that require a license amendment, or is that just done between you and the NRC?

MR. KUYLER: I do not believe that it requires a license amendment in every -- every time.

JUDGE ARNOLD: If we were to agree with petitioners that a coupon had to be removed now, would our decision be basically directing to staff to approve a change in that schedule?

MR. KUYLER: The schedule itself is part of the current licensing basis of the plant. So, the notice of hearing is limited to the validity of the application.

So, any question about whether the

schedule itself is adequate at this moment or in a few years' time or during - for the plant is an ongoing regulatory matter.

JUDGE ARNOLD: I'm just trying to figure out if the Board has the authority to require a coupon removal at this time.

And staff might want to take note and answer that when it's their chance.

MR. KUYLER: I do believe the answer to that question is no. That would be directing the staff in the performance of its regulatory duties and it would also be outside the scope of the noticed license amendment proceeding.

CHAIR SPRITZER: Can I ask one thing on that?

JUDGE ARNOLD: Yes.

CHAIR SPRITZER: To follow up on that point rather than ordering staff or Entergy, I guess, to test additional capsules, is there any basis, in your view, under which the Board could find the existing analysis that was done to be inadequate for failure to test capsules that could have been tested, but weren't?

MR. KUYLER: Well, the question of the adequacy of the application is, is it adequate under

50.61a?

And the regulation does not require additional capsules to be tested as a prerequisite to implementation.

Petitioners appear to desire that requirement to be imposed, but they have not identified anywhere in the regulation that says that.

CHAIR SPRITZER: So, in your view, 50.61a is essentially exhaustive of what is required, the regulation itself. And we can't look to additional requirements based on what we think might be reasonable or desirable.

Is that a fair summary of your position?

MR. KUYLER: I would agree with that, Your Honor.

CHAIR SPRITZER: Okay.

JUDGE ARNOLD: Having to do with the comparison of the sister plant data, that's the comparison required by 61a(f)(6)(i). And in there it makes mention of a plant-specific or an integrated surveillance program.

Now, I understand you use an integrated surveillance program?

MR. KUYLER: May I confer with my colleague for a moment, Your Honor?

JUDGE ARNOLD: Yes.

MR. KUYLER: My understanding is that the surveillance program at Palisades is plant-specific, but they do use data from other plants as part of that program.

JUDGE ARNOLD: Now, I'm confused because I would think that plant-specific would mean that you use coupons only from the actual plant.

Can you direct me to anyplace in the rules where it says a plant-specific comparison can use outside plant data?

MR. KUYLER: The - if you look at the text of the regulation, and I agree this is an issue that we haven't briefed, but just looking at the text in the regulation and assuming that Palisades has a plant-specific program, it says, the licensee shall evaluate the results from a plant-specific surveillance program if the surveillance data satisfy the criteria described in the paragraphs below.

And those talk about similar materials, if similar materials is available. And, I believe, also the definition of "surveillance data" encompasses data form other plants, Your Honor.

JUDGE ARNOLD: I'm looking at 10 CFR 50, Appendix H, reactor vessel material surveillance

program requirements.

And I read, in an integrated - this is (c)(1). In an integrated surveillance program, the represented materials chosen for surveillance for a reactor are irradiated in one or more reactors that have similar design and operating features.

So, what you are describing to me looks like an integrated surveillance plan. What's the difference?

MR. KUYLER: May I speak to that?

JUDGE ARNOLD: Yes, please do.

MR. KUYLER: I'm sorry, Your Honor. This, again, was an issue that the parties have not briefed or explored to any extent.

May I clarify, Your Honor?

JUDGE ARNOLD: Yes.

MR. KUYLER: As I understand it, the plant-specific program for the Palisades plant under Appendix H uses only data from the Palisades plant. So, it is a plant-specific program and that Appendix H program does not consider data from other plants.

On the other hand, for the specific tests or checks that need to be done under 50.61a, we were required and did use data from other plants.

JUDGE ARNOLD: So, would this be the first

time then that the NRC has received from you an evaluation from Palisades - for Palisades that uses data from other plants? Coupon data.

MR. KUYLER: I don't believe that's the case. I do understand that some of the WCAPs that have been submitted in the past, and the petitioners reference, included data from other plants because these were similar materials.

And one of the purposes of these documents was to collect in one place the surveillance data from all of the materials that are similar to those used in the Palisades plant.

JUDGE HIRONS: I wanted to ask the applicant about the coupon total schedule. Now, I believe there were eight coupons installed originally, and then two more added.

MR. KUYLER: Yes, Your Honor. There were eight fluence surveillance coupons that were in the original installation. And then two more were installed at one point or another.

JUDGE HIRONS: After the reactor had been operating?

MR. KUYLER: Yes, I believe that's the case for those other two.

JUDGE HIRONS: So, then up through 1993

there were - must have been about six capsules tested; is that right?

So, about every five years?

MR. KUYLER: I don't believe that is the case. I believe that in the - that -

JUDGE HIRONS: Because there hasn't been one tested since '93; isn't that right?

MR. KUYLER: I understand the -

JUDGE HIRONS: Or 2003, I mean. Excuse me.

MR. KUYLER: My understanding is that the last one was tested in 2003.

JUDGE HIRONS: Yeah. Okay. Well, I guess my question, and I'd like you to comment on, now we're talking about a 16-year period before we test the next one. And that time difference is really at odds with the first 30 plus years of the reactor.

Could you comment on how the schedule got to this point?

MR. KUYLER: I would first observe that the overall schedule itself is actually not at issue in this proceeding, but -

JUDGE HIRONS: I understand that. I'm just looking for sort of your feeling or information about why the difference, the large difference in the

time period here.

MR. KUYLER: My understanding on this is that earlier in the plant's life there was a need to collect data. And at this point in the plant's life, we have data that runs all the way out through the end of 60 years of operation.

And so, there is less of a need at this moment to collect more data.

JUDGE HIRONS: But the intent is to collect or take out those other capsules by the end of life, 60 years.

MR. KUYLER: There is one more that is intended to - scheduled right now to be taken out before the end of life. And there are two more that continue to be reserved.

JUDGE HIRONS: Okay. Thank you.

JUDGE ARNOLD: Let me just go back to why I was asking about the difference between the integrated plant and the plant-specific.

In the petitioner's reply on Page 5, they say Gundersen has attested to the lack of proof that the metals from the various reactor pressure vessels match.

So, it sounds like part of this is a challenge that they're actually of the same heat. And

I don't know - I didn't get that from the original petitions, but did you understand that that was part of their challenge.

MR. KUYLER: I did not understand that that was part of their challenge in the original petition. I do not believe that Dr. Gundersen has attested that the materials do not match.

I believe his declaration says that it is true that the materials are similar.

JUDGE ARNOLD: Okay. And in your application, is there a sufficient description of the materials for the staff to determine that they match?

MR. KUYLER: Yes, Your Honor. That is my understanding.

JUDGE ARNOLD: Thank you.

CHAIR SPRITZER: You were asked about the future capsule testing in - the one, specific one currently planned is 2019, as I understand it.

Let's assume the license amendment you are requesting is granted. Testing takes place in 2019 and it shows significantly greater embrittlement than predicted now under the license application - or license amendment application that you have submitted.

What happens then, if anything?

MR. KUYLER: In Section 50.61a, there are

requirements for subsequent evaluation. So, if the capsule were to be tested and were to show significantly different embrittlement results than what existed to date, there are reporting requirements and actions that are required under the regulations.

CHAIR SPRITZER: Okay. And now, is that comparison between the embrittlement demonstrated in the testing in 2019 and what's present today, or what's predicted under the model for 2019?

I would assume it would be the latter, but I might be mistaken.

MR. KUYLER: The subsequent requirements are in Section 50.61a(d)(1).

CHAIR SPRITZER: Okay.

MR. KUYLER: And it refers to whenever there is a significant change in the projected values of RT(max-x).

CHAIR SPRITZER: Okay. So, there are things you would have to do. You're not completely off the hook, so to speak, at this point.

Simply because your license amendment is approved, you still have to look at what future testing shows in the way of embrittlement and fluence.

MR. KUYLER: Absolutely, Your Honor.

CHAIR SPRITZER: What if that test -

hypothetically, of course, what if that test were done now instead of in 2019 and it showed greater embrittlement than predicted?

Would that affect the decision on the license amendment?

MR. KUYLER: It theoretically could, Your Honor. The calculations in 50.61a are required to - well, let me take it a step back.

The surveillance - the calculations out of the model would still be largely the same because you use the equations that are in the regulations. The question would be whether or not the output still matches the statistical checks.

So, if it doesn't, I would have to look more closely at the regulations as to what would have to happen at that point.

CHAIR SPRITZER: Okay. We're probably going to be taking - despite our plans to finish by 12:30, we don't appear likely to do that. Maybe you could take a look over the lunch break and see if you could -

MR. KUYLER: Certainly, Your Honor.

CHAIR SPRITZER: -- explain that to me.

I think we've been over this, but I just want to make sure I understand your argument.

With respect to the data from other plants that was used pursuant to 50.61a(f)(6), I take it it's your position that beyond the statistical tests used that are referred to in that subsection, that there are no other tests either in the regulation itself or in the applicable staff guidance that applied here.

MR. KUYLER: The statistical checks of the embrittlement outputs are specified in the regulations and they are required.

CHAIR SPRITZER: Okay.

MR. KUYLER: There is - if we're talking about the one sigma 20 percent test, that is specified in Reg Guide 1.190. It's discussed on Page 3 of that reg guide, as I think we mentioned in our brief.

And that's used to assess uncertainty in fluence between the measured fluence data from the capsules, and the fluence model that the applicant licensee prepares.

CHAIR SPRITZER: Those are the capsules at Palisades, not capsules in other plants, if I'm understanding your argument.

MR. KUYLER: That's correct, Your Honor.

And it's a comparison of the fluence data at a particular location doesn't match what the model calculates, not - and the uncertainty of it, not the

variation across the core, not the variation in terms of time, whether there was one particular outage or another, and that's fluence data.

Later after you run through the 50.61a calculation, you get an embrittlement output, the RT(max-x), and the embrittlement curve. That gets compared to the embrittlement data from those capsules under the 50.61a test. And that includes both Palisades and other materials.

CHAIR SPRITZER: I mean, it sounds to me like the purpose of looking at the data from other plants is we're looking at samples of the same material, or very close, that have been exposed to an equivalent fluence. And we want to see the level of embrittlement of those samples and compare them to the level of embrittlement at Palisades and do they seem to be - or predicted for Palisades and do they seem to be matching up fairly, or not.

Is that - am I understanding that correctly?

MR. KUYLER: Yes, Your Honor.

CHAIR SPRITZER: Okay. Just a few more and then we're going to take a break.

On the question of our scope and review, your position seems to be limited to looking at -

solely at the issue of compliance with 50.61a as written, perhaps as supplemented by relevant staff guidance, but nothing beyond that.

I suppose another argument the petitioners, I think, have made or at least I make is that our authority is broader than that and extends to the question of whether the license amendment is consistent with the requirement of providing reasonable assurance of public health and safety.

Is there any merit to that position?

MR. KUYLER: The rule itself represents the Commission's determination of what is the reasonable assurance of public health and safety.

So, because of that, the scope of this license amendment review is whether or not it complies with the rule. And if it does, then there is reasonable assurance to public health and safety, Your Honor.

CHAIR SPRITZER: Okay. I think you said you were going to get back to us after the break on the question whether a license amendment is required to change the sampling schedule.

MR. KUYLER: Yes, Your Honor.

CHAIR SPRITZER: So, I won't pester you with that question right now.

I understand your position about capsule A-60 and it not really being relevant to this case, but I'd still like to know was it ever pulled from the reactor and tested for embrittlement at any point, or is it still in the reactor?

MR. KUYLER: It was pulled from the reactor. It is currently in the spent fuel pool, to my understanding.

What happened was there was an outage when it was scheduled to be removed and they had difficulty removing it. There were problems with that. So, they had to leave it in for another cycle.

And when eventually they did remove it, it had experienced more irradiation than it would have experienced even beyond 80 years of plant - than the reactor pressure vessel would have experienced even beyond 80 years of plant operation.

And so, by the time they finally got it out, as the NRC determined 30 years ago, it would provide no useful value at least at this point.

CHAIR SPRITZER: I mean, I guess my question then is, the extra radiation or excessive radiation is received, but that's still coming from within the reactor, isn't it?

MR. KUYLER: That's correct, Your Honor.

It's because of the position of where this capsule is. It's much closer to the core than the reactor pressure vessel itself.

And it was - if I'm not mistaken, it was a supplemental - it wasn't. I'm sorry, Your Honor.

CHAIR SPRITZER: I mean, it sort of sounds - the justification sort of sounds like, you know, it got so much radiation that it wasn't useful in analyzing embrittlement.

But my, you know, my understanding being that of a lawyer, not a scientist, is that's the whole purpose of the capsule is to measure the response of the material in the capsule to radiation.

I guess your argument is, if I understand it is, well, this was just not a realistic, you know, sample of the radiation you would expect the reactor to - the capsule to be exposed to over the history of the reactor even going out to 60 years.

Am I understanding that correctly?

MR. KUYLER: Yes, Your Honor.

I would preface this again by saying our primary objection to this issue is that this was a licensing decision that was made 30 years ago in the 1984 safety evaluation. So, it's part of the current licensing basis of the plant and not subject to

challenge here.

However, the capsule itself was embrittled beyond the point at which the reactor pressure vessel at least at this point in its licensed life would be expected to experience. So, it wouldn't provide useful data for the fluence model that is being used at this point.

CHAIR SPRITZER: You said the material is embrittled. I think you probably meant irradiated.

MR. KUYLER: Irradiated, Your Honor.

CHAIR SPRITZER: Okay. Couldn't that data, though, still tell us something about embrittlement trends?

MR. KUYLER: I would need to confer with my expert to talk about that.

CHAIR SPRITZER: I can certainly sympathize with the position of a lawyer trying to understand this.

Let me make sure I understand. Was it ever tested for embrittlement as opposed to the level of irradiation? That's this Capsule A-60.

MR. KUYLER: My understanding is that it was not, Your Honor. That it was simply removed from the reactor pressure vessel and has been in storage in the spent fuel pool since then.

CHAIR SPRITZER: And the reason I'm asking, and maybe you can comment on this is, in the definition of "surveillance data," this is in 50.61a(10), the Definitions section, surveillance data means any data that demonstrates the embrittlement trends for the belt line materials including, but not limited to, surveillance programs at other plants, et cetera.

Sounds to me like surveillance data could include testing done even if it was done outside the regular authorized surveillance program.

Do you have any comment on that?

MR. KUYLER: The capsule itself has not been tested. So, there is no data available. And under the Appendix H program, we're not required to test it and collect that data. So, there's no data that would meet the definition of the regulations.

CHAIR SPRITZER: Okay. I think I understand your position.

Did you have anything else?

JUDGE ARNOLD: No.

CHAIR SPRITZER: Let me just quickly review my notes and we'll take a break at that point.

(Pause.)

CHAIR SPRITZER: I don't think I have

anything further. As I said, we're now at 12:30 and we haven't gotten to the staff.

So, rather than prolong this and make people wait for perhaps another hour or so to finish, why don't we take a break now, come back at 1:30, an hour from now.

There is a cafeteria downstairs for those who may not be familiar with our building. It's open to everybody. So, let's try and be back here at 1:30 and hopefully we can conclude within another hour.

Is that realistic? No more than another hour once we reconvene. Thank you.

(Whereupon, the proceedings went off the record at 12:28 p.m. for a lunch recess and went back on the record at 1:32 p.m.)

A F T E R N O O N S E S S I O N

1:32 p.m.

CHAIR SPRITZER: We're ready to go back on the record, Mr. Reporter. Thank you.

Before we - we'll go back and we have a few things to take up with Entergy. And then we'll move on to the staff.

Before we do that, over the lunch break we discussed this issue that's been raised. I guess it was raised by the petitioners in their reply on Page 5 where they say that 50.61a(f)(6)(i) requires that the surveillance material must be a heat-specific match for one of the materials for which RT(max-x) is being calculated.

And then they say Gundersen has attested to the lack of proof that the metals from the various RPVs, reactor pressure vessels, match.

We would allow the staff and Entergy to file a brief since this was raised in the reply and you haven't had an opportunity to address it. I don't believe it was raised in the original petition.

If you would like, you're not required to, but if you would like to file a brief response to that specific issue, no other issues unless we mention them later today, I would think - would 10 days be adequate

to file anything further on that for staff and Entergy?

MR. TURK: Your Honor, I'm Sherwin Turk.

May we ask when the transcript will be available?

CHAIR SPRITZER: Well, that's a good question.

Normally it's available within a couple days after we finish here today. Usually about three days.

MR. TURK: May we time it to when that -

CHAIR SPRITZER: Yeah, that would be fine. Ten days from when the transcript becomes available.

Does that work for everybody?

MR. KUYLER: Yes, Your Honor.

CHAIR SPRITZER: Okay. Now, let's see. We had some matters that Entergy was going to get back to us on after discussing them over the break.

MR. KUYLER: Yes, Your Honor. And just to make sure we have the questions that you were looking at, the first one that we had was, is a license amendment required for changes to the surveillance capsule schedule under Appendix H.

The answer to that is in general, no. Under the requirements of Appendix H, that capsule

schedule needs to be reviewed and approved by the NRC staff, but that does not need to be in the form of a license amendment.

CHAIR SPRITZER: Okay.

MR. KUYLER: Second, would the capsule that was discarded from the program in the 1980s, would that provide useful data?

And the answer is it could provide embrittlement data for the Palisades reactor pressure vessel materials.

It was unable to be removed in the early 1980s. But as I understand, it was eventually removed in the mid-1990s.

And by that point, it had experienced fluence far beyond what would have - what the reactor pressure vessel would have experienced at the end of 80 years of operation so that any data, embrittlement data that could have come out of that capsule would just not be useful. It would be beyond the curves that consider the plant's licensed life.

It could provide theoretically research data. That is possible, but it wouldn't be relevant to the licensing basis for the Palisades plant.

CHAIR SPRITZER: I think one of our questions earlier was to the effect that couldn't it

provide data on embrittlement trends even if those trends extend out beyond the 60-year period of operation?

I mean, if you have a data point further out, that still could provide some information on trends, I would think, but let me ask you the question.

MR. KUYLER: Let me confer one more moment with my expert.

(Pause.)

MR. KUYLER: It could provide embrittlement data that could possibly speak to trends, but it depends on the model. And we would need to look more closely at the fluence model that Westinghouse has prepared in order to answer that question, Your Honor.

JUDGE HIRONS: I just wanted to clarify that there was no testing of this capsule then?

MR. KUYLER: That's correct, Your Honor.

CHAIR SPRITZER: For embrittlement, for fluence, or both?

MR. KUYLER: If I may for a moment, Your Honor?

CHAIR SPRITZER: Absolutely.

MR. KUYLER: It's never been tested for

any purposes, Your Honor.

CHAIR SPRITZER: Okay. The number - I seem to remember somewhere there was a figure for fluence for the capsule given.

Was that then based on a calculation and not based on actual analysis of the contents of the capsule?

MR. KUYLER: I would have to look back at the documents to answer that question, Your Honor.

CHAIR SPRITZER: Okay. Can we do that? I can try and help you, I think.

On Page 19 of the Petition, there may be other references, but this is the one I had in mind, that single-spaced quote in the middle beginning "As of October 31, 1982, the licensee indicates that Capsule A-60 had accumulated approximately 8.7 x 10 to the 18th neutron fluence."

MR. KUYLER: My understanding of that, Your Honor, is that is simply an estimate. That did not come from the testing of the fluence of that specific capsule.

CHAIR SPRITZER: All right.

MR. KUYLER: There was a third question that I believe Your Honors asked us to look into. I think the question was, what would happen if there was

new data available and it led to a situation where one or more of the statistical checks in 50.61a was not met.

CHAIR SPRITZER: Uh-huh.

MR. KUYLER: In that case, 50.61a(f)(6) specifically addresses further actions that need to be taken if those statistical checks are not met.

And there's basically additional analysis that needs to be done in order to demonstrate the validity of the model.

CHAIR SPRITZER: Okay.

MR. KUYLER: But that's not the situation we're in, because we did pass the checks.

CHAIR SPRITZER: Right. Just returning one last point on the capsule, is there any impediment now to -- if Entergy were to decide let's go check this capsule now, not saying you're required to do it, but let's just say somebody decided they wanted to do that.

Is there some kind of physical impediment to doing that given that it's in the spent fuel pool, or can it be removed and tested if you thought that was - would be helpful?

MR. KUYLER: My understanding is that it would be physically possible to test that capsule.

Yes, Your Honor.

CHAIR SPRITZER: Okay. Let me check over my notes.

Do either of my colleagues have any further questions for Entergy before we move on to the staff?

JUDGE HIRONS: Is there a certain time period after the capsule is removed - I mean, obviously it's radioactive - before it can be tested if you choose to do so?

MR. KUYLER: To clarify, Your Honor, you're talking about a time period after it is removed -

JUDGE HIRONS: Yes.

MR. KUYLER: - until the time it is actually tested?

JUDGE HIRONS: Right.

MR. KUYLER: May I confer again?

JUDGE HIRONS: Please.

(Pause.)

MR. KUYLER: I am not aware of any technical reason why you would need to delay any particular period of time.

I do know that once - if a capsule is removed as part of the program, then there is a one-

year deadline from the time you remove it until it has to be -

JUDGE HIRONS: Okay. Thank you.

MR. KUYLER: -- reported to the NRC.

CHAIR SPRITZER: Now, with respect to the capsules at the - the so-called surveillance data, the capsules from other plants that I take it were removed, tested and that data was then used for the surveillance data for Entergy's license amendment, is there an error - I would think there is some degree of error in the data you obtained from those capsules, or any capsule when it's tested.

Am I correct about that? Some degree of uncertainty, in other words. No measurement is perfect.

MR. KUYLER: I would agree that no measurement is perfect. That's correct, Your Honor.

CHAIR SPRITZER: Do you know how the issue of uncertainty in the surveillance data assuming there is some, do you know how that's factored into the analysis under 50.61a(f)(6)?

MR. KUYLER: I do not, but I would also just bring us back to the idea that when you're looking at uncertainty under that one sigma test that's in the Reg Guide, that's uncertainty in

fluence.

CHAIR SPRITZER: No, I understand that. I understand that, but we're not talking about - that's not - I understand your position, but that's no applicable here. I'm not suggesting it is.

All I'm asking is, I would think as a non-expert, of course, that there is some uncertainty in measurement data, both the dosimeter and the material that's in the capsule that you test for how it's responded to neutron fluence and there would be some uncertainty in those measurements as well.

I'm just curious as to how - if that exists. And if it does, how is it factored into the analysis?

But if you're not sure of the answer, maybe the staff can help us with that.

MR. KUYLER: May I confer with my expert?

CHAIR SPRITZER: Certainly.

(Pause.)

MR. KUYLER: Our understanding is that there is some uncertainty, but that is taken into account in the statistical checks.

But also just to keep in mind, at the front end we're talking about fluence which is one of the two types of data that comes out of these

capsules.

CHAIR SPRITZER: Right.

MR. KUYLER: At the end in the statistical checks under 50.61a, we're talking about embrittlement which is the other set of data.

But as I understand it, any uncertainty in that embrittlement data is accounted for in the statistical checks.

CHAIR SPRITZER: Okay. All right. Why don't we move on and hear from the staff? We will give you ten minutes for an opening statement if you want to make one, and then we'll ask you some questions.

MR. LINDELL: I will begin with an opening statement. May it please the Board, I'm Joseph Lindell representing the NRC staff.

The NRC regulations are designed to prevent a pressurized thermal shock event from occurring. There are two provisions in our rules that are concerned with pressurized thermal shock and that's 10 CFR 50.61 and 10 CFR 50.61a.

A licensee can comply with either one. And what Entergy has done here is applied to use 50.61a in lieu of 50.61.

Both rules rely on reference temperatures.

So, they'll calculate how the reference temperature of the steel relates to how much the steel will bend before failing.

So, the reference temperature of the steel has to remain within certain limits to comply with the rules. It can't get too high.

If it were to get too high, that's the concern with pressurized thermal shock. There's a potential of colder water floods the reactor, and the reactor vessel could fail in a more brittle rather than a ductile fashion.

In this case, Entergy applied to use 50.61a and its reference temperature limits instead of the reference temperature limits in 50.61.

50.61a lays out how an applicant goes about, you know, using those, the reference temperature limits that it provides.

And though we've been over this sort of in different ways, I just want to - hopefully it will be helpful to the Board just to lay out clearly what Entergy is required to submit under the regulations in its license amendment request.

So, the first thing they do is they submit to the NRC projected reference temperatures for the reactor vessel belt line materials. And they do this

using the equations that are laid out in the rule.

The second thing is that they verify the calculations, match the embrittlement model in the rule by considering data from available surveillance capsules already withdrawn from the Palisades reactor and capsules withdrawn made out of similar materials from other reactors. And that's what the rule requires.

And then 50.61a then provides statistical tests that the applicant must perform using the data from these capsules.

The next thing the applicant must do is must conduct an inspection of the reactor vessel belt line for flaws to see if the population of flaws in the vessel represents well the number and size of the flaws on which the reference temperature limits of 50.61a were based.

And then, finally, the applicant must compare its projected reference temperatures to those in Table 1 of 50.61a to see if it meets those limits.

Then, you know, if those limits are not met, there are other provisions in 50.61a for how an applicant will deal with that.

So, after outlining what Entergy was required to submit in its application, a hearing on

the request for the amendment is limited to those matters.

The notice in the Federal Register explicitly limits the scope of any hearing to the amendment at issue.

A petitioner must challenge what the licensee wants to change. For example, one could, in theory, have a contention about whether Entergy submitted the required information, or whether Entergy's analysis of the data in the application is correct.

However, the Board cannot hold a hearing on whether the rule should have required something else, or whether Entergy should make different demonstrations before using 50.61a than the demonstrations that the rule requires.

The Commission has already determined that if a licensee demonstrates that it meets the requirements of 50.61a and the staff, of course, reviews that amendment and approves it, which in this case the staff is under review, it's not a done deal yet, the staff still has to approve, but once they meet those requirements they can use 50.61a. And absent a waiver of the rule, the petitioner can't challenge the actual provisions of the rule.

None of the petitioner's arguments challenge Entergy's application. Rather, petitioners challenge the requirements of 10 CFR 50.61a, they challenge matters related to other licensing actions and prior licensee and staff actions.

They don't challenge Entergy's compliance with 50.61a or actually dispute any element of Entergy's submission.

The petitioners have not submitted an admissible contention, and the Board should deny the petition to intervene and request for a hearing.

I'd like to in the remaining time that I have, I'd like to just address some of the matters that have been raised here by the petitioners and Entergy. And of course I'm open to further questions from the Board on these matters as well.

Petitioners talk about how this is a form-fitting regulation that's sort of just designed for Palisades to somehow escape certain regulatory limits that the Commission has set and this is not the case.

This is a regulation that is - can be used in lieu of 50.61. And any licensee that meets the criteria can apply. And if their application meets the further criteria, you know, it will be approved by the staff. But just to reiterate, that approval is

not guaranteed. It's something that the staff reviews and looks into.

With regard to the in-service inspection, the petitioners didn't raise anything concerning the in-service inspection in their petition.

At argument here, they mentioned that there was none that was done since the '90s or the early 2000s, and this is not the case.

I believe counsel for Entergy already explained this, but there was an inspection in 2014 to see if they comply with that provision, you know, to comply with that provision, it requires them to do this inspection to look for the flaws.

And I believe what the application says is the criteria for how to conduct that inspection is based on certain documents issued in the early 2000s, but the inspection was done to comply with the rule.

Now, with regard to sister plant data, and this is something that we've dwelt on considerably here, but with the Board's permission I'd like to just go through the rule and just try to clarify what exactly is required and what is not required.

If we look to the Definition section in 50.61a, and that's 50.61a -- Subsection A(10), it defines surveillance data. And the definition of

surveillance data includes surveillance programs at other plants. So, that meaning of surveillance data does encompass data from other plants.

And if we look at the provision of the regulations where it talks about the licensee doing the consistency checks, and that's 50.61a(f)(6)(i), there it says that the licensee shall evaluate the results from a plant-specific or integrated surveillance program if the surveillance data satisfy the criteria described in the further paragraph.

So, there's that word "surveillance data." And what it's saying is this surveillance data, as we saw before, can include data from Palisades, but it can also include data from sister plants. Any plant-specific or integrated surveillance program, meaning it could be a plant-specific program at Palisades, it could be a plant-specific program elsewhere.

But either way if there's surveillance data that matches the further criteria, that surveillance data has to be considered and you run the surveillance checks.

And the two requirements that are then set out for when that surveillance data either from Palisades or other plants is considered, is it has to be a heat-specific match which means that the metal

has to be made of the same materials for which the reference temperature is being calculated. So, that's number one.

And then number two, there has to be three or more surveillance data points measured at three different neutron fluences.

So, once those two requirements are met, then whether that surveillance data is from Palisades or from a sister plant, that licensee would be required to submit that as part of the application and run the - not just submit it, but run the statistical checks on that material.

And it doesn't matter whether a difference is in the operational characteristics of the plant as in regard to the cores and the designs and the manufacturers, but rather they still have to run the statistical checks if the materials match.

And, in fact, Dr. Gundersen as we've been through, has attested to this. He said that while the material is, you know, the materials between the reactors are similar, but the operational characteristics are different, but our understanding is the rule would still require them - require them to submit that data.

There was also something -

CHAIR SPRITZER: If I could just briefly interrupt?

MR. LINDELL: Yes. Sure.

CHAIR SPRITZER: So, it's your position that the operational characteristics of the sister plants is really a red herring, it's an irrelevant issue?

MR. LINDELL: For the purpose of doing the surveillance checks, yes, because that data including, you know, the different fluences that might be experienced at different plants is something that's accounted for in the checks themselves.

CHAIR SPRITZER: Okay.

MR. LINDELL: In the equations for the checks themselves.

I may be - I don't know if I'm going over my time or not. So, feel free to interrupt with questions, but there are just a couple more points I wanted to raise with regard to sister plant data.

I think something was brought up with regard to the prior use of sister plant data whether this has indeed been used before.

And the answer to that is, yes, that in prior submittals related to when Palisades was projected to exceed the screening criteria for

reference temperatures in 50.61, they did also submit sister plant data from those similar material matches at other reactors in looking at that. So, this is not the first time that that data has been submitted and utilized by the NRC in making determinations.

And one other matter is when we talk about the statistical checks and comparing the - and comparing the data between the different plants, we're not comparing the fluence of the surveillance capsules from the other reactors to the fluence from - the data from, you know, to the embrittlement trend at Palisades. Rather, we're comparing the embrittlement trends between the two plants.

If you have the same material, then what you want to see is does the reference temperature increase at the same rate with embrittlement. Because the fluence between that, between those two plants, then they have a different expected end-of-life fluence, capsules may be, you know, at different fluence levels, what you're really looking at is do we see if you plot those points on a curve, do we see the reference temperatures increasing at the same rate with the embrittlement.

And with that, I can turn it over for further questions.

CHAIR SPRITZER: Just on the issue of surveillance data, does the staff interpret that as limited to data collected pursuant to the plant's surveillance program?

If it's coming from the plant that is applying for the license amendment, in this case, Palisades, does that include only data collected pursuant to the surveillance program, or would it include other data on embrittlement trends that the plant may have collected even if it wasn't pursuant to the surveillance program?

MR. LINDELL: I'm not sure exactly what other data you're referring to.

CHAIR SPRITZER: Well, as a specific hypothetical suppose -

MR. LINDELL: Okay.

CHAIR SPRITZER: I know this is - Entergy tells us this is not the case, but suppose Capsule A-60 while it had been excluded from the surveillance program, had at some later date been tested and data on embrittlement trends had been obtained from that capsule.

Would that be surveillance data?

MR. LINDELL: Well, it is - it's not surveillance data - well, if it had been tested, then,

yeah, that would indeed be surveillance data.

CHAIR SPRITZER: Even though it was outside their planned surveillance program at the time they actually did -

MR. LINDELL: Yes, that would still be surveillance data then under what the rule provides for if it was tested, but Capsule A-60 was not tested. So, we don't have that data.

CHAIR SPRITZER: Okay.

JUDGE HIRONS: Could you comment on the impurities in some of the steel, what effect that has on the embrittlement?

Because I believe there can be - there are different compositions of steel particularly if you're comparing with other plants.

MR. LINDELL: Let me consult with my expert for a moment about that.

JUDGE HIRONS: Sure.

(Pause.)

MR. LINDELL: The differences between the impurities in the different metals is part of what's accounted for in the equations in the rule, essentially. That the embrittlement trends that are predicted by the equations in the rule do account for those differences between the different materials and

their makeup.

JUDGE HIRONS: Okay. Thank you.

(Pause.)

CHAIR SPRITZER: Let me ask some - to some extent these overlap with questions I asked of Entergy, but I want to make sure I'm getting the staff's position as well.

With respect to future capsule testing, how does the staff understand - what does the staff understand the effect of future capsule testing to be assuming the license amendment is granted?

In particular, suppose the testing that takes place in 2019 of the surveillance capsule shows significantly greater embrittlement or greater embrittlement trend than predicted now.

What happens then, if anything?

MR. LINDELL: If there are - are you asking if the capsule data demonstrates that Palisades will exceed the screening criteria that are listed in 50.61a?

CHAIR SPRITZER: If it demonstrates a different embrittlement trend that would lead, yes, to exceeding the screening criteria at some point.

MR. LINDELL: So, then we go into 50.61a(d) which provides for further testing and

actions to deal with that. And some of those things are some of the same things that were required under the old rule under 50.61 such as flux reduction programs, possibly even annealing the vessel and things of that sort, or, in general, making sure that they get approval from the director of NRR for further actions that they would take.

CHAIR SPRITZER: What criteria does the staff have, or does it have any, for determining whether what we call surveillance data, the data from other plants, can appropriately be used under 50.61a(f)(6)? That is, is there anything beyond the statistical tests, or is that the total universe of criteria we need to be concerned with?

MR. LINDELL: That's what 50.61a lays out for the uses of the surveillance data that perform the statistical tests to see if the embrittlement trend matches the embrittlement trend that's predicted through the use of the equations in the rule.

CHAIR SPRITZER: I was asking Entergy about whether there were any way of accounting for the uncertainty in the - whatever uncertainty may exist in the capsule data. And they said that's basically taken into account in the statistical tests in the regulation.

Does the staff agree with that?

MR. LINDELL: The staff would agree with that, yes.

CHAIR SPRITZER: Okay. I wanted to ask about in your response to the petition, you talk about starting with 50.61 and that data over a period of time were gathered from a number of reactors or that showed that the 50.61 was overly conservative; is that correct?

MR. LINDELL: The term "overly conservative" is indeed used in the - in the Statement of Considerations for the new rule.

Just to expand upon that a little bit, what we really mean by that is that we've done a lot more testing since the initial rule was promulgated in 1985.

So, we have more actual physical data from a range of plants. And we also have better computer modeling. We've been able to simulate a pressurized thermal shock event more accurately using the computer that wasn't available when the original rule came out.

So, based on that, what we found is that different reference temperatures could be used to provide the same level of safety.

JUDGE HIRONS: So, this was looking at

data from over some period of time for all the plant data that you had available?

MR. LINDELL: Yeah, this is looking at plant data for a period of 28 years, approximately.

JUDGE HIRONS: Okay. Thank you.

CHAIR SPRITZER: You had mentioned that staff has not finished its work yet on the license amendment.

Can you tell us what work remains to be done? And to the extent you can, what the schedule is?

MR. LINDELL: Well, what I know is that the staff has - is going through its normal process for approving this - or approving or disapproving this application. So, they've put out a request for additional information, which the licensee has responded to.

And then there were additional requests for - there was another round of requests for additional information sent, and I believe that's where we are in the review process right now.

CHAIR SPRITZER: So, was there any target date for the SER? There is a - you will prepare a Safety Evaluation Report? Am I correct on that?

MR. LINDELL: Yes. As per our process for

a license amendment, we will prepare a safety evaluation.

I don't believe there's any particular target date for that right now.

CHAIR SPRITZER: Are we talking 2015? 2016?

MR. LINDELL: I'd have to consult to make sure I'm getting our -

CHAIR SPRITZER: Okay.

MR. LINDELL: -- you know, our process exactly right.

CHAIR SPRITZER: Do you have - is your expert here today able to give you that, or do you have to check with others?

If you do, you can just -

MR. LINDELL: We do have people back there who will be able to give us that information.

CHAIR SPRITZER: Okay. While he's checking, why don't we - I don't know if there are any other questions.

I mean, if we were to grant an evidentiary hearing on this case, I assume it would be the staff's position that it should wait until the SER is actually issued, which seems to be our normal practice, but I haven't had this come up in a license amendment case.

MR. LINDELL: Your Honor, there's no requirement that a safety evaluation is waited for to hold that evidentiary hearing, but that is what we prefer. We would prefer to wait until the safety evaluation was issued.

CHAIR SPRITZER: I seem to remember, and maybe I'm misremembering, that Entergy wanted an answer or wanted to have the license amendment issue resolved by June or July of this year.

Am I off base on that, or is that correct?

MR. KUYLER: I do believe, Your Honor, that we said in the license amendment request that it be - we asked that it be approved within a year.

CHAIR SPRITZER: Okay. What's Entergy's, I mean, again, if hypothetically we granted the request for a hearing, what would Entergy's view be as to whether we should wait for the SER?

MR. KUYLER: As I understand the model milestones in Part 2, typically the hearing would be held after the staff's position is finalized in the safety evaluation.

CHAIR SPRITZER: Certainly would seem to make more sense to do it that way. It's kind of hard to know the staff's position if we haven't formulated it yet.

MR. KUYLER: That's correct, Your Honor.

CHAIR SPRITZER: Okay. Did you have some more information for us on the schedule?

MR. ROTH: Thank you, Your Honor. This is David Roth for the staff. Concerning the schedule, the staff are aware of the request for a one-year turnaround time for it. That year has not yet expired and the staff have not issued a final decision on that yet.

I will add with respect to a previous question you had regarding measurement uncertainties, the tests that are being done also include, as you correctly stated, measurement uncertainties.

The standards for doing the tests for actually sampling little v notch bars are present in ASTME-23. And that's American Society of Testing and Material standard. And that's one that's used by the plant pursuant to its program.

So, the brief answer is that measurement uncertainties are taken into account and there's a standard that addresses those.

CHAIR SPRITZER: Okay. All right. We will give you five additional minutes, plus time for any additional questions we might have. That is for the petitioners.

MR. LODGE: Thank you. There are several -

JUDGE ARNOLD: Microphone, please.

MR. LODGE: Very good. There are some housekeeping matters that I would like to address, please.

One of them is that, I apologize, my references to the Belgian report. The petitioners brought it up in the EMA petition on March 9th. It was not mentioned in the reply of January 20th or the December 1st filing. That's because the information only became available in February of this year.

And I would - to the extent it may be necessary for the Board to decide the issues before today, I would request that the Board take official or administrative notice of our filing of March 9th.

I understand there is no answer yet. I'm sure that by the time this board is deliberating that, that there probably will be, because the 25-day limit is coming up soon. Probably next week.

CHAIR SPRITZER: I'm not sure I understand. What is it you want us to take -

MR. LODGE: Well, there's mention - we attached to the March 9th filing the report that I had made reference to this morning.

CHAIR SPRITZER: Uh-huh.

MR. LODGE: And had made several references to it. Just -

CHAIR SPRITZER: And you want us to take notice of that report in this case as well?

MR. LODGE: Yes.

CHAIR SPRITZER: Is that what you're asking for?

MR. LODGE: Correct.

CHAIR SPRITZER: All right.

MR. LODGE: To the extent that we were relying on it as part of our arguments.

Secondly, Mr. Spritzer, you had asked about whether Arnie Gundersen was referring to Table 2.2-5 or -4. It was the fluency table, which is 2.2-5. I spoke with him over the lunch break. So, to answer your question, you picked up that typographical mistake.

The 2014 ISI, we don't have much information about it. Just learned about it the first time today.

Thus, neither we nor the Board understands whether it was a full or partial or superficial type of investigation into the status of the welds of the RPV.

And I would point out that I believe there is a pending request from Entergy to the NRC for approval to conduct an ISI in December 2015.

I don't know the precise status of that as of today, but as of the time we filed in December that was pending.

There is some seriously conflicting information about the status of the SA-60-1 capsule. You've heard from Entergy's representations essentially of its expert today that the capsule became irradiated, could not - I think I understood could not be removed physically from the RPV in 1982-83. It was basically left in until some point in the 1990s and is very, very, very irradiated.

However, we found at footnote 123 of the Nuclear Regulatory Commission staff's memorandum filed January 12th, it says, as noted in the staff's SER for amendment 79 at Page 1-2 - or pages, I guess, one and two - at the time of issuance, the Palisades reactor vessel material surveillance program contained two capsules located outside the core; Capsule A-60 and Capsule A-240, six capsules that are located in the mid-plane of the core, and two capsules that are located in the low flux region above the core. The SER noted that Capsule A-60 and Capsule A-240 were

located in positions within the reactor vessel that are diametrically opposite each other and had similar neutron fluences and temperatures. The SER concluded that because Capsule A-240 had been withdrawn and tested, it could be used to predict the end-of-life material properties of the Palisades reactor vessel making withdrawal and testing of Capsule A-60 unnecessary.

So, we believe that conflicts in some material ways with what Entergy says is the fate of that particular capsule.

And we believe that, again, the point that we are trying to make not is that we should have to attack a licensing amendment or other kind of decision rendered 30 years ago, but that that - this is significant scientific information relevant to the entire chronology of testing, not testing, rejecting or accepting the capsule destructive testing results.

CHAIR SPRITZER: Have you given us - is there any evidence you can point to that's been cited anywhere in your petition, the reply or anywhere else in the materials before us that would contradict what they have told us, which is that there was no actual testing done of that capsule?

MR. LODGE: I have been straining to

recall, but somewhere in the last 48 hours I think I have seen some additional narration, but I honestly cannot tell you what it said at this point.

If I can find it, I will bring it to the notice of the Board in a formal fashion and we can deal with it at that point, please.

CHAIR SPRITZER: All right.

MR. LODGE: And, finally, as to the matter of why what is proposed should be considered to be a test, I would just point out that it was an FSAR requirement to see in-service inspections be undertaken once every ten years.

So, the 2005 ISI is waived. The ISIs were also, according to a fair reading of FSAR, is they were to be - that data was to be assessed, analyzed alongside any capsule information that was being developed from withdrawing the capsules and doing the testing.

Matters have slipped, as we've pointed out, to a 20-year stretch. And a 20-year stretch where in the last 12 of it there's no capsule testing.

And, in fact, even after the - let's call it the 2015 ISI is conducted, there won't be any capsule pulled and tested for another four years after that.

So, we believe that that certainly is the legitimate source for the observation that matters have degraded to the operation of Palisades being considered to be an ongoing experiment.

It's a very unfortunate situation that we are even here today arguing about why there should be some science and prudence injected into this very vital decision.

I would also point out that the Board has signaled that you have questions as to what power you really have in this circumstance.

In listening to the NRC staff respond to you about 20 minutes ago talking, as they should, about having the discretion to accept or reject the 50.61a application being submitted to them by Entergy, I'm curious to know what different standards or different authority or power that the staff would really have.

It would seem to us that to be consistent if the blanks on the pieces of paper, you know, if the application requirements are simply filled out rotely with sister plant data, with whatever other information is essentially obliged to be provided by 50.61a, then the staff has no discretion either. You check off the boxes, all the information is there,

it's an automatic.

Yet, I think from the tone of what the staff has at least shown here today, that they believe that they do have some regulatory authority here, some power to say no.

We believe that the Board similarly - and I understand the difference that the Board can't order the staff to do this or that, but the Board similarly has the authority to find that an application is not complete. It is not complete for scientific reasons that the petitioners are articulating to you.

For those reasons, we believe that the public is entitled to a trial on the merits on this matter and we request that a hearing be ordered. Thank you.

CHAIR SPRITZER: I don't believe I have any other questions for you, but I'll just quickly review my notes.

(Pause.)

CHAIR SPRITZER: I think this may be a question for the staff: If the ISI is part of the FSAR, is changing the ISI schedule a license amendment?

MR. ROTH: All right. David Roth for the staff. My understanding if they wish to change the

ISI schedule, I believe that would be -- take an action by us.

However, the significance for this application is within the application itself back to Section 7, in-service inspection data, the applicant included its discussion of its in-service inspection, referenced its February 14 report on its in-service inspection.

So, there's not an ISI inspection change that's before the staff or the Board at the moment. Instead, it's an application to use 50.61a. And the application describes the in-service inspection data and has been available to be challenged, but it's not been challenged.

CHAIR SPRITZER: Okay. If there are no further questions, I think we can adjourn. Thank you for everyone's participation. It's certainly been very enlightening for me, and I suspect at least to some extent for my more educated colleagues.

Thank you for your participation. And as far as our decision, as you know, there's a 45-day limit. We will do our best to get the decision out within that period.

My one concern is that we do have this other case and we'll have to look at what's filed. Of

course we don't have the answers yet. When we do, we'll look at those and see how we want to handle the relationship between the two cases.

But in any event, we'll get a decision out on this case as soon as we're able. Thank you.

(Whereupon, at 2:20 o'clock p.m. the hearing in the above-entitled matter was concluded.)