UNITED STATES

NUCLEAR REGULATORY COMMISSION

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MEETING WITH ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(PUBLIC)

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FRIDAY,

JUNE 5, 2026

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The Commission met in the Commissioners' Hearing Room, at 10:00 a.m. EDT, Ho K. Nieh, Chairman, presiding.

COMMISSION MEMBERS:

HO K. NIEH, Chairman

DAVID A WRIGHT, Commissioner

BRADLEY R. CROWELL, Commissioner

MATTHEW J. MARZANO, Commissioner

DOUGLAS W. WEAVER, Commissioner

ALSO PRESENT:

GREGORY HALNON, ACRS Chairman

DAVE PETTI, ACRS Vice Chairman

CRAIG HARRINGTON, ACRS Member-at-Large

PROCEEDINGS

10:00 a.m.

CHAIR NIEH: Okay, good morning. We'll call this meeting to order. And this morning we are meeting with the NRC's Advisory Committee on Reactor Safeguards, and before we get into the meeting I do want to recognize and acknowledge that this morning we just swore in Commissioner Weaver for his next five year term with the Commission. So, it is great to have you back with us, Doug, fantastic.

So, the ACRS has been a valued partner in the NRC's safety decisions for decades, and we are in a consequential moment for American nuclear energy. The ADVANCE Act, and Executive Order 14300 have stimulated the most comprehensive reform of the NRC in decades. And there is a new NRC here, and one that enables the safe and secure use of nuclear technologies.

And we are sharpening our focus on what matters most for safety to make sure that we deliver safety decisions that are credible, predictable, and timely. And this reform also reaches the Advisory Committee on Reactor Safeguards as well, and I appreciate the Committee's efforts thus far to sharpen its focus on safety related to unique, new, and novel technologies, as well as its efforts to improve the operational efficiency of the Committee.

And I am confident that the ACRS will remain a valued partner in our regulatory process for years to come. And two recent examples really highlight the value that this Committee adds. The first one

I'll note is the review of the EPRI alternative licensing strategies document, that is an approach that will enable use of high burn up fuel to extend cycle times for pressurized water reactors.

And also the very thoughtful comments you've provided on the Part 57 rule making for micro reactors, and reactors of comparable risk profiles. I think your insights will continue to add value to the agency, so thank you for that. Before we get into the meeting I'd like to see if any of my colleagues on the Commission have any comments. No? Okay, thank you.

ACRS CHAIR HALNON: Thank you, chairman, and thank you for the time, commissioners, to talk about this sharpening that the chairman talked about. The last briefing we were able to give you was in '24, and in '25 we got kind of overcome with events with the executive order, and other items going on, so we didn't get a chance.

But you saw our presentation, and you could see the trend over the last several years was that we were on a glide path already that complimented, and certainly the EO provided a much more hotter, if you would, burning platform for us to sharpen even further. The past presentations had a lot of technical details in them of letters that you've read, and have thoughtfully considered, and we are not going to do that this time.

We are really going to stay pretty close to the lessons learned, and other items that we've been doing to improve the ACRS process, and help the staff improve, and help the overall agency improve as well. We will touch on some technical matters throughout, but we will focus mostly on the lessons learned, and then I will close a little bit later on with the higher

level comments.

If you would go to the next slide please? The agenda today just follows a line, Dave will provide insights from the recent technical reviews, and Dr. Petti was the initial author of the lessons learned letter, so he's positioned for that. Dr. Harrington will go on to talk more about the process piece of it, so Dr. Petti will talk more technical, and what we learned from doing these reviews.

Dr. Harrington will go into more of how this has improved our process, and how we are applying the lessons learned. Dr. Petti is the vice chair, and Dr. Harrington is the member at large, and so we are part of the leadership team that is helping to drive these improvements. And like I said, I will close on maybe some closing remarks on what I call leadership, craftsmanship of moving an organization forward.

Next slide please, to the mission statement, if you would. The ACRS supports the NRC mission. As you said, chairman, we are integral to the team, we are independent, but I want to put some context around the word independent, because that sometimes gets taken out of context. We make independent decisions, but we do have constraints.

We are constrained by the Atomic Energy Act, we are constrained by the expectations of the Commission, by the executive order, so we do have constraints, and we do serve a higher purpose of safety, but we do make independent decisions, we do pull a lot of input in from a lot of places. We are not a gate that you have to go through.

We are a fact finding filter, if you will, that provides a little bit

deeper than I would call a sanity check. We are doing a real good, science centered, technical approach integrated to the review. We want to find the gaps in understanding of the staff and the applicants. We want to find where there is flawed, or maybe incomplete data being used.

And we want to see if there is a lack of integration amongst the staff and the applicant, taking a look at these very complex machines. Our job is to make sure that it is done right, and that is our high level purpose, we give you a comment or a recommendation, we want to be informed, and we want to be technical.

Next slide please. As you mentioned, there has been a lot of pretty good letter reports written, I am not going to go through a lot of detail of these. Again, if you have specific questions I'll be happy to answer the technical aspects of it. We want to make our letters stand on their own, and be clear enough so that the safety case, and recommendations are clear.

Not that they are going to be voluminous, but there is going to be enough information in there so that the reader doesn't have to open up the PSARs or any other documents that go after. Next slide please. One interesting area that I will talk just a little bit about is the aspect of reauthorization of power operations for these plants that have ben in safe store.

We just want to compliment the staff, they did an excellent job on putting together a process that will be able to put across other plants. It is a very small population of plants that are eligible, but we feel very confident in the process, and the people involved in that, and we can see that playing

out very well.

As far as the Seabrook ASR issue that has been going on for years, we kind of put that to bed in our minds by making a site visit, interacting with the applicant, having a public meeting, and recognizing that they have got a handle on this. The staff has got a good oversight plan, they have got the right expertise looking at it, and the applicant has both corporate and site support with a lot of margin in these big buildings.

So, we feel pretty confident that we are in a good place on that, and I just wanted to put that behind us, because that was referred to us by you, to ensure that that is taken care of. Next slide please. As you mentioned, the ALS is an important topic, important to nurture, to let's see where it goes, because I think it could really, ultimately could be the end of the large break LOCA issues that we have been dealing with for many years.

And it is very costly to find a plant around a large break LOCA, but if you can eliminate from the design basis, if you can eliminate the concerns with large break, that will go a long way in the large light water reactor world. You also mentioned Part 57, comments we made on that were more recent, and informed, and I think that the staff, and us, and the ACRS elaborated very well on that rule.

When I say collaborate, that doesn't take away from the independence, that means that gets back to this one team effort that I have been talking about, where we are in here all to get it right, not to make one part of the agency look better than the other, or bring me a rock and I'll let you know how you did.

That is not our attitude anymore, it shouldn't be anyway, it is all about getting it right. Next slide please. Some of the items that we issued prior to the executive order that we probably would not be looking at now because we developed a screening chart that really focuses us on the safety significant, unique, novel, and noteworthy, it focuses on the statutory requirements, and anything that you might as a Commission refer to us.

So, that screening makes us talk more about in a collegial manner whether or not we need to review a document or not. And when I first came on the Committee five, six years ago, those conversations took a long time, because everyone reviewed a document to determine whether we need to review it or not. So, now we focus it in on one subject matter expert.

And that subject matter expert on the Committee develops a recommendation, and then we talk about it. And that in itself focuses, and gives us a lot more volume, if you will, that we can do it. Because now we can talk about five or six documents a meeting that don't need to be reviewed, as opposed to having less review time, and more discussion.

So, we are taking much more advantage of a subject matter expert on the Committee to give us good recommendations. Next slide please. So, over the years we have been implementing lessons learned. I mentioned earlier that you can follow our '24 and '25 presentations, and see that they have been less technical, and more process, organizational fine tuning aspect.

We have been reinforcing the culture of continuous improvement for quite awhile, and when I came on the Committee, again, five

or six years ago, there were 12 people on the Committee, and a lot of the work was done by tribal knowledge, because this is how we used to do it, and personally I got confused, so I started writing it down, what was happening.

And it turned into 26 some pages of guidance on how we do things. That kind of spawned with several of the other members, a push to have internal retreats, and discuss what are better ways of doing things. And we had a series of those, brainstorming, and types of other things, the standard way you do things, facilitated to get to a point where we were on a path to make it much more efficient.

So, in '25 when EO 14300 came out, again, that was the burning platform that really said we're on the right path, but we've got to get going on it, we have got to really start moving faster, and in '26 we continued the refinements, because we're all as an organization talking about how can we get more efficient, how can we do better, how can we maintain the levels of safety, maintain rigor, but do it on a schedule that is a little bit more compressed?

And we have been feeding on each other, the staff, the Commission, everybody is kind of feeding on each other, ways of doing it, and we have been implementing those, and we have also listened to the external organization's comments. I mean, we have gotten several reports where ACRS has been mentioned, and we do read those, and make sure that we understand what is the heart of the matter, and really attack it.

So, the next slide. And chairman, you have been in the industry, you get a key performance indicator and you can make a story out

of it, I don't want to gaslight you and say look how great we're doing, we're on a downward trend. Because there is a lot of things that happened there, there is a lot of things that yes, we are getting better and more efficient.

But there is also some big things behind us that we have done, we have done Part 61, we have established an operating license for Shine, we have done rules 50.160, numerous reg guides, Kairos, NuScale, I mean I can go on to say that there has been a lot of very technical topics that we have done, but we have been doing more focused on safety.

So that the volume although is high, the number of things that we're actually writing on have been coming down, the number of meetings we have have been coming down because we have been spending that focused time ensuring that we are staying right on track.

Next slide please. So, as I mentioned, we are going to go through some technical lessons learned with Dr. Petti, we will go through the safety case, discussion on why we are going to get more efficient, and then we will go into the process lessons learned with Dr. Harrington, and then I will close at the end. Dr. Petti?

ACRS VICE CHAIR PETTI: Thank you. Good morning. I would like to talk a little bit about some of the lessons learned from a technical perspective that we have seen across a number of reviews. Next slide please. So our purpose is to reflect on those lessons learned, particularly the new applications, yet still ensuring that we meet our statutory responsibilities, and we enable the safe, timely, and efficient deployment of nuclear energy.

Thereby reinforcing NRC's leadership and reputation. Next slide. In terms of what I call the scope and the boundary conditions, the advance reactor reviews, the completed ones that we looked at NuScale, both the US600 DCA, and the US460 USDA, Kairos Hermes and Hermes 2 construction permits, and the TerraPower Natrium construction permit at Kemmerer, Wyoming.

Ongoing reviews, Long Mott X-energy, Xe-100, and we just yesterday finished our review of Clinch River BWRX-300, so that letter is imminent probably to you guys. And then there were a number of pre-application topical reports from additional vendors that are just starting that we had. And of course the evolving policy direction always in our mind, the ADVANCE Act, the executive order, and your direction and review efficiency and focus.

Next slide please. So, what were the key observations? Is that our reviews have become more safety focused, streamlined, and efficient. Our integrated safety case reviews compliment the staff compliance based reviews, they are not duplicative, and we will talk more about that. And I think you will see when we get into the details why we say that.

What we found is that these parallel reviews, us and the staff doing them in this new manner enables on schedule early completion. We'll talk more about that later. Application quality strongly affects review efficiency, as you probably are well aware. And detailed topical reports that really underpin the safety case are really important for some of the unique

technologies that are presented, and we will talk a little bit more about that later.

Next slide please. So, as I said, we really started this continuous improvement with the NuScale DCA, if you go back and look at the lessons learned, we had some seeds there planted. It was accelerated by the recent ADVANCE Act, and EO 14300, and Commission direction. And again, the increased focus on safety significant features that are unique, novel, and noteworthy.

Craig will talk more on UNN, and I will talk a little bit more later on what we think of UNN. Next slide please. So, we grouped the lessons learned into three areas, the development of the safety case, the actual licensing review process, and then technology specific issues that affect how you look at these safety reviews.

I would say we presented the results generically without any specific applicant or staff to both protect the innocent and the guilty. Next slide please. So, in terms of safety case development, it's really all about transparency, and safety margins in our mind. The safety case should be clear, it should be complete, and it should be transparent to reviewers and the public.

We have had cases where that isn't the case, and we have to work hard to try to get together that coherent safety case. You will see sometimes appendices to our letters where we kind of line out it is this, this, this, and this that put it together. You can't find that easily in the 1000 page PSAR, but we think that's where we can add some value.

We can lift it up, condense it, and make it very coherent for people. We also think that the safety case ought to be explicit about safety margins, particularly on the advance reactors, where you just don't know as much as you think you know. Uncertainties that drive the need for margin, and any compensatory measures that you are going to be taking for the limited operating experience.

One of the concerns that we do have in the transparency is that we have seen applicants come in and make too much proprietary. So, you cannot, it was one of the most difficult letters we ever had to write because everything was proprietary, we had to stand and go look at what was on the screen, and not be able to talk about it because that's proprietary, and we're in an open meeting.

So, that is difficult for a FACA committee like ours. But that is isolated cases I think. Most of them, some are completely open, what I call open kimono, others are kind of in the middle. One of the things we want to talk about is that some of these applications will take departures from precedent, and we think that a major departure from any historical approach really requires early explanation with a strong technical justification.

What we are looking for is the technical rationale, why do you think that that deviation makes sense, what is it about the technology, so that we can assess that. And that clarity helps improve the licensing efficiency, and reducing the risk. We have had cases where it wasn't clear, in the written documentation it wasn't clear, you had to go back and look at the transcript, they described it all, but it isn't in the written record.

And again, so we had to actually step back a couple times and say okay, let's make sure, because it's not in the written record, that we've got it, we've got the story. Next slide please. So, let me talk about how we do this integrated review strategy. We do a top down look based on the safety functions, control, contain, confine, the classic IAEA three.

And if there is another one, some of them have a fourth safety function, of course we look at that. Then we do a bottom up evaluation, are there new fuels, new coolants, new materials, new configurations, unique valves. There has been some really interesting valves that you see coming through. Those are the things we look at that are UNN, because they will drive some of the safety case.

This sort of top down, bottom up approach really enables a holistic safety assessment. And what we found out is that it actually takes less time, and allows greater focus. Again, to reiterate, it's a diverse approach relative to the staff's review, it is not duplicative. Let me talk a little bit about the one area where we have seen some things that are a little concerning, not always, in rare cases, the principal design criteria.

There has been inadequate justification in modifying or deleting principal design criteria. Some vendors, absolutely great, very clear, very succinct why, it makes sense, but in others it isn't very strong, it weakens defense in depth, it increases accident risk, and particularly when you have got designs where you have got limited data and no operating experience.

I think you can obviously come up with different approaches when you've got a more mature technology than something that's really new,

that is going to take more looking. Next slide please. So, let me talk a little bit about a construction permit versus an operating license or a COL. Mostly we are seeing construction permit applications, but NuScale obviously was a COL.

We find that many of the applications lack the detailed analyses, even more so than a PSAR from the existing fleet if you go back and look at their documents. And so the burden shifts to the operating license, particularly for the less mature technologies. There is just a lot of outstanding development work that is required to be done, the staff usually notes that, and keeps track of that, we are keeping track of that.

And so when you get to the first of a kind OL, we think it's going to be a more intense review than the CP, it may require more resources to hold the 18 month schedule commitment. WE still find that pre-application engagement is critical, it helps reduce licensing risk. We find that technically complete topical reports add a lot of value, we have seen some very good ones.

But there are many that are, we would call them concept only, a plan for a plan is another word we use, that there is just not a lot there, and the staff has to go through and write a tremendous number of limitations and conditions because there is just not enough there, and it takes their time, it takes our time.

And in this new environment, that is inefficiency that we just have to be aware of. Next slide. We have seen now some applications with TICAP ARCAP, and we think that the applications themselves really need the

results of the hazard and accident analysis in the document like the old chapter 15, it's not required by the actual outline of TICAP ARCAP.

So, sometimes those results are in subsidiary documents, and so that is an audit burden on the staff, and we can't see the safety margin easily. Again, TICAP ARCAP, yes, you have got to make sure all your data points are below the frequency consequence curve, but there is other safety margins, and other acceptance criteria that we want to see that help inform our engineering judgment.

The fact that your dose is less, but I want to know how close you are to a temperature limit, a burn up limit, a dose limit, something like that. That is deep down in the details, because we know that some of these systems can push some of those limits, and that is what we are kind of looking for, and so it just takes more work.

And so for us with the staff, we have to now be kind of very sensitive, to say we're going to need to look at your audit report, so it has created a new dialogue with the staff that we're working on. We have seen significant variability in the quality of the application in terms of the technical depth, and the completeness.

And that is really just based, it is a function of the maturity of the technology that you are sitting on. We find that high quality applications obviously enable streamlined reviews, and it reduces the burden on the staff and the ACRS. One of the things that we know, because TICAP ARCAP is knew, that there is a struggle, the applicant is trying to put as little on the docket as possible.

But we are trying to get to a clean understanding of the safety case, which sometimes requires details, and it is that balance that is the learning process with TICAP ARCAP that we're seeing. Next slide. Now let me talk about some good things that we've seen, and we've seen a lot.

The licensing modernization project, that approach helps focus on risk significant structures, systems, and components. As some of you know, I have presented on Part 53 on this, I am a huge fan of this, it came through the next generation nuclear plant project that I was part of. But what it has done is that it has caused the design to change.

If you look at some of the advanced reactors that are in here now, and you look at their sister designs from 15 years ago, they are different because LMP found a vulnerability, and they said we have to address this, we have got to put it in a new system, or we have got to make this more reliable.

I've argued it isn't as much about doing the PRA with the numbers, it is that strength in the design that's a huge lever to improve safety, which is really what we're looking for. We have done some delta reviews, Kairos is the classic, but also NuScale, and its two, very efficient for when you've got small changes.

We've seen a redline strike out for the PSAR, what an incredibly innovative idea to -- not another great news, right? But it helps you really see where the changes are, and really help you focus. Another new methodology that we have seen is something called lines of defense comes out of the French and the IAEA.

It is a systematic safety approach that you can use in a

deterministic sense, but you are incorporating risk insights, but it causes you to look at every system, every safety function, and look down and say do I have enough defense, do I have a vulnerability? So, it helps, is the safety function adequately integrated in the design?

Do I have enough defense in depth, what about residual, there's cliff edges, it's always a completeness issue, this helps you identify and put a fence around some of that, and again, PRA completeness. So, this does the same thing as LMP, we have seen a couple of lines of defense approaches, and there are changes that they told us they made because of that approach to make it safer.

They found vulnerability, really good on the design side. Next let's talk a little bit, next slide, the technology specific impacts. We still think, obviously, that there is need for experimental confirmation, the computational tools alone are insufficient. There is this sort of sense that belief in computer codes, we're still old enough to believe in data to really back that up.

The documentation in the construction permits have a list of required research and development, we think that is essential. It is called Appendix A, at least in the Kairos, what is that punch list, because if the OL is a long way down, it may not be the same us reviewing the OL, and maybe our future members, similarly the staff.

I mean, if you are talking a really long time between CP and OL, making sure that there is something there for them to know, the tentacles, where to start the review. We also see though that some of the safety

attributes really you can't answer the questions until you enter startup testing, and having the operational data, that's just it.

I want to say that technology matters. Each of the technologies have different safety concerns. Liquid metals, it's really about nuclear reactivity, and fire risks with sodium. In molten salts, the redux control, which is how you control corrosion chemically, and making sure you don't freeze the salt, it's a high temperature coolant, it would be a bad day if it froze.

With gas reactors everyone thinks it's about the fuel, TRISO fuel, having been involved with it, I am not as worried about that, there are materials issues because of the temperature that you have got to make sure that you keep your eye on. So, what we are worried about is the direct application of LWR guidance.

Which is so focused, frankly, on thermal hydraulics in light water reactors, and what their issues, make sure you don't lose this focus here, this is where you have to look at, it isn't always about what historically has been the issue, which is thermal hydraulics. Next slide. So, let me talk about one of my favorites, Reg Guide 1.203, which is how you structure an evaluation model.

Its history came out of LWRs, CHF, power up rates, you are sitting on the edge, how do you know, what is your margin, you've got to have the sharpest pencil you can, and how do you know your experiments really represent reality? So, there is a huge amount about making sure you have good thermal hydraulic experiments in two phase flow.

That is not where advanced reactors are, right? And so you have adapt, not adopt the details. And so when I think about it, the staff kind of has to work backwards, you have to look at what that reg guide says, which is way down here, and go okay, what is the higher safety issue that you are trying to resolve?

Raise it up, and then ask yourself does it make sense in the context of the safety functions of that design, the safety margins, and the risks. And so it is a different thought process, but it's not compliance based, it is much more about thinking about what this design means. And we are seeing, in some parts of the agency, this thinking happening, but not necessarily in all parts.

Let me give you my two favorite examples. One week we're in subcommittee, and we had a legacy vendor come in, improving the physics parts of their analytical tools. They had 100 or 200 benchmark cases that they were comparing their code to, everything was within two percent, perfect. And then we get one of the advance reactor guys come in, well we kind of have three and a half criticals, benchmarks that we can do.

You can't just say well, sorry, you can't go forward because you don't have enough. You've got to think okay, so if they miss on the criticals, how bad is it, what does it really mean in the bigger safety case? The other one is all this thermal hydraulic scaling. We had one vendor who looked, and did the assessment, and they have four or five historical operating reactors around the world, and they have real data from those reactors, but they don't scale to their design.

And I'm like so? That is real data, I would really like to see the computer codes fight against that. But then the question is well to meet that reg guide, I have to build a million dollar facility so it's scaled. For sodium there really isn't an issue about that it can remove heat, we know it can remove heat, that is not the issue.

So, those are the things that I really worry about deep down, I push the staff on it, and I said look, isn't it about safety margin? If there's a huge margin in their heat transfer, do they have to meet the actual letter of the law, or do they have to meet the intent? And so we are working with the staff to try to get them to start to think those ways.

Those are some of the things that at least I worry about in the background. Last slide please. So, let me talk about our commitment to you in our reports, Greg had mentioned it. We try to outline the key safety issues, we provide timely evidence based recommendations. We try to be thorough, technically sound, and we are focused on the safety, the rigor, an the completeness of the licensing action.

We are consensus based with the advice of experts, and I can't talk enough about how the actual collaborative process, which people go letter writing is awful, it is the way we achieve consensus, because you talk out issues, and you bounce off ideas, it is messy sausage making, but it works.

And again, we try to have clear and well structured reports for you, but there is always the public listening in. And we almost always, they don't understand sometimes, of course obviously a lot of the technical issues, but they are always very appreciative of the ACRS, because what they

see is us challenging the applicant, challenging the staff, there is some due diligence here, there is some rigor.

And finally, in terms of our role, we see that we do have this enduring role, these advanced reactors, they present new but really familiar challenges in a different context, given where we are today. Safety still remains our highest priority, and that is our focus going forward. So, with that, let me turn it over to Craig.

ACRS MEMBER HARRINGTON: Now we will transition to the actions that we have taken in response to both the lessons learned, as well as Executive Order 14300. The ongoing reforms part of this set of slides will speak to how we have formalized the changes, and then in the evolution of processes part, I will talk at more length about our day to day implementation.

Next slide. Our narrowed focus on statutory obligations has been formalized in several ways consistent with Commission direction in implementing the executive order. Next slide please. We have adjusted our membership, and our subcommittee structure. We revised our bylaws, and we have updated our annual operating plan accordingly.

Later this year, after the direct final rule on ACRS is published, we will update our charter, and the coordination MOU with conforming changes primarily. The ACRS staff has updated our web pages accordingly as well, and are developing a set of online tools that parallel similar tools in the NRC staff that will facilitate and help communicate ACRS activities.

And at the bottom of this slide there is an issue review checklist, and a design centered review guidance document, which they serve a formalization role in writing down how we do certain activities, but they are very much involved in our day to day implementation, so I will speak to those a bit more in subsequent slides.

Next slide. The evolution in our processes is demonstrated in our day to day implementation and activities. And I will highlight the screening of unique, novel, and noteworthy issues, UNN in our shorthand, how our current review process, as Dave has mentioned, is we think, complimentary to the staff review, not duplicative.

And then how those two areas influence, or have impacted our design centered reviews in a bit more detail. Next slide. Immediately after the executive order we developed an issue review checklist, it is a flow chart with accompanying detailed guidance that first applies the statutory obligations test, and then seeks to identify the UNN elements for emphasis in our review.

There is a link to that flow chart on our web page for external stakeholder visibility. We apply that screening process to licensing actions, topical reports, and safety standards that are being considered for review by the Committee. That criteria helps guide our review decisions, helps define our review scope, and then is instrumental in designing meeting agendas to cover those topics.

That screening process is also embedded within our design centered review activities, and notably for those licensing actions that would

fall in the Nth of a kind category where there has been a prior approval of some sort, that UNN identification process would screen out those elements of the safety case, which have already been reviewed, are well understood.

And it would retain for further review and emphasis, those elements which are screened as UNN, which basically would be elements that have been added, or have evolved in some consequential way since that prior approval action was completed. So, in that case they would have not really been reviewed before, and they would still be within what we would consider our purview.

So, next slide. We are now carefully focused on the safety case and its adequacy, and the safety case really consists of the three fundamental safety functions. Control of heat generation, control of heat removal, retention of radionuclides, and that's supplemented by defense in depth measures. It is noteworthy that the control of heat generation topic is typically synonymous with control of reactivity.

But the broader terminology there is reflective of possibility in some of the advanced reactors, that there may be additional non-nuclear exothermic reactions that have to be accounted for. And that list of fundamental safety functions may also expand depending on the complexity, and the content of a particular reactor design.

It is also important to clearly describe the distinction between our holistic safety case review, and this focus on UNN elements. Safety case is typically broad, and it touches on many aspects of the plant from design, construction, maybe siting issues, operational issues, amongst

others. Our holistic review then considers the entirety of the safety case to make sure that it is complete, that it is rigorous, and to assess its overall credibility.

However, that safety case consists of many elements, some of which may be well understood technology previously reviewed, and some of which may screen as UNN. As we review the holistic safety case, those elements that are well understood, previously reviewed, we would evaluate their function within the safety case, but really wouldn't significantly typically challenge the technical details of that function, of that element.

However, for the UNN elements, we would do a deeper review in sufficient depth to establish credibility that that element can in fact perform its role within the overall safety case. We consider this holistic safety case approach to be diverse from, as Dave said, and complimentary to what the staff, their staff review that is performed on a chapter by chapter basis, has a higher structured, and compliance based aspect to it.

However, this is an efficient approach that robustly satisfies our statutory review obligations, and we conduct that in an independent way, but with appropriate cooperation and corroboration with the staff. Next slide. Until recently, our reviews were also largely conducted in a chapter by chapter manner.

That resulted in a number of meetings with the applicant and staff, it also typically fell late in the overall NRC review process, once the final safety evaluation report with no open items was available for public discussion on at least a chapter by chapter basis. Our current process has resulted in

a significant reduction in the number of those meetings, and I will go into more of the detail and steps of the process in a bit.

But the earlier start of this more parallel approach also facilitates early identification by the Committee of significant safety issues, or questions, or concerns so that there is ample time left in the overall NRC review cycle to ensure that those things get resolved in a timely manner.

Next slide. This table highlights in a small number of examples, how the evolution in our process has impacted the investment of time by applicants, staff, and the ACRS in public meetings, in terms of meeting days. We generally expect that our ongoing, and future reviews will align with that trend toward a smaller number of meetings.

However, we have carefully not established arbitrary criteria for the number of meetings, or meeting days for a given application, and our focus instead is a thorough inquiry, but to complete that in the minimum number of meetings necessary to get there. Next slide. So, our current process is really exemplified in the recently developed ACRS design center review guidance document.

This document is also posted to our website, and we provide it to applicants to convey ACRS goals for the scope and content of our fact finding meetings as applied to their particular application. The guidance explains that, and when we first meet with the applicant we expect a robust plant description, and a careful exposition, thorough exposition of their safety case.

We hope that they will do that in, as kind of Dave alluded to

earlier, in as transparent, and as non-proprietary a way that they possibly can. We think that is both, well it is very helpful for us in our deliberations and letter writing, but it is also critical for public understanding of why is this plant safe.

Subsequent topics would then focus on the fundamental safety elements, the fundamental safety case, and the treatment of defense in depth measures and an appropriate level of depth relative to the scope and attributes of the UNN elements in the design. We then wrap up with a final meeting to assess that we do understand the safety case, and that all of the technical issues have been resolved.

That all may be done in one or two meetings when the technology is well understood, as has been the case with the Clinch River CPA that we just completed. Or it may involve a modest number of additional meetings in cases where the UNN elements are more extensive. So, once an application is received and accepted by the NRC, we begin our review in parallel.

We review the safety case, we identify the UNN elements that we at least initially believe are there by Committee consensus, we meet with the staff in a short, informal, non-public engagement just to look for any major disconnects, and that we are seeing the same kinds of things, and then we proceed with our evaluation.

We work with the applicant to carefully define a series of meetings, an appropriate number of meetings, and the content and scope of each of those to support our fact finding activities. We will communicate with the applicant or the staff through the ACRS staff when we identify questions

or points of clarification that we intend to pursue, the goal is not to have got you moments in meetings.

But to make sure that we get the information that we need, and that applicants, or the staff come prepared to address those topics that we think are important. We then will hold a meeting with the staff once the final SER with no open items is available for public discussion, and make sure that we understand their conclusions regarding the application.

We complete our letter report, and our review is done. We do not formalize, but we often reflect through that process on what has worked well, what could still be improved in a continuous feedback learning loop. So, next slide. In summary we have formalized our statutory obligations in documents that define the ACRS, and describe our work.

We have revised our processes consistent with this narrowed focus to still produce rigorous, scientific, fact based conclusions consistent with our statutory obligations, and we think we have made a good start, but we are continuing to look for opportunities. Limited amount of time for you.

ACRS CHAIR HALNON: Thanks, Craig. You can go onto the next slide. I hope that through the presentation you have heard a spirit of flexibility, adaptability, corroboration, and that is going to manifest itself into what you might see us here during non-traditional committee weeks. We have clearly communicated to the staff that if you need a special full Committee, we will setup a special full Committee.

Our time is, we are part time employees, we have a limited

number of days. Today, because we have a limited number of applications we have the flexibility to flex our schedules as well, and we do that. When we get a lot more volume and what not, we'll have to figure that out when we get to it, but we are working on making that more efficient.

So, that is a piece of all of this. IF you go onto the next slide, I mentioned a little bit earlier about leadership, craftsmanship. When you are steering an organization, you have to have a shared vision, you have to have high values, and you have to have alignment on all those. This picture is just a thumbnail if you will, it might look like a containment.

We have our shared vision around the outside, we have the foundational documents underneath, and we have our values, that is the cover page to our leadership model. If you go onto the next slide, those values and visions are reflected here. This is the true alignment tool, which it starts from the very top, and works your way down from the what to the how.

And when you align on the how, and you talk about it, and you spend time discussing whether or not it's sufficient to use that how, you can clearly make it a lot more efficient. So, that is what we do. Each one of those lines on the bottom will have a paragraph or two, and we will collegially talk about it, ten minutes or something to that effect.

Not a lot of time, but enough time to align, and get each other's view on what that means to me. So, the last slide, in summary, our job again is to independently reach conclusions and recommendations, and provide advice to the Commission. We won't do that on a fragmented or incomplete basis, we want you to have confidence in our letters, our

recommendations, that they're well based in science, based in technology, based in good experience.

We know we must collaborate with the staff, that doesn't mean we lose our independence, it means we have a continued line of communication with the staff, if we have an issue, we give it to them, so they may have already looked at it. So, why put it on our docket, and go back and forth? If it's resolved, it's resolved, move on.

In all of this, we have to again, focus on that safety case, the margins, making sure that the integrated plant is safe. We will embody this one team effort, which is we are not the enemy, we want to be part of the process completely to get these schedules met, and be efficient. We will proceed with caution, but we must proceed. I turn it back over to you, chairman.

CHAIR NIEH: Thank you, Greg, and thank you to our presenters for the informative information today. Going first with questions today is Commissioner Weaver.

COMMISSIONER WEAVER: Thank you, chairman. Good morning, and thank you to members of the Advisory Committee for briefing us today. The Committee's independent and technically rigorous insights are essential to achieving the agency's mission. The recent letter, and the chairman mentioned this also, on the proposed Part 57 demonstrates the value ACRS delivers in clarifying complex issues, providing insightful recommendations, and strengthening the quality of our regulatory decisions.

I appreciate the proactive steps you've taken to refine ACRS

processes and the scope of review. These changes have already improved both efficiency and focus, which is especially important in a period of increasing licensing activity. Your recent lessons learned letter is not only in the spirit of continuous improvement, but also contains actionable information for the staff and applicants.

Dr. Petti made a comment about messy sausage making, we know a little bit about messy sausage making on this side of the table as well. I have a goal of asking three questions, and a stretch goal of four, so I'll see if we can make that happen. So, when the Office of New Reactors was formed 20 years ago, there was this design centered review approach.

Which really meant design certs and COLs, you review it once and that's it. As I think about your work, and you mention a design centered review, I am wondering would it be better to think about it in terms of sort of a technology centered review, as opposed to, because how many times are you going to see the same design once it's licensed, and you've dealt with all the UNN on that design.

Are you going to see that again? But you might see another liquid metal reactor for example.

ACRS CHAIR HALNON: Commissioner, I think from a process perspective we didn't separate those. We see typically the technology comes in first, because the topical reports are very technology specific, and those morph into okay, now we're going to put it on a site, and it's more of a design centered. So, I think that we didn't parse those words much.

But I think your direction is correct, and I think that we will take another hard look at how we frame that committee to make sure that we are not too siloed on a design, and thinking that we have to continue the design piece. It is a technology, and by matter of the fact that we have different subject matter experts kind of necessitates us looking at technology rather than design.

We have a couple of generalists, like integrated plant operations type people that will look at a design as a whole, but for instance our solicitation that we just went out for is looking for someone that is very technology specific in the fuels and material fuels area, certainly is technology specific.

COMMISSIONER WEAVER: Thank you. I am going to change direction here. I think everyone knows there is some interest in reprocessing, which I think by definition would fall outside of your scope unless the Commission were to take a look at that. If the Commission were to give you, look at certain factors on a reprocessing facility, do you have the staff, do you have the right technical mix to be able to perform such a review?

ACRS VICE CHAIR PETTI: Yeah, I think we have technical capability in the Committee, and in some of our consultants, but in terms of some of the real deep dive stuff, some of us know people who have worked at the labs, and are really well knowledged on this. And we have talked to ourselves about well, we'd probably bring in that other consultant for the real deep stuff.

COMMISSIONER WEAVER: Thank you.

ACRS CHAIR HALNON: Just to carry on, you do bring up a good point about our full time ACRS staff behind, we have some staff engineers, and we would need to have some training, and potential beef up some of that staff to make sure that initial, full time look at these things that helps us to focus on the UNN is there for us too as well.

ACRS VICE CHAIR PETTI: And just we've done that training on the reactor side before the Kemmerer, a liquid metal reactor, and we had Argonne come in, and all the labs have slides on this sort of stuff, training, different people, just to bring everybody up to speed, so we do some of that as well.

COMMISSIONER WEAVER: In discussion on construction permit versus operating license, and the level of review, and looking for UNN, and you brought up in your briefing, well there could be also a time lag as construction goes on, and I think there is a possibility that the design could morph a little bit, and those areas that when you did your first pass, maybe there wasn't complete information, or maybe something has changed.

So, how does your process make sure when you're looking at the operating license, that you didn't miss something because of a change, or there wasn't sufficient detail?

ACRS CHAIR HALNON: That is something that we're also, I wouldn't say concerned about, but we are focused on. In fact we want to see the same type of questions being asked by the staff as well, because they are certainly coming up with a lot more issues, in the past they have put

some things as an appendix to the SER so that issues in the SE that they have gaps on, if you will, expecting OL information would be carried forward.

I think they are keeping that in a database now, we queried that on the Clinch River project the other day to make sure that those areas that they said are being promised in the OL are there. Our letter reports, we are trying to put the big picture issues, the highest, most significant issues in there, in the body.

So that when we get to the OL, the first thing we're going to do is go back and read our letter reports from the CP, and that will refresh us on that. In addition to that, again, our full time ACRS staff, technical staff will be maintaining a website. We have reorganized the website to be much more coherent in maintaining these things so that we could easily go back and take a look at it.

So, there may be a little bit more research up front to get a little history, and that will facilitate a much more efficient review, rather than reraking things that we may have already done. Because most likely it will be a different member working on that.

COMMISSIONER WEAVER: Thank you for that. We talked, you talked at some length about process improvements, et cetera. How is the ACRS measuring your success, and process efficiency, how do you think about that?

ACRS CHAIR HALNON: Well, that is a good question, because we have taken an attempt at getting performance indicators, or looking at different things, and everything is so unique that comes through,

different levels of detail and what not, our first measure is did we meet, and are we working with the staff to meet the schedule, to get it out.

Are we getting out an efficient letter report that is timely? And right now I say we're meeting those, but we have tried to do performance indicators, and I have always had this concept that if you create a tool, or a performance indicator, if it stops working for you, and you're working for it, it's no good, and that is where we have come in that.

So, we would hopefully rely on our external input from the staff, from the Commission, and others, are you hitting the mark, are you adding value, are you continuing to get better at what you do? We do have some, have had self, and continue to have self reflective retreats. In addition to that, what I'm planning in the fourth quarter is what I call an organizational gap analysis.

Okay, I am going to take all of these things that we have done over the last couple of years, I'm going to train a couple of observers, and take this leadership model, and say go back, you observe two or three months worth of meetings, you take all these things that we've done, and maybe we'll make a checklist, are we meeting what we say we're going to do?

Where are our gaps, and what do we have to fit, and do better with, either with the process, or the behaviors informing the process? And I think that that gap analysis will help tell us whether or not we are meeting the mark or not.

COMMISSIONER WEAVER: Thank you. I met my mark of getting my questions in, but let me just make one comment. On the staff,

and then as a member of industry, I think ACRS was viewed as you're running the gauntlet. Of course it came at the end of the process, so it was all time added on to the length of getting the license.

And I just want to say the changes you have made, I think are right on, and really happy to see the progress that's been made, and will continue to be made. So, thank you.

CHAIR NIEH: Thank you, Commissioner Weaver. I'm next, and I can barely contain and control my enthusiasm for this discussion, because we are talking about nuclear safety, this is why we are all here, it is the top priority for our agency, your Committee as well, and I wish I had more time to really dive deep into some of the things I've heard, and I'm going to get to some questions.

But really this is what we are all about here today, I love the one team model that you're conveying here. I really appreciate the leadership model that you've conveyed here, I like your new logo by the way too, it's really nice, we have one as well. And I was really pleased to hear that you're no longer in the bring me a rock mode.

As a former staff member years and years ago I was bringing rocks, and I love that you're reforming your operations here, and the results show that, I think the number of meetings to get to decision reflects that as well. So, and echo what Commissioner Weaver said, thank you for the reform efforts here.

The safety case, I love this concept, I really do, because that is really giving the big picture of what's important for safety. And I was really

fascinated by the discussion because when I think of other approaches around the world, the United Kingdom does this approach. The applicant prepares a safety case, and the regulator decides what is reasonable to achieve that.

They use a LRP, a lowest reasonably achievable for their safety outcome. So, when I think about the changes that we are making here, and our intense focus on safety, on what matters, we are shifting from very prescriptive requirements to very performance based requirements. And I think about what does the organization need to be able to make these safety decisions.

And technical competence and judgment are going to be very, very important, and I am going to see if I get to a question here. But seriously, because we are in this new era of reform, we are doing business so different from before, for folks that don't appreciate how different what the members here presented about ACRS, it is so different than 20 years ago.

I mean, it is remarkably different. So, can any of you share some thoughts about how we as a regulatory can perform better in an area where we just need to rely on our technical competence and judgment? Because we are no longer in prescription. Because think about this, we have got regional administrators, inspectors out in the field that may be looking at, I forget what term you called it, but let's say the eaches, the very narrow focus area.

And what you're doing is zooming gout, so I would love to get some insights from you on how we can perform better as an agency when we have to make tough regulatory decisions that stem from very, very narrow

areas. And I think this whole concept of a safety case, like what is most important, is really a valuable tool to do that. So, I would love to hear what advice you have that we can share with the NRC staff on this.

ACRS VICE CHAIR PETTI: Let me take that. So, to me, at least through the advanced reactor lens, you're going to have to use more engineering judgment. Which means that somehow you've got to move their minds from this checklist, right, PDC, did they do it? The reg guide said to do it this way, did they do it? The SRP says this, to thinking more.

We're all engineers, or most of them, it requires thinking, it requires judgment, experience informs that judgment. And so I have a concern that when you have been working one way, it requires a real mind flip, and then more importantly if it's not happening, management has to get involved. And sometimes it requires management's management to get involved, depending on what's going on.

I will tell you that my personal opinion, from what we have seen on the advanced reactor side, they get it, they are very open, they are very flexible. A little more concerned for our, let's call them the innovative light water reactors. Because you have got this whole existing framework, and you will see it in our BWRX-300 letter, we commented about it.

Look, they need the same flexibility as an advanced reactor, they shouldn't be penalized because they're a light water reactor. And it's not about the rules, it's about the interpretation and implementation of the rules. And we've told them step back, open the lens, think about this more broadly, because there is the organization that does the water, and then there

is the organization that does advanced.

There is going to have to be some cross fertilization I think, in whether that's done with the concept of communities of practice, that sort of thing, to get people to talk about it. The team concept is great, I really like the team concept on the reviews, that helps, but still.

CHAIR NIEH: And I love your point, Dr. Petti, about the management, and their role in this. And I know through my peripheral vision, I see the EDO sitting over to my right there, we are implementing a management model here at the NRC, right? We worked in the industry, I saw SNIPM (phonetic) as well, and all those best practices we've had, it's all about vision, alignment, and execution.

And I think part of our execution is what we really focus on in terms of the big picture for safety. Because that is how you get out of the woods when you get wrapped around the axle on very checklist oriented issues. So I hope, Mike, you're listening here, you kind of think about that as you're developing this management model.

I want to drill down on a couple things, and I am glad I've got four and a half minutes left here. You said PDC is inadequately justified in some cases, and it could weaken defense in depth, as well as cause increased risk, can you give me an example? You don't have to name an applicant or vendor, but just kind of make that real for me?

ACRS VICE CHAIR PETTI: To talk about it, it will be. This is also the vendor that made their PDCs completely proprietary, and we had some serious concerns about it, and this is the other issue, the staff didn't

agree with us. And again, there's still plenty of time down the road for the staff to say no, but our perception is it's better to do it up front.

If you really think -- they were going against accepted standards for that technology, developed by a consensus based body, and they were trying to go against that. With no operating experience in a brand new technology, and as we said in the letter, if you are here talking about Nth of a kind and you want to do this, I have no problem, but not the first of a kind.

The history of the agency, in some of the other technologies, they are doing some of these sorts of things, where they are taking innovative approaches to meeting PDCs, they have been proven in older units, and almost every unit in a sodium system they have gone through things. In the gas system there is certain phenomenon that have been proven in every gas reactor ever built.

Okay, now I'm a new technology, and I have no operating experience, and I want to do the same thing, but you haven't done the homework yet basically. You haven't proven that in a system of this size, which is a huge scale in the technology. And so we are just saying that may be a great thing to do down the road, but not in the first of a kind.

ACRS CHAIR HALNON: And let me just add, chairman, I have a simple way of looking at things sometimes, and my simple way is that you set a PDC, or set of PDCs, and you go design your plant to meet those. It feels like, and I do think that this is happening in some cases, that we are coming up with a design, and then force fitting the PDCs to match the design.

And in that respect, the PDCs are being changed to meet

the design, rather than under a good philosophy of does this really protect safety?

CHAIR NIEH: Yeah, I think with these innovative technologies, to me it is just so remarkable to see how paradigms are changing. There may be a case where that may be appropriate, so I wouldn't necessarily really rule out that thinking there. You mentioned TICAP ARCAP, and it intrigued me because Part 53 relies heavily on TICAP ARCAP.

Tell me more about the gap there, I know you mentioned that there wasn't enough detail, it is going to rely more heavily on --

ACRS VICE CHAIR PETTI: So, the classic chapter 15 accidents, the plots, right? The figures that the engineers read, and you get a real sense, it wasn't in the document, it was in subsidiary documents. And so again, it's not just about what the ultimate dose is in the Part 53 construct, it is --

ACRS MEMBER HARRINGTON: Subsidiary documents not in the record.

ACRS VICE CHAIR PETTI: Yeah, it's not in the record, because it's a subsidiary document that's out of the bowl. So it's --

CHAIR NIEH: But it's part of the reference in the application, or?

ACRS VICE CHAIR PETTI: It's probably cited as a reference in the application, so does that legally make it part of the record? That I don't know.

ACRS CHAIR HALNON: It's not on the docket, it's not with

the docket.

ACRS VICE CHAIR PETTI: Okay, yeah, so.

CHAIR NIEH: My interest is really we're making so many rule changes, and doing things in different ways, the guidance is going to be so important in how we execute this thing, and again, if you're pointing something out here that kind of concerns me to make sure, because this has got to be implementable.

We are doing all these rule changes, and if it creates either bottlenecks, or drag in the ACRS process or elsewhere, that could be a challenge as we seek to --

ACRS CHAIR HALNON: We don't want to indict the audit process, the audit process has been really good, and the staff has really benefitted from it, and they do a really great job at documenting, and audit reports, but that's all you get is the audit reports.

ACRS VICE CHAIR PETTI: We had another applicant though, their stuff was in there. So, again, I think it's just the newness thing that has to be dealt with.

CHAIR NIEH: Thank you. I am out of time right now, so Commissioner Wright.

COMMISSIONER WRIGHT: I would yield you some time. Good morning, thank you, chairman. So good morning, and thank you for your presentations today, and thank you for the work that you do as volunteers, it is noticed. And I want to associate myself with some of the comments that the chairman made, and I am going to add a little bit to it,

because it started under Walt Kirchner.

And that would be the changes that ACRS had started to implement as a body, and how you are going to review, and how you are going to organize, and it has followed with you, Greg, and you all are to be commended, it is noticed, and it is appreciated. And with that I am going to ask a couple of questions. I like the idea now that you're leaning in, and you are not playing hide the rock anymore.

That is a phrase that had been known around here for years, and years, and years, and it is noticeable that under the new mission statement, and the ADVANCE Act, and the executive orders, that you all are taking it serious. So, Greg, you referenced the new reactor design center review guidance again, that we all talked about a little bit.

So, as me and my team had looked at the guidance, each of the topics could basically require its own subcommittee meeting. And I am just aware that the subcommittee meetings can become resource intensive, and take a lot of time for the Committee, the staff, and the applicant.

So, can you maybe describe a little bit more about how the ACRS evaluates the level of subcommittee involvement and engagement that is needed for each review, so we're again, striking the right balance, which you have said you're trying to accomplish.

ACRS CHAIR HALNON: Yeah, thank you. Real quick on the subcommittee, in the past we had nine or ten subcommittees with differing assigned members to each one, so if you had a subcommittee meeting you kind of felt like you had to be there, and now our subcommittees are down to

three, they are focused around the statutory obligations that we have, and they don't have a defined member, they have a defined chairman.

And that chairman goes and picks the subject matter experts he or she needs to establish what focus they're looking at. Now, the design centers, the reactor applications coming in, it's all hands on deck, because all the subject matter experts are needed for the entire piece of this. We have anywhere from seismology, to neutronics, to materials and fuels, and all of those as part of this.

We have been talking a lot about before we schedule a meeting, is it respectful to the applicant's resources, is it respectable to the staff resources? So, we have utilized, from a staff perspective, one hour phone calls to establish a question. As opposed to in the past where we would schedule a subcommittee to discuss a document.

We said well you only have one issue, why don't you just give them a call and talk to them? And that is that one team effort, and that has subverted a lot of subcommittee meetings where we would have had to travel, and there is a lot of preparation involved, and stuff like that. We have also established engagements, rather than formal subcommittee meetings, which have streamlined the preparation.

It's just bring in your subject matter, we'll bring in our subject matter experts, and we'll have a conversation for a half hour, 45 minutes, that's all that's needed. And again, proceed with caution, but must proceed, don't let it sit.

COMMISSIONER WRIGHT: So, I'm going to kind of blend

some conversations here, because I really liked the idea, doctor, that if things aren't happening the way they need to happen, they're timely, or whatever, that management has to get involved, you were giving that in response to the chairman's question, which I really think is important.

That we as leaders, and in management, need to lean in on these things. Are you noticing that need really happening at ACRS? I mean, you had the on review that we've talked about here this morning kind of off the record, but in those situations are you getting to solutions? I'm not saying to a right answer, but are you getting to the solutions that you're looking for?

ACRS VICE CHAIR PETTI: Yeah, I think so. I mean on the advanced reactor side, most of the staff really get it, I mean when you get into the details of the SC you read it, you can tell, right? Again, for the light water, the innovative light waters, I'm just a little more cautious just because of the history that's there.

There is deeper roots there that may have to be uprooted. So, it's just to be more aware of that side of the house. I think there are some that clearly get it, but I'm not convinced that everybody has got it.

ACRS CHAIR HALNON: It gets back to the rigidity, given the light water side there is so many requirements and guidance documents, the SRP is huge, and the rigidity of that is not necessarily the same level of rigidity that's in the advanced reactors at this point. And that is a struggle, does it comply or not, well not quite, well is that good enough? You have that struggle there.

ACRS VICE CHAIR PETTI: We don't hold ourselves to all those rules, we're just trying to make sure that things technically make sense, and we always stop there. And there's obviously going to be conflicts, and then that brings it to the floor.

COMMISSIONER WRIGHT: Right, but you are also trying to get to an answer.

ACRS MEMBER HARRINGTON: Within the staff, the flip side of the chairman's question earlier is as you go to a less prescriptive world, then the challenges of treating everyone equally, and coming up with a consistent set of answers every time becomes a really critical part of it too, which is a challenging balance to maintain.

COMMISSIONER WRIGHT: Yeah, well that's a great segue into a question for you. So, in your slides you discussed the Committee's process for determining unique, novel, and noteworthy, or the UNN that you talked to. So, that concept feels a little bit, maybe at odds with the Committee's philosophy of reviewing the overall safety case. And I mean you touched on the relationship in one of your slides.

But do you feel there is tension there, and I guess when you -- I guess is there tension there in how the Committee can square those two ideas when scoping out their reviews? Are they -- I'm struggling to hit the right word here, but do you feel that there is some tension there, or do you --

ACRS MEMBER HARRINGTON: I think there can be. And of course this is still new enough that we're still working our way through that, and we may hit speed bumps along the way. But it's also not a one size

fits all, one time decision. We may have looked at a blue one of those in the past that was used in this particular way, but now it's being used in a different way.

And that aspect may be unique, novel, or noteworthy. So, it's not a one time decision, and then we will never look at that again because we touched it once.

COMMISSIONER WRIGHT: Yeah, I mean I know you're going to look and explore opportunities, and things like that for further process improvements and the like, so in that, I guess vein, are there metrics, or indicators that ACRS is looking at to measure success, and to guide maybe future reform? Or is this like a --

ACRS CHAIR HALNON: I think it's early on in the process to say we have indicators, or any indicators that would be meaningful at this point. But we do from a collegial perspective, you have one member that goes through and develops the initial UNN list, and then we collegially challenge it, so that takes the experience issue out of the picture, because the person is saying well I've never seen that before.

Well, five people have, so it's not necessarily unique. And again, when I mentioned the behavioral gap analysis we're going to do later on this year, I think that will establish a need for indicators to put the -- I mean it takes resources to keep those things up, so is there a need to it, or do we have a volume at this point where it wouldn't be meaningful at all?

And we don't want to do anything that's just not meaningful, but I think the next briefing that we have, we'll be able to give you the results

of that, and provide you with -- maybe withhold that question, because we've gotten a couple times about indicators, and how do you measure your performance, we need to do that, to do it in an efficient and meaningful manner is a real key there.

COMMISSIONER WRIGHT: To close real quick, I appreciate the work, and the effort that you're trying to get away from the old way of chapter by chapter reviews that may not have been necessary but you did them anyway, and to try to focus on the most safety significant stuff, and what matters, and what is important to use a quote from the chair, from his comments earlier. And it's appreciated, and --

ACRS VICE CHAIR PETTI: Commissioner, I would also say that the top down of safety functions, it's not just UNN bottom up only, and that is a check and balance as well.

COMMISSIONER WRIGHT: Good, okay, thank you so much.

CHAIR NIEH: Thank you, Commissioner Wright. Commissioner Crowell?

COMMISSIONER CROWELL: Thank you, Mr. Chair. Thanks to all our presenters today, and to all the ACRS members for what you do, and for being here. We missed you last year, so it makes this meeting even more important, and impactful, an da lot has transpired since the last time we all came together.

And I just say that from my perspective, I think ACRS, as the confluence of the ADVANCE Act, and the EO 14300 came together, I think

ACRS was on the ball, and reading that reform, and change was needed, and you were ahead of the curve in doing that. You have made significant changes in the way you do business, the way you've managed the Advisory Committee.

That being said, I don't think you get enough credit for that work that's already been done, and I say this because I think on this side of the table we all feel the same way, we took our lumps over the last 12 months until there was the epiphany that we're not the evil regulator that folks thought we are, we're actually doing a pretty darn good job, and we're making improvements.

Now, obviously we're a continuously improving entity, and that applies to ACRS as well, but as long as we do that in an iterative way as change demands, and as things come forward, we'll be okay. I'm going to, same goal as Commissioner Weaver here with three questions, and maybe four if I have time.

So, as a statutory committee with a statutory mandate, the ACRS has purview over both safety standards and reactor hazards. Can you give me a couple examples of what is in one bucket, versus the other bucket in terms of issues that review. Where does like emergency preparedness land?

ACRS CHAIR HALNON: So, there has been a lot of discussion about what is the scope, what are our boundaries, where do we kind of wander into areas that we don't have a real need to know details, business side is an obvious one. We have kind of gone through, and we have talked about in the design center, in the reactors coming in, we say

looking at the UNN and the safety case.

That same concept applies to reactor standards, and hazards of existing facilities. We look at the issue itself, from a reactor perspective we're looking at the safety case, and the systems that make up that safety case, and how you operate those systems. It may be by digital I&C, or it may be by an operator, both of them have to be qualified to be able operate that system.

To be able to either prevent AO events, or transients, deal with the transients, or prevent them from progressing into a design basis accident issue. From there we follow the source term, we follow the source term in the reactor building, outside the reactor building, wherever the source term is going to go, we're going to follow it until we've determined it's not a hazard to the health and safety of the public or the occupational workers.

And at that point we don't need to go any further. So, when you talk about EP, we're going to get follow the source term until it becomes not a hazard to the public, and that may mean that it's off site's responsibility, we have off site infrastructure with FEMA, and NRC, and local emergency, they have got that.

We don't need to go into off site evacuation plans, we have just got to follow the source term until we understand it.

COMMISSIONER CROWELL: Agreed, so in that context, just because ten minutes goes by quickly here, what about siting? There was some talk about geology today, and bringing rocks, I'm not into that either unless it's relevant to a site that has unique geology that we haven't built in

before, so what about siting issues?

ACRS CHAIR HALNON: Okay, well let's anticipate the question going forward, like an Nth of a kind siting issue, you're taking Nth of a kind, do you need to look at the Nth of a kind reactor? No. Do you need to look at how the siting geologies, if you will, affect the safety case? And the answer is yes. You have to at least establish whether or not you're within the envelope of the design of the reactor.

And once we get to that point, we don't need to look at it any further. So, the plenary envelope concept is an excellent concept, we can anticipate, or envision, not even have to look at it all because it's within all the boundaries that we need.

COMMISSIONER CROWELL: I think you talked about this, but I want to just maybe have you do it one more time for more clarity. But have there been any instances now, or do you foresee or project any where the identification of UNN, there is a divergence between what NRC staff sees as UNN, and what ACRS sees as UNN?

ACRS CHAIR HALNON: Go ahead, Craig.

ACRS MEMBER HARRINGTON: I don't know that we've seen that yet, it is certainly possible as part of that independent but reasonable degree of coordination and collaboration. If we do see those events, that's the purpose of that short, informal meeting, just to square that up. And maybe they're seeing something that we have missed in the documents, or vice versa.

And so we try to have those touch points to make sure that

we are reasonably well aligned, and if there is a disagreement, either we pursue it on our own as part of our independence, or we work it out so that everybody sees things similarly.

COMMISSIONER CROWELL: Somewhat along those same lines, I don't think this has come to pass yet, but it is worth thinking about. When an applicant or license action comes to the NRC for review that has previously gone through say the DOE reactor review approval process, how does that -- or how do you think that is going to factor into the ACRS review?

I can't even sit here and tell you today all of the elements of how we are going to do that, other than it's not going to be a rubber stamp. But how does it then proceed in the context of ACRS?

ACRS VICE CHAIR PETTI: So, I kind of see it as there is a lot of other types of information that come through the DOE program, all sorts of testing, this is just one more step. So yeah, I would expect that it would be useful, but I think we all know that operating a reactor on the DOE side is good, hopefully they've got lots of good experience, but the safety case is more than that.

It touches other things, the operation covers some of it, but not necessarily all of it when you look at all the chapters, so there is going to be things. And what I'm hopeful for is the informal NRC people helping DOE, that that's getting greater alignment, and clarity to ensure that the questions are being asked at the DOE stage that the NRC would say we would be interested in that, we might do it this way. That will help prevent big

disconnects I would hope.

COMMISSIONER CROWELL: And again, in a similar vein, pre-application work and acceptance criteria for license evaluation here at the NRC is a huge part of the process, people shouldn't ever think about it as the start of the process. You've got to provide a lot, and go through some rigorous work to have your application accepted for review by the NRC.

And I think that is crucial, because the ACRS review starts after acceptance of the review. Do you feel that acceptance review criteria, or the current acceptance review process by staff is sufficient for the work that ACRS then needs to do once an application is in house?

ACRS CHAIR HALNON: I believe that the acceptance process, which really touches on have you hit all the points that we need to review in detail, the key point here is that once it's accepted, what the staff is looking at is what we're looking at, so that we're not crossing paths in a space that doesn't make any sense.

So, if the staff thinks there's a big gap, and they don't accept it, we're not going to start reviewing something that the staff isn't going to be reviewing yet. We want to be looking at the same thing so that when we get to the end, if we have a disconnect, it's because it's a technical issue, and not a process issue, or something else like that.

So, directly, yes, I think it is adequate, and I think because what happens after the acceptance review is that we're all looking at the same document is the key thing. If we come up with questions as we go along, then again, it's a continuous conversation rather than wait for the meeting at

the end of the process.

ACRS VICE CHAIR PETTI: I would just say I sometimes worry about the opposite, that the staff will feel under great pressure to accept, and the clock starts when you accept. And if it's not where they think it needs to be, they're just putting more pressure on themselves to complete it in 18 months. And finding that balance, and being able to say no, this one really -- a good regulator, this doesn't meet the mark yet, we need this, this, and this.

Because the clock will start, and that will just make everything really difficult down the road.

COMMISSIONER CROWELL: I think I Couldn't have said it any better myself, so thank you.

CHAIR NIEH: Thank you, Commissioner Crowell. Commissioner Marzano?

COMMISSIONER MARZANO: Thank you, Mr. Chairman, and I just want to echo that I kind of share your enthusiasm, I'm jumping out of my seat thinking about different questions, and topics to discuss, and I really appreciate the presentations, but I'm going to do my usual filibustering here.

So, I want to begin by expressing my sincere appreciation to the members of ACRS for your continued dedication and service to the agency, and the country. This moment of expansion in civil nuclear enterprise draws many parallels to the early Atomic Age, and it is really quite remarkable, some of the exact things that are being said around this table right now I think could have been said in the 1940s and 50s.

Almost the engineering judgement point, that is almost line

for line a quote from a former chair I believe in 1957, I'm talking about the uncertainty with some of the designs, we'll get into that a little bit more. But it's just remarkable how these parallels are being drawn. And again, many of the underlying factors that drove the pursuit of new nuclear technologies then in energy security, global competition, economic optimization are present today.

But a key similarity, especially relevant for this discussion is the diversity of the proposed designs under consideration for commercial deployment, and they are characterized by this lack of sufficient operating experience. And while we benefit from decades of technological development that has improved our ability to predict the behavior of these complex systems, the need for the independent technical body to review and advise on reactor safety matters endures in this moment.

Just as it did shortly after the creation of the Atomic Energy Commission decades ago. The Committee's historical perspective, and the technical rigor has shaped the evolution of nuclear safety in the United States. As I mentioned in my remarks earlier this year, the ACRS legacy is not just one of technical excellence, but adaptability.

Continuously evolving to meet the challenges of new technologies, new risks, and societal expectations. Over the years ACRS has made significant contributions to the NRC's regulatory framework, serving as an independent and expert backstop that compliments, as was mentioned before, the work of NRC staff in their technical reviews, and reinforces public confidence in the safety of nuclear technologies.

This is precisely why the ACRS's independent, holistic, and transparent reviews are more critical than ever. However, as the agency anticipates unprecedented volume and diversity of licensing activity, the ACRS must adjust its conduct to continue to serve its role in enhancing the credibility of our decisions without compromising the integrity of the process.

Fortunately during my time with the Senate EPW Committee, I observed the ACRS implement these significant changes to its processes to prepare for this increased workload. This has been going on for a long time, as you've mentioned, and I commend you for these proactive efforts to focus your attention and resources on what is unique, novel, and noteworthy.

That is going to be a buzz word here, I think, coming up around this agency. For your responsiveness to stakeholder feedback regarding the efficiency and value of your reviews. You have demonstrated a commitment to ensuring that your work remains both rigorous and timely, without becoming a bottleneck in the licensing process.

So, thank you very much, and there was a lot of great discussion, and I am fortunate to go last to be able to kind of clean up some of this. But I kind of want to dive a little bit more into the current rule making that we are under consideration for the DOE, DOD reviewed reactors, and how we use that information to make our own independent conclusions.

And so a lot of your members have connections, Dr. Petti, I know you have mentioned it here with folks in the DOE complex, DOD, other members as well. So, I want to talk a little bit more specifically, do you see

a specific role for the ACRS in not just the individual reviews for the reactors that are coming over here.

But kind of setting up a set of principles or criteria to evaluate how we are going to use the data, how robust that data is, and where the gaps may be for staff to be able to identify ahead of time, how they're going to apply, so that we're not repeating what has already been done, but are actually being able to fulfill our requirements for the licensing.

ACRS VICE CHAIR PETTI: That is a good question. I think we could do something like that, impose sort of a number of questions if you will, that touch on largely what we've talked about, tell us about your safety functions, and how do you know. And then tell us about the technology that underpins it, the fuel, and the coolant, other materials, so I think it's something that could be done.

COMMISSIONER MARZANO: Has there been any interest in the ACRS's feedback on some of those projects, in getting involved?

ACRS VICE CHAIR PETTI: Not that I have heard. I mean individually the DOW uses a bunch of subject matter experts, but it's -- at least it was a little different because it had a lot of design side to it, as well as safety. So, there was as much push on making sure the design was coherent, and would work, as well as the safety.

COMMISSIONER MARZANO: So, the ACRS, aside from the reactor safety reviews, and providing us the independent look, there was some other functions that the ACRS has performed historically that I think

we're moving away from. In particular it's looking at, and I think, Dr. Petti, you kind of laid out some of this with application of the reg guide, and PDCs, almost trying to fit the square peg in the round hole, maybe the square is a little bit smaller than that hole, and so now you have some gaps around the edges.

So, how does the ACRS moving forward, one of the things that I'm interested in, especially when we have a lot of turn over in the work force, how do we identify the gaps that we may have technically? How do we continue to be vigilant for where we need to pursue additional either research, or expertise on the staff side?

And I think looking at forums like this one, these are opportunities to have these kind of discussions, and to kind of tease out where we see maybe, where some of those gaps may exist.

ACRS CHAIR HALNON: First of all, since we don't duplicate the staff review, we're not going to find maybe some of the smaller, if you will, compliance issues, and gaps that you say. But we do, one of our tools is the probing questions, and I mentioned that we look for confidence in the staff and the applicant in how they bring things to us, and can they answer the questions coherently?

And do they have the right people in the room, or available, did they anticipate questions such as this? And all these things factor into do we have confidence that we're getting the straight story, and they know what's going on? And that comes back to confidence in the safety case, confidence in the review, and I think that is where we are best served. Is to let you know

that was this done well?

And I think if we can give you a recommendation that alludes to the fact that it's done well, and we will say something to that effect, if the staff did a good job, or the applicant did, we will make those statements so that you have confidence that the vertical process that it went through was integrated enough with the right people, and the right knowledge.

ACRS VICE CHAIR PETTI: The other thing from sort of a knowledge management perspective, the last time we met, so it's been two years, I think Commissioner Wright, you had asked us some questions about what's the right topical reports, and so we put something together that's on the website where we've organized, we think these naturally fit together, we think this other group fits naturally together.

And in a timing sense, these should be early, this one can wait right before you put the PSAR together, but we really need to understand functional containment and source term because they drive everything. And so we put that together to help applicants think about what are the important topical reports to get in front of the Commission, the staff, and us.

And many of them I think follow through, we saw the same types of topical reports coming through with the different applications. When you don't, then you question, you didn't see that?

COMMISSIONER MARZANO: Well, you kind of also touched on it, Greg, there is value in the ACRS review, even if there is maybe not a change in the staff position on a particular item. I believe there is value when there is agreement as well, kind of alignment. Can you talk a little bit

more at a high level how that value kind of translates into the purpose of the ACRS, which is to apply that rigor, and instill public confidence?

ACRS CHAIR HALNON: Thanks. I will go back to an experience I had once with a license renewal when I was on the industry side. And not to indict anybody, but the ACRS subcommittee chairman said you've got to give me something, I've got to write something in the report that makes it look like we did what we need to do.

And that, chairman, we spoke after I got on the ACRS, you said well we really never thought much of the ACRS, that really struck me. And so the point is that the collaboration through the process, and the back and forth discussions, and we're concerned with that, they have an answer, they're concerned with this, we say that's okay for us.

That crossing of wisdom if you will, to me is higher level than maybe one or two recommendations you get that they have to reconcile. We do have a couple of those, the NuScale one was a classic, Dave wrote a source term letter that, which one, that was TerraPower's?

ACRS VICE CHAIR PETTI: No, X-energy's.

ACRS CHAIR HALNON: X-energy's.

ACRS VICE CHAIR PETTI: They missed some big stuff, but I didn't excoriate them in the meeting, I just said now hold it, think about this, and they did admit they hadn't thought about it that way. And so it is all in the letter about staff, you need to understand this.

ACRS CHAIR HALNON: So, a lot of the value doesn't make it to the letter, it's pre, in all this interaction that we have with it, and that

is what we want, because that is that one team effort to come up with the best product at the end.

COMMISSIONER MARZANO: Yeah, and that really kind of highlights the way I'm viewing this now. It's been said already in this room, you're not duplicating in effort, you're offering a complimentary function to the staff, and it is valuable, and it has been valuable for decades and decades of civil nuclear enterprise. So, thank you, Mr. Chairman.

CHAIR NIEH: Okay, well we have reached the end of our meeting. Let me ask, do any of my colleagues on the Commission have any closing remarks to make? Hearing none, well this was a really great meeting, and as I mentioned at the moment, this is the most consequential moment for American nuclear energy in nearly 50 years.

There is a new NRC, there is clearly a new ACRS, and I thank you for your efforts. What remains the same is our focus on safety, and that was abundantly clear through this discussion. And what is changing is how we do our work to fulfill our safety commitment. So, thank you everyone for your attendance, appreciate the presentations, and end of meeting.

(Whereupon, the above-entitled matter went off the record at 11:45 a.m.)