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UNITED STATES NUCLEAR REGULATORY COMMISSION'S ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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NUSCALE DESIGN-CENTERED SUBCOMMITTEE

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TUESDAY

MARCH 19, 2024

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The Subcommittee met via Teleconference, at 10:00 a.m. EDT, Walter L. Kirchner, Chair, presiding.

COMMITTEE MEMBERS:

WALTER L. KIRCHNER, Chair

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VICKI M. BIER, Member

CHARLES H. BROWN, JR., Member

VESNA B. DIMITRIJEVIC, Member

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ROBERT MARTIN, Member

DAVID A. PETTI, Member

THOMAS ROBERTS, Member

MATTHEW W. SUNSERI, Member

ACRS CONSULTANTS:

DENNIS BLEY

STEPHEN SCHULTZ

DESIGNATED FEDERAL OFFICIAL:

MICHAEL SNODDERLY

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P-R-O-C-E-E-D-I-N-G-S

10:01 a.m.

CHAIR KIRCHNER: Okay. Thank you. This meeting will now come to order. This is a meeting of the Advisory Committee on Reactor Safeguards, and it's NuScale Design-Centered Subcommittee. I am Walt Kirchner, lead member for this meeting.

Members in attendance, Mike, can you help me? Can you see which of our members are present?

MR. SNODDERLY: Yes, sir, I can. This morning, we are joined by Member Charlie Brown; Member Dave Petti; our consultant, Dennis Bley; Member Greg Halnon; Member Jose March-Leuba; Member Matt Sunseri; and Member Bob Martin; Member Ron Ballinger; and our consultant, Steven Schultz; and Vesna Dimitrijevic.

CHAIR KIRCHNER: Okay. Thank you very much.

MEMBER BIER: Mike, I'm also on board. Vicki Bier.

CHAIR KIRCHNER: Yes, Vicki Bier. Excellent. Thank you.

MEMBER ROBERTS: Yes. This is Tom Roberts. I'm on, too.

CHAIR KIRCHNER: Okay. Thank you, Tom. Mike Snodderly is the Designated Federal Officer for

ths meeting. The subcommittee will review the staff's evaluation of NuScale Standard Design Approval Application, Chapters 2, 10, 11, 13, 17, except 17.4, and 18. It is our understanding that the staff is conducting a delta review between revision 5 of the certified US600 design and revision 1 of the Standard Design Approval US460 design.

The ACRS was established by statute and is governed by the Federal Advisory Committee Act, FACA. The NRC implements FACA in accordance with its regulations found in Title 10 of the Code of Federal Regulations, Part 7. The committee can only speak through its published letter reports. We hold meetings to gather information and perform preparatory work that will support our deliberations at a full committee meeting.

The rules for participation in all ACRS meetings were announced in the Federal Register on June 13th, 2019. The ACRS section of the U.S. NRC public website provides our charter, bylaws, agendas, letter reports, and full transcripts of all full and subcommittee meetings, including slides presented there. The agenda for this meeting was posted there, as well.

A portion of this meeting will be closed

to protect NuScale proprietary and export control information pursuant to 5 USC 552(b)(c)(4). As stated in the Federal Register Notice and in the public meeting notice posted to the website, members of the public who desire to provide written or oral input to this subcommittee may do so and should contact the Designated Federal Officer five days prior to the meeting.

The communications channel has been opened to allow members of the public to monitor the open portions of this meeting. The ACRS is now inviting members of the public to use the MS Teams link to view slides and other discussion materials during these open sessions. The MS Teams link information was placed in the agenda on the ACRS public website.

We have received one set of written comments from Harold Scott. Those comments have been distributed to the members, and they have been provided to the staff and NuScale for awareness. The comments will be read into the record during the public comment portion of this meeting and attached to the transcript.

We have not received any requests to make oral statements from members of the public regarding today's sessions. Written comments may be forwarded

to Mike Snodderly, today's Designated Federal Official. There will be an opportunity for public comment, and we have set aside ten minutes in the agenda for comments from the members of the public listening to the meeting.

A transcript of the open portions of the meeting is being kept, and it is requested that speakers identify themselves and speak with sufficient clarity and volume so that they can be readily heard. Additionally, participants should mute themselves when not speaking.

And now we'll proceed with the meeting, and I will call on Mahmoud Jardaneh, a branch chief from NRR, to make some opening statement. Go ahead, Mahmoud. Mike, I think you're muted.

MR. JARDANEH: Thank you. Can you hear us now?

CHAIR KIRCHNER: Yes. Please proceed.

MR. JARDANEH: Very good. Good morning, Chair Kirchner, and good morning, ACRS Subcommittee members, NuScale participants, NRC staff, and members of the public. I am Mahmoud Jardaneh. You can call me MJ; it's much easier. And I serve as the branch chief of the New Reactor Licensing Branch responsible for the licensing of the NuScale US460 design in the

Division of New and Renewed Licenses in NRR. Thank you for the opportunity today for the staff to present on their review of select NuScale US460 Standard Design Approval Application, SDAA, chapters. The staff is reviewing all chapters of the SDAA concurrently with staggered completion dates based on the complexity of the chapter and the extent of change from the certified NuScale US600 design.

Today, the staff will be presenting on their review of the first group of SDAA chapters, including Chapters 2, 10, 11, 13, and 17. Chapter 18, which was planned to be discussed during this meeting, will be presented at a later date. The remaining SDAA chapters are still being reviewed by the staff, and we will inform the ACRS when the safety evaluations of the remaining chapters are available for their review.

In today's meeting, the staff will focus their presentations on the differences from the last time we presented on the same chapters to support the now-certified NuScale US600 design. Getachew Tesfaye, the lead NRC project manager for the NuScale SDAA review, will give us a background about the application and walk us through the logistics of the review.

Before I pass the mike to Getachew, I

would like to invite the NRR Deputy Office Director, Rob Taylor, to make a few remarks regarding the change in the agenda for today's meeting.

MR. TAYLOR: Thanks, MJ. Thanks to the committee for the opportunity to come here and just provide brief opening remarks.

As MJ indicated, we're making great progress on the NuScale review and conducting a risk-informed review as we look at the chapters and look at the deltas from the design certification that the NRC approved and that the committee reviewed in the past. As MJ indicated, we've complected a number of the low-complexity chapters, which we're presenting on today. But one of the chapters we had planned to present on but won't be able to today is Chapter 18. Unfortunately, we ran into a late challenge that prevented us from finishing all the concurrences on that chapter. We have finished the safety review but are in the process of finalizing the safety evaluation write-up. In preparing that documentation, we want to ensure the clarity in documenting the basis for our safety decision. We've determined we need a little bit more time to ensure we achieve the desired level of clarity.

We are confident we'll complete the

documentation in the near future and be able to provide a clean safety evaluation in support of the next ACRS meeting on NuScale, so we look forward to presenting Chapter 18 to the committee at the next meeting that we have, once we finalize the documentation. We did not want to give the committee a safety evaluation that might have additional changes in it, just documenting the rationale and the basis and preventing you from doing a comprehensive review of the staff's work. So we're going to take a little more time to ensure the clarity and ensure we get a quality document to the committee and for the public.

So thank you for understanding this late change, and thank you for adopting and working with us as we take a different approach to how we're doing this review than we have on some of the others in the past. So we're learning lessons, and we're going to apply those as we go forward. So thanks to the committee, and I look forward to the good discussion today.

CHAIR KIRCHNER: Thank you, Rob. And now are we going to turn to Getachew, Mike?

MR. SNODDERLY: Yes, please.

CHAIR KIRCHNER: Go ahead, Getachew.

MR. TESFAYE: Good morning.

CHAIR KIRCHNER: Good morning.

MR. TESFAYE: Good morning, Chair Kirchner, ACRS, NuScale, subcommittee members, and everyone that's participating in today's meeting. My name is Getachew Tesfaye. As my bran chief, MJ, indicated, I am the lead project manager for NuScale Standard Design Approval Application review.

In the way of background for today's meeting, NuScale completed a submittal of the Standard Design Approval Application for US460, a small modular reactor, that began in November 2022 and completed in December 2022. NuScale submitted the SDAA application pursuant to the requirements of Title 10 of the Code of Federal Regulations, Part 52, Subpart E. The application was formally accepted for the NRC review on July 31st, 2023 following NuScale's submittal of supplemental information needed for docketing of the application.

As MJ indicated, the NRC staff has now completed its safety evaluation with no open items for 5 of the 19 chapters. About a month ago, we shared with the committee the final drafts of the safety evaluation that was still under management review. The safety evaluations for the five chapters we are presenting today are all final and are publicly

available.

With two exceptions, the technical contents of the final versions have not changed. The two exceptions are, in Chapter 10, the plant heat balance which provides the basis for the design that was missing from the application and has now been addressed with NuScale submittal of a revision to that portion of the application. The Chapter 10 SE was revised accordingly in the final version.

In Chapter 2, Section 2.13, Population Distribution, was inadvertently left out of the draft we shared with you. We have corrected that in the final version. This section of Chapter 2 is entirely site specific and has not changed from SDAA version. The staff will be addressing this in this presentation.

So with agreement with NuScale, the order of presentation is we will start off with Chapter 10, 11, and 13. These are what we consider to be a little bit more complex than the other three chapters. So the order of presentation will be Chapter 10, 11, 13, 2, and 17.

With that, I'll turn over the mike to NuScale and --

CHAIR KIRCHNER: Okay. Before we proceed,

Getachew, let me just make an announcement that we welcome visitors from the Polish Regulatory Authority who are observing our proceedings today. And greetings from Santa Fe, New Mexico.

And let's now turn then to NuScale. This would be Tom Griffith, right?

MR. GRIFFITH: That's correct. Thank you so much. I'm Thomas Griffith, the licencing manager at NuScale, and I'm looking forward to today's presentations from both the staff at NuScale and the NRC. Many individuals at NuScale and the NRC have put in countless hours to reach today's milestone. It has been a little over a year since NuScale's US460 standards plant design was submitted, and today we are at the point of presenting the first chapters to the ACRS. This is an accomplishment for both the NuScale staff and the NRC, and I am humbled to be part of such a historic review.

With that, I'd like to turn it over to Tyler Beck to present the first chapter, Chapter 10.

MR. BECK: Hello. Wendy, if you could go ahead and skip to the Chapter 10 title slide.

Hello. My name is Tyler Beck, and I'm a licensing engineer within NuScale's Regulatory Affairs Department. I'm the lead licensing engineer for

several chapters, including Chapters 2 and 10 which will be presented on today. Prior to joining NuScale, I worked for the NRC and, most recently before joining NuScale, I was a reactor systems engineer in the Generic Communications and Operating Experience Branch. I hold a Bachelor's of Science in Nuclear Engineering from the University of Tennessee. And with that, we will be discussing first Chapter 10, which is the steam and power conversion system.

Next slide. So Chapter 10 includes Section 10.1 to 10.4, which we'll discuss here in a moment. 10.1 is summary description. 10.2 is the turbine generator. 10.3 is the main steam system. And 10.4, which is other features of the steam and power conversion system.

Next slide. So, again, we will start by giving a high level of each section and really highlight the changes from the DCA. Then we'll discuss the RAI 10.1-1 in audit items. Then I'll hand it over to one of our subject matter experts, Mara Swanson, for a discussion of our air cooled condenser system, as well as radiation protection and design basis event mitigation features.

Next slide. So note that, for these slides, I've bolded the things that are changes from

the DCA. And, again, I'm just giving a high level of the systems in these sections and noting these changes along the way. For the turbine generator system, TGS, this includes the turbine, turbine gland seal steam, reboil, the generators, and the generator air coolers.

For the functions in these sub-bullets, there is really only one change with respect to the DCA, and this is the extraction steam. So in the DCA, the extraction steam was a part of the main steam system. But here in the SDA, that is now, that function is now a part of the turbine generator system. However, the functionality is still principally the same from the DCA. It's just a change from being part of the main steam system to the turbine generator system.

In terms of safety significance, the system is Seismic Category III, and it is generally quality group delta with the limited exceptions described in SR Table 10.2-2. There are no safety-related or risk-significant SSC, and there really is no major design change from the DCA.

Next slide. Section 10.3 is the main steam system, and this includes the piping downstream of the main steam isolation valves and up to the turbine generator. This includes the non-safety-

related secondary main steam isolation valves, as well as their associated bypass valves. And this also includes the main steam safety valves.

Similar to the turbine generator system, the system is generally quality group delta and Seismic Category III with limited exceptions described in Table 10.3-4. The most notable exceptions include the secondary MSIVs and their bypass valves, and those are Seismic Category I. These secondary MSIVs are also included in technical specifications. The main steam system does not include any safety-related or risk-significant SSC.

And in terms of design changes, there are really two design changes from the DCA. First, main steam of an operating module is now the preferred source of start-up steam for a module that is starting up. And the DCA, the aux boiler system provided that steam, so, again, in the SDA, the aux boiler system only provides that steam when there is no operating module available to provide steam.

And then the second change is the one we discussed on the last slide. Extraction steam is now part of the turbine generator system, not the main steam system.

Next slide. Section 10.4, other features

of the steam and power conversion system. So the first bullet is bolded to show the design change to the air cooled condenser system. The SDA includes an air cooled condenser rather than the traditional water cooled condenser, and this eliminates the need for a circulating water system. But the functionality is the same or practically the same. The air cooled condenser system condenses steam. It provides capacity for the condensate and feedwater system. It includes a capability for low rejection, and it is not credited in Chapter 15.

For the condensate and feedwater system, there is no significant change from the DCA; or, the turbine gland seal system, there is no significant change from the DCA.

For the aux boiler system, there is a design change from the DCA. So in the DCA, there was both a high-pressure subsystem and a low-pressure subsystem. And so the low-pressure subsystem provided start-up steam for the secondary side, including grand seal steam for the deaerator. The high-pressure subsystem was used to supply a heat to the module heat-up system. But in the SDA, there is no high-pressure subsystem and that's because the module heat-up system now has an electric heater. And so the SDA

version of the aux boiler system is similar to the low-pressure version of the DCA aux boiler system, except it's only providing steam when there is no operating module available to apply the steam.

In terms of safety significance, the SSC within 10.4 are generally quality group delta and Seismic Category III. The limited exceptions are described in Table 10.4-4. And the most notable exceptions are the feedwater reg valves and the feedwater check valves, which are Seismic Category I components. And, finally, there are no safety-related or risk-significant components in the scope of Section 10.4.

Next slide. For RAI 10.1-1, that was the heat balance request. Ultimately, NuScale, we have revised the RAI response and have provided the nominal heat balance case in SR Section 10.1. And then I also wanted to highlight that, during the audit, there was 21 audit items that were successfully resolved. The only unresolved audit item was the heat balance request that made its way to the RAI space.

And with that, I will go to the next slide and hand it over to Mara Swanson for discussion of our air cooled condenser system, as well as any questions you have for her. Mara, it looks like you're muted.

CHAIR KIRCHNER: Mike, it appears that NuScale is muted.

MR. BECK: I think we're trying to get that figured out.

MR. SNODDERLY: NuScale we cannot hear you, the conference room or the speaker. And they're showing that they're muted. Is the NuScale conference room muted, or is the selected speaker muted? But you're showing as muted. Now that person logged off, which is what I think they should do to maybe sign out of Teams and sign back in.

MR. SWANSON: Hello. Can you hear me?

MR. SNODDERLY: Yes, now we can hear you.

MR. SWANSON: Okay. Apologies for the delay.

MR. SNODDERLY: No worries. Could you please introduce yourself for the record? Thanks.

MR. SWANSON: Yes. As Tyler mentioned, my name is Mara Swanson. I'm an engineer here at NuScale Power. I've been with NuScale for the past six and a half years and have a degree in chemical and nuclear engineering from UC Berkeley, and I am the subject matter expert for some of the Chapter 10 systems and one of the people that is available to speak on this system.

So to start off with, we wanted to give a quick summary of the air cooled condenser system since it is one of the changes from the DCA design. So our air cooled condensers were selected to allow for the licensee to place the US460 standard plant design in locations where water access is limited. And as mentioned by Tyler, because the condensers are air cooled, it eliminates the need for a circulating water system. The SDA design does not contain one.

The principal functions of the air cooled condenser system are exactly the same as with a traditional condenser: condense steam from turbine exhaust, reduce the dissolve oxygen content, maintain vacuum, and remove air and non-condensables through the condenser air removal subsystem, and provide adequate capacity for condensate and feedwater system during normal operations.

DR. BLEY: Excuse me. This is Dennis Bley. Going to the air cooled condensers, does this lead to a tech spec on ambient air temperature, or what are the limits on that side?

MS. SWANSON: We have limits similar to those in the DCA for ambient air conditions.

DR. BLEY: Okay. There wasn't for cooling the plant. It was -- well, I guess it was in a way,

yes. No, it was for the pool. So, anyway, I was curious about that. I'll look a little more later.

MEMBER BALLINGER: This is Ron Ballinger. I think what Dennis is saying, for a normal water cool condenser, there are tech specs on the water temperature. Of course, it's connected to air eventually. But now there's just air, and so is there a different tech spec on the air temperature than would have been for a water-cooled system?

MR. BECK: There is not a tech spec related to the air cooled condenser.

MEMBER SUNSERI: This is Matt. This is Matt. Ron and Dennis, I think those tech specs are associated with the water cooled ultimate heat sinks, not the condensing cooling system for the main turbine. This is non-safety-related stuff.

MEMBER ROBERTS: This is Tom Roberts. To follow up on Dennis's question, the heat balance that you all submitted, I didn't see any assumptions on air temperatures in that heat balance, and it did show a condenser storage tank temperature of 100 degrees, which would imply that you're assuming an air temperature less than 100 degrees at the outlet of those fans. So, again, I was wondering what your assumptions were on air temperature and how you

accounted for hot days and the heat balance condition.

MS. SWANSON: The heat balance provided in Chapter 10 uses 59-degree ambient air conditions.

MEMBER ROBERTS: Right. So have you looked at summer, a 95 - 100-degree day and what that does to the assumed conditions?

MS. SWANSON: Yes, we have other heat balance conditions at a range of temperatures.

MEMBER ROBERTS: I guess my question would be is there a concern with the differing conditions? Maybe this is a question for staff, but staff was interested in ensuring that the heat balance outputs were consistent with the inputs to the Chapter 15 accident analyses, and I guess that would be a question of whether the diversions from those conditions would be significant enough to be important to those initial conditions.

MR. GRIFFITH: This is Thomas Griffith, the licensing manager at NuScale. To step in here, I think the overlap here is that the air cooled condensers for the NuScale plants, the non-safety-related function. And then for accident conditions, the UHS is actually what the module is submerged in, so it's a separate heat sink, if you will. And that the air cooled condensers, effectively, with the

outside ambient air temperature, the outside ambient air temperature is going to affect the efficiency of the module but not the ability of the module to perform its safety function.

MEMBER ROBERTS: Got it.

MS. SWANSON: Okay. Moving on to the next slide. So similar to the functionality in the DCA system, this system is covered under Chapter 10, provide effluent and process radiation monitoring that is functionally similar. Radiation monitors allow automatic system isolations and detection of primary and secondary leakage, just as before. Non-safety-related equipment is credited for event mitigation by functioning as backup protection. Once again, this is unchanged from the DCA. And for module protection system interfaces, module protection actuation signals, and post-accident monitoring variables for steam and power conversion systems are unchanged from the DCA.

Okay. We can move to the next slide. Thank you.

MR. BECK: All right. And that is the end of the Chapter 10 content. So unless there are any questions, I am going to hand it over for our Chapter 11 folks.

MS. LOCKWOOD: Hi. Testing. I'm just making sure that everybody can hear me. Okay.

Good morning. My name is Chelsea Lockwood, and I'm currently a licensing engineer for SDA Chapter 11. I've been with NuScale for about four total years. I began working here in 2015 through DCA submittal, and then I returned to the company in late 2021.

Next slide, please. This is an overview of the sections in Chapter 11. To begin, I'll hand the presentation over to Seth Robison to give an overview of Section 11.1, Source Terms. Thank you.

MR. ROBISON: All right. Can you guys hear me?

MR. SNODDERLY: Yes, we can.

MR. ROBISON: Awesome. I'm Seth Robison from NuScale. I work in the radiological engineering department. I'm the subject matter expert for a majority of the radiological content in Chapter 11.

I'm presenting on Chapter 11.1, the source terms. There were essentially no methodology changes from the DCA. The values in the majority of the tables changed due to changes in cycle length, thermal power, and burn-up. Our cycle length decreased from two years to 18 months, our thermal power increased

from 160 to 250 megawatts, and our evaluated maximum burn-up increased from 60 gigawatt days to 62 gigawatt days.

We received three audit questions on 11.1. They're all resolved. First, the NRC staff reviewed the calculation files associated with the offsite doses and found our doses and methodology to be acceptable. The staff also audited the differences in the main steam flow rate between Chapter 10 and 11. In the DCA, the value used in the Chapter 11 supporting analysis was the same as the design parameter in Chapter 10. For SDA, we used a bounding low-steam flow rate for Chapter 11, rather than directly referencing the design parameter.

And the staff also asked why the source terms were not scalable to thermal power. We explained that there were changes in cycle length and burn-up, as well, at least evaluated burn-up.

So that's all we have for Chapter 11.1. I'll pause for any questions. If there's no questions, I'll hand it back over to Chelsea Lockwood for 11.2 through 11.4.

MS. LOCKWOOD: Thank you, Seth. Section 11.2 is the liquid waste management system. Much of this system concept remains unchanged, but there are

a few deltas between SDA and DCA. SDA does not include the COL item from DCA that specifies an applicant must ensure mobile equipment used and connected to the liquid rad waste system meets the ANSI standards and applicable regulatory requirements. The design of our liquid rad waste system itself allows for 30 days holdup capability. The DCA states that the alternate methods of processing liquid waste be described if the holdup capacity is less than two days. So the COL item was inconsistent with the regulatory guidance.

There were also some component changes to the liquid rad waste system, though the concept remains unchanged in that filters, ion exchangers, and reverse osmosis are still used to process the liquid rad waste.

There was one audit question from the NRC regarding the removal of the COL item, and the result of the question was that the COL item was removed from the SDA.

Next slide. Section 11.3 is the gaseous waste management system. As Seth mentioned in 11.1, there are some input changes due to power uprate and the difference in the number of modules from DCA to SDA. However, there are no system changes from the

DCA in this section, and there were also no audit questions on this section.

Next section, 11.4, is the solid waste management system. There were some minor system design changes. The hard piped connections between the rad waste building HVAC system and the liquid rad waste and solid rad waste changed to hooded connections. There are five total audit questions from the NRC, all of which were resolved. These audit questions resulted in adding some clarification into various sections, but there were no resulting technical changes from these questions.

I'll now pause for questions. And if there are no questions, I will pass the presentation to Freeda Ahmed to talk radiation monitoring. Thank you. Freeda, on to you.

MS. AHMED: Okay. Good morning, everyone. My name is Freeda Ahmed. I'm the licensing engineer for Section 11.5. I've been with NuScale for about almost two years. Tomorrow is my anniversary. And I have a decade in experience in radiation monitoring within the nuclear industry. I have my degree in nuclear engineering and radiologic science.

To begin with, the changes from the DCA as far as radiation monitors are concerned, the first is

that we have a smaller plant design, so smaller plant, less monitors. Some other changes are, as Mara and Tyler mentioned, in the aux boiler system, the heat exchangers -- we have radiation monitors on the heat exchangers to detect leakage, but we changed the heat exchangers to electrical heaters, so the radiation monitors on those systems were removed. And after that, the other change was that the circulating water system was eliminated, and so the monitors that were associated with the circulating water system are of the air cooled condenser system, so they had essentially been reclassified but also a change.

The NRC did have some questions, but they were all resolved without any issue.

Next slide. As far as 11.6, all the design features in 11.6 were covered in 11.5.

And I will now pause for any questions regarding radiation monitors. Okay. Thank you. I'll hand it back over to Chelsea.

MS. LOCKWOOD: Thank you, Freeda. I'll hand it back to Tyler for Chapter 2.

MR. BECK: I thought we were going to 13.

MS. BREWER: Hi. My name is Beth Brewer, and I am the licensing lead for SDA Chapter 13. And prior to this, I was the lead for Chapter 13 on the

CFPP COLA project. I have been with NuScale for two and a half years. Prior to that, I worked at North Anna Power Station in both mechanical design and engineering programs. I have 12 years of experience in nuclear. Today, I am presenting SDA Chapter 13, Conduct of Operations.

Next slide, please. Okay. This presentation covers 13.1, organizational structure; 13.2, training; 13.3, emergency planning; 13.4, operational programs; 13.5, plant procedures; and 13.7, fitness for duty. I want to note that 13.6 is not included because it is security.

Next slide, please. Section 13.1, organizational structure, has minor editorial changes from the DCA. There are no technical changes, and there were no requests for additional information or audit questions associated with this section.

Next slide, please. Section 13.2, training, has only minor editorial changes from the DCA. There are no technical changes and no requests for additional information or audit questions associated with this section.

Next slide, please. Section 13.2, emergency planning, has minor editorial changes from the DCA. Additionally, the Technical Support Center

changed elevation in the control building and went from Seismic Category I to Seismic Category II. And it is still fully compliant.

The SDA was revised to clearly state that the Technical Support Center displays use the same instrumentation and control networks used in the main control room but are configured to provide display only, no controls.

We had three COL items in the DCA, and we dropped to two in the SDAA. The DCA had separate COL items for descriptions of the Operational Support Center and Emergency Operations Facility, and these were combined into one broader COL item that requires the applicant to describe the emergency response facilities, and this provides greater flexibility for a COL applicant.

DCA COL item 13.3-1 required the applicant to describe direct communication system or systems between the Operational Support Center and the control room, and this was eliminated from the SDAA COL item and included directly in the SDAA text.

MEMBER BROWN: This is Charlie Brown. Can I ask a question, please? I'm trying to recall back to the original DCA. You said you removed the Technical Support Center. You stated the new displays

are the same as in the original MCR, main control room, but only display only, no controls. My memory is a little foggy since we did the original design. Is this consistent with the original design in terms of no backup controls for the Technical Support Center?

MS. BREWER: Yes. The SDA was just revised to clearly state that.

MEMBER BROWN: Okay. But it's still consistent with the original designs we looked at years ago?

MS. BREWER: Yes.

MEMBER BROWN: Okay. That was my question. Thank you very much.

MS. BREWER: Okay. Regulations were updated in the SDA. 10 CFR 50.47 and 10 CFR 50, Appendix E, were removed from the DCA COL items, and the SDAA COL items refer to 10 CFR generally, and this is due to rulemaking that was in process during SDA development. That new rule is 10 CFR 50.160. Reference to 10 CFR 52.48 was removed because it is a standard design certification requirement.

There was one request for additional information associated with this section, and that's RAI 10097, Questions 13.3-1, -2, and -3. All of these

questions involved needing additional design descriptions to explain how the Technical Support Center meets NUREG-0696 and Supplement 1 to NUREG-0737. Section 13.3 was revised to add additional information to address this RAI.

Next slide, please. Section 13.4, operational programs, has minor editorial changes from the DCA. Additionally, the Reactor Vessel Material Surveillance Program and Motor Operated Valve Testing Program was removed from the COL item because these programs are not applicable to the US460 design.

Next slide, please. Section 13.5, plant procedures, has minor editorial changes from the DCA. Additionally, Section 13.5.2.1 removed discussion about Generic Technical Guidelines. The information concerning how the Generic Technical Guidelines will be used to develop site-specific emergency operating procedures was clarified and consolidated into SDA COL item 13.5-5 and a process to maintain them was provided in COL item 13.5-3.

I also want to note that the plant-specific technical guidelines developed by a COL holder will be nearly identical to the Generic Technical Guidelines provided to the applicant prior to COLA submittal.

MEMBER HALNON: Hey, Beth, this is Greg Halnon. How are you going to assure that? I didn't see anything about Generic Technical Guidelines in the SDA or the COL descriptions in the SDA. How are you going to ensure that, in order to get an nth of a kind type, you know, forecast going out in the future, that the EOPs are going to be similar to each other? Did my question not come through? I'm sorry.

MS. BREWER: It did. Please give me a moment.

MEMBER HALNON: Okay. I'll just keep babbling then. You know, after TMI, the light water fleet did a lot of work in making sure symptom-based procedures were consistent from a vendor piece. There was some site-specific, obviously, because we didn't have like reactors and like sites throughout the country. But I assume that we hope that these NuScale and other advanced reactors will get to an nth of a kind at some point, which means that there's going to be a lot of similarities, if not almost identical reactors and reactor responses. So I just didn't see how the GTGs were going to get translated from site to site in the future to make sure that that the principles are carried forward.

MS. BREWER: Greg, can I provide this

answer to you after this presentation?

MEMBER HALNON: Okay. It can be looked up and we can talk about it more in the future, but I'd be interested to hear how the principle of an nth of a kind and how the, since we lay it on the COL applicants, we could have a variety of COL applicants with all different approaches to their EOPs, how we're going to make sure that there's some level of consistency, understanding they're not be going to be identical. So we can talk about it in the future.

MS. BREWER: Okay. Thanks. The COL items were also renumbered in the SDAA, as compared to the DCA. There were no requests for additional information or audit questions associated with this section.

Next slide, please. Section 13.7, fitness for duty, removed two COL items related to the operational and construction fitness for duty programs between the DCA and the SDAA. These were removed because an applicant referencing the standard design is responsible for providing an FFD program description and implementation, as described in 10 CFR Part 26. There were no requests for additional information or audit questions associated with this section.

And that wraps up the 13 presentation, if there are any questions.

MR. SNODDERLY: So now the NRR staff is going to go, so, please, Getachew, agree to share the screen.

MEMBER HALNON: This is Greg. Were we going to hear about Chapter 2, or is that off the table?

MR. TESFAYE: No. This is Getachew again. Getachew Tesfaye, lead projects manager, NRC. We're going to do the first three chapters of NuScale and then the staff will present their finding on those three chapters, and then we'll pick up with Chapter 2 and 17.

MR. SNODDERLY: So we're thinking, Greg, after lunch. So, hopefully, this morning, we'll see if we can get through 10, 11, and 13 and have lunch, and then do 2 and 17.

MEMBER HALNON: Okay. Thanks, Mike. Yes, I just missed that on the opening. I appreciate it.

MR. SNODDERLY: So while we have this pause, though, in making the switch, I want to be clear. So Member Halnon has put on the record a question of why NuScale no longer refers to the Generic Technical Guidelines as they did in the DC and

what are they going to use now or why that was done, and we don't have an answer for that. So if that can't be addressed by the end of today, then I think we need to have some further discussion at the April full committee because I don't, you know, I don't see how Member Halnon can make a recommendation without that understanding for what is going to replace the Generic Technical Guidelines. So I just want to make sure we're all on the same page here.

MEMBER HALNON: Right. And that's what I was saying. It's an open item, from at least my perspective, that can be covered during the discussion at the committee and then, depending on that discussion, will be whether or not I keep an open item in our report or not.

MR. SNODDERLY: So is that clear to NuScale and the staff? Let's see what the staff says, but, you know, right now, that's an open item, and I don't know if -- you know, the vision here was that these would be SERs without open items or, you know, not a clean review, and at some point we have to go back and revisit this issue. Okay.

MR. TESFAYE: Okay. Thank you, Mike. This is Getachew again. Hopefully, what you consider to be open item can be addressed by the staff.

The chapter projects managers: Tommy Hayden for Chapter 10, Alina Schiller for Chapter 11, and Ricky Vivanco for Chapter 13 will be taking the lead around the staff's presentation. Tommy, take it from here.

MR. HAYDEN: Thanks, GT. This is Tommy Hayden. I'm a project manager for the New Reactor Licensing Branch in the Division of New and Renewed Licenses in NRR. And I'm the chapter PM for Chapter 10, Steam and Power Conversion Systems.

NuScale submitted Chapter 10, Revision 0, of the SDAA FSAR on December 15th, 2022 and Revision 1 on October 21st, 2023. NRC regulatory audit of Chapter 10 was performed over five months from March 2023 to August 2023 and generated 23 audit issues. NuScale submitted ten pieces of supplemental information to address questions raised during the audit; and, as mentioned by NuScale, there was one request for additional information in Chapter 10 that was issued and resolved. Staff completed the Chapter 10 review and issued an advanced safety evaluation to support today's ACRS Subcommittee meeting.

The contributors for the Chapter 10 review, technical reviewers: the lead, Angelo Stubb; Greg Makar; and John Honcharik. And as mentioned,

myself, I was the chapter PM and Getachew Tesfaye the lead PM.

At this time, I'll turn it over to Angelo to go over the significant changes from the DCA, the review considerations, and findings and conclusion. Angelo.

MR. STUBBS: Thank you, Tom. My name is Angelo Stubbs. I'm a safety and plant systems engineer. And as Tom said, I was one of the lead reviewers on Chapter 10.

I want to pick up with what significant changes was as we perceived them as we went through the application. So this slide, the highlights of what significant differences between the SDA and the DCA. I'm starting out with the first thing was there was an increase in power, and I think it's significant, when you have a chapter on power conversion, that you recognize that there's an increase in power, and that increase in a power means that you have different SSCs than you had in the DCA in terms of the design capabilities and the sizes and things like that.

So the first thing you would look at would be you're looking at a change from 50 megawatts electric to 77 megawatts electric, which means you're

going to have to use a turbine that's larger. And that's important only in the sense that, you know, one of the things you look at when we do our reviews is we look at turbine missiles. And a larger turbine changes the missiles from what was evaluated in the DCA. So that was the first thing.

Also, as mentioned earlier, your conditions in the secondary side change because you have to support higher power, and that starts with the heat balance. And the heat balance gives you the secondary side conditions in terms of pressure flow, enthalpy, and your design and your sizing of equipment and everything is based on what you expect to have on the secondary side. Usually, there's 100-percent guaranteed heat values that really form the basis of secondary side design.

So in the uprate, we ended up with higher flows in the secondary side, and that means we needed to reexamine what was there in terms of being able to relieve the pressure with main steam safeties, and they're larger than they were in the DCA. Also, as mentioned before, these conditions are used in developing safety analysis and also plant transient analysis, AOOs. Even if they are not used directly, they let you establish what's conservative when you

actually do those analyses. And in some cases where you need to model the secondary side, it provides you with the parameters you use when modeling the secondary side if you're using a code that has secondary side inputs. And we know that there's a commonality between the interface at the steam generator, so, even though the secondary side is not safety related, a change in secondary side through the steam generator can be felt on the primary side.

The second change, really it was a major change, was that the main condenser was changed from the water condition at DCA through an air cooled condenser in the SDA. And this is really the first time we're looking at using an air cooled condenser at a nuclear power plant for the main condenser and for removing the normal heat associated with, with normal AC associated with a nuclear power plant.

By using an air cooled condenser, as they mentioned earlier, this allows you to eliminate the need for a circulating water system because now, in effect, the atmosphere becomes your heat sink and, basically, the condenser directly ejects its heat into the atmosphere and that becomes the heat sink. So there's no circulating water system needed. So that's a major thing.

One of the things, I guess the question was being asked about the air cooled condenser. From a review standpoint, this is non-safety related. There's a lot of interesting questions from a performance standpoint that you could ask, and I think, to some extent, it's going to be site specific because, I think, where you locate it in terms of the conditions at that site and really there's other questions associated with the particular interference between the various ones, but none of those are really safety concerns, but they would be concerns, I think, for operations and for performance.

The auxiliary boiler was another change. An auxiliary boiler, the major modification there was it no longer relies on the auxiliary boiler for module heat-up. And by not having a module heat-up for the auxiliary boiler, the high-pressure boiler was removed; and now they only have low pressure, and that supports everything.

I see there's a hand up. Was there a question?

MEMBER ROBERTS: Yes. Angelo, this is Tom Roberts. I want to follow up with you on the question I had on the air temperature sensitivity. In your RAI, you made the point that it was important to

understand the conditions in the secondary systems as the inputs to the Chapter 15 analyses. And as NuScale pointed out, they assumed 59 degrees for the air temperature, and the conditions on the secondary side could be considerably different on a hot day. I was wondering if you had any comment on that, whether that's something you needed to fully validate the assumptions into the safety analyses or whether that was basically in the noise. Basically, how did you resolve, you know, the question of air temperature variability on secondary plant conditions?

MR. STUBBS: Well, I think, you know, from day to day and from day to night, you're going to have variations. But, generally, we look at what the conditions are when the plant is running at 100-percent power and, really, it gets to, the conditions, basically, the feedwater inlet conditions and things like that. You know, I haven't really looked into it, but this isn't something that -- it's more pronounced here because of the air cooled condenser, but this isn't something that I don't think would be present at other, you know, maybe to a smaller variation to other systems.

MEMBER BROWN: This is Charlie Brown. I'm struggling the same thing that Tom is struggling with.

Where I live, the temperatures in the summer, throughout the summer consistently get up to 85 - 95 degrees, which means you can't run the steam plant at full power. You can't generate electric power. What good is the plant if it can't generate electric power when it's hot outside?

MEMBER HALNON: This is Greg. It's a commercial issue. It's not necessarily a safety issue.

MEMBER BROWN: I'm not arguing with that. It's just that it seems kind of counterintuitive to actually putting a plant in that's actually going to serve the population's purpose.

MR. STUBBS: You're right. I mean, that's one of the things -- the air cooled condenser, performance-wise or efficiency-wise, is probably not going to be as good as the water cooled condenser. And especially, like you say, in summer, when you really have the peak demand, you also may have the conditions that aren't as favorable for getting out of the condenser what you need.

Again, it's not a safety, it's a performance. And without knowing exactly, you know, what they're building into it in terms of excess capability, I can't really speak to that.

MEMBER BALLINGER: This is Ron. This is really no different than a water cooled plant where, at some point, if the water temperature gets too high, they have to de-rate the plant. I mean, it's just substituting air for water, and it's not safety related. These plants get de-rated when the water temperature gets too high as a normal course of events, no?

MEMBER BROWN: So you're willing to --

MEMBER ROBERTS: Ron, I think that's right. My question is a little different. I just maybe want to restate the question. The staff issued an RAI saying they needed to get this heat balance because they needed to get the parameters to ensure that the initial conditions and the assumptions used in the safety analyses in Chapter 15 AOOs and the design basis accidents were all valid from the standpoint of were they in the right range. And recognize there's variability in any plant and recognize that some of those parameters are going to have to change, it seems like, and I think Angelo confirmed, that there will be more variability here than in a water cooled condenser system. I just want to make sure that the staff had thought through, since they needed this information, whether the variability

caused by ambient temperature change was considered and whether or not they needed more information to fully bound the assumptions for the Chapter 15 analysis.

Yes, I recognize performance is a separate issue. That's right now what I'm asking.

MR. STUBBS: Okay. I'll just say one thing. The Chapter 15 analyses don't necessarily use the numbers that heat balance provides. They may use the number plus or minus 20 degrees or something like that because they're developed to provide conservative results, so that's something that's also taken into consideration. It's not the exact number, but if they could use the number and show that that number is conservative compared to the actual expected number on the heat balance, which I think they normally do, you're not really looking at pinpointing a specific number and using it in Chapter 15 but having a number to base it on when you do a Chapter 15 analysis and you put in a conservative number.

MEMBER ROBERTS: Okay. Thank you. So maybe this is a question to ask when we review Chapter 15?

MEMBER HALNON: Yes.

DR. BLEY: Yes. I think, from Tom's point

-- this is Dennis Bley again -- for Tom's point, that's true and makes sense. I know, on the other side, you're saying it's a performance issue, and NRC's concern is safety, which is true; but if the agency licenses a plant that can't produce power, it's fairly embarrassing, I think. So questions in that area seem worth at least a little exploration.

I have a second question in this area. You're in a water cooled system. The first problem you hit is you start to lose vacuum if the external water temperature gets too high. But you do have vacuum during operation, and that's not only condensing the steam but it's also removing non-condensable gasses. I'm not familiar with the air cooled systems. How are non-condensables removed from the system when you don't have a vacuum condition in the condenser?

MR. STUBBS: What do you mean when you say you don't have a vacuum condition? Because this is --

DR. BLEY: In a condenser, you run water through and you're condensing the steam. Well, go ahead. You were going to answer me.

MR. STUBBS: I was just saying that they have systems to ensure that they do pull vacuums into that system, and when you have a loss --

DR. BLEY: Okay. They have a --

(Simultaneous speaking.)

DR. BLEY: -- that pumps out the non-condensables.

MEMBER BALLINGER: I mean, the air ejectors are on the steam side.

MEMBER HALNON: Not in an air cooled condenser. The steam side air ejectors are only steam side because you have -- oh, I see what you're saying, Ron. Yes. Okay.

MEMBER BALLINGER: We just changed the fluid on one side.

MEMBER HALNON: Yes. I get it, I get it.

MEMBER BALLINGER: Fort St. Vrain ran, I think, with air cooled. Did Fort St. Vrain run with air cooled condensers?

DR. BLEY: Was it not for long.

MEMBER PETTI: I don't remember. I don't recall.

MEMBER BALLINGER: Yes.

MEMBER HALNON: So this is Greg. I have one other question on this. Obviously, when you don't have the cooling water on one side, you have, you know, less corrosion, less probability of tube leakage and that sort of stuff, but you also don't get

necessarily, you have a direct line, if you do get a tube leak, you get a direct line to the atmosphere relative to any kind of radioisotopes that -- I'm assuming that, because of the reduction in the probability of any kind of tube leak, that translates into just a safer situation relative to if you have any kind of radioisotopes in the steam system; is that correct?

MR. STUBBS: I can't speak to probabilities.

MEMBER HALNON: Well, I'm not a math head. I mean, I'm looking at, just subjectively, it seems a better system from a potential tube leak perspective because you don't have that water on one side. However, if you do get one, it's actually a direct -- there's no scrubbing of water or anything from a radioisotopic perspective. So I guess another question would be how did you reconcile the difference between water and air relative to having a potential tube leak?

MR. STUBBS: I guess that's not something that I looked into. But, generally, there's a tech spec for the leakage across the steam generator for a tube leak there. I thought that was something that was looked at and there was actually a limit imposed

on that.

MEMBER HALNON: Okay. I'll study it. I didn't look through this in a lot of detail. So if there's not a straightforward answer, I'll go study it. If I have any further questions, I'll make sure you guys get them.

MR. STUBBS: Okay. And that might be something that would appear in Chapter 11 and not necessarily discussed here.

MEMBER HALNON: Yes. Okay. Thank you.

MR. MAKAR: This is Greg Makar from the Corrosion and Steam Generator Branch. I wanted to confirm, yes, that they have an operational leakage limit in the steam generator tech specs. I don't know the answer to your question directly the difference between the air cooled condenser and water cooled condenser during a tube rupture event. That is an accident analysis that I'm not familiar with and up to answer the question, but I think it has been looked at.

MEMBER HALNON: Okay. Thanks. I'll explore it. And, like I said, if I cannot get answers to my own questions by my own reading and study, I'll make sure that I get a question back to you.

MR. STUBBS: Okay. So I'll continue with

the last two items on this slide. The turbine generator. I thought I'd indicate that, in the DCA, there's actually two turbine buildings, one at each side of the reactor building. In this case, there's a single turbine building. The only thing there is the turbine building isn't safety related, it doesn't have safety related things. But if there was to be a turbine missile, it would be a source of the turbine missile. And having one building means you only have one launch point for a turbine missile if that was to happen.

And the last item was elimination of the circulating water system because you have the air cooled condenser. You know, basically, generally, the circulating water system is probably the largest potential source of flooding in the turbine building due to maybe the failure of an expansion joint. And in the case of NuScale, there's no aux building next to it. There's no SSCs important to safety that would be impacted by such flooding, but I just thought, you know, in general, when we do a review, we look to that. And if you look at the guidance, it talks about flooding. Generally, the largest source of that flooding would be the circ water system. And if it's a large flood, you even want to see where the water

runs, if it runs out of the turbine building, make sure it runs away from the plant and it doesn't go towards the reactors.

We can go to the next slide. Okay. This slide just highlights some of the things that we considered when we were looking at the review. NuScale points out that the Chapter 10 subsystems and power conversation systems are non-safety related. But one thing I'd like to at least make you aware of, when they do that, they develop the systems and put boundaries so that systems are non-safety related. In our reviews, we look at the system in terms of performing the function that system is supposed to perform, and things like the main steam isolation valves, which at the containment system, the system will provide guidance when we look at that, when we look at our main steam system or we look at the feedwater regulating valve when we look at the feedwater system because, even though they could perform a containment function, they also perform other functions that, when they're reviewed by containment, aren't looked at. The main steam isolation and the feedwater regulating valves, in terms of station blackout, would need to be closed so that you could establish natural circulation through

decay heat removal system, and that's a requirement for that. It's not a containment isolation requirement there. So we did look at those, and we did consider those and looked at, you know, their safety class, their seismic class, and things like that, in the review.

Also, like I said earlier, the turbine building doesn't contain any SSCs important to safety, but it contains the turbine, which could cause ejection turbine missiles that potentially impact things outside the turbine building. In this case, everything that needs to be protected is in the reactor building, and they use the barrier approach to show they had adequate protection.

Normally, we would be looking at turbine overspeed to look at, you know, the probability of missiles and the capability to prevent overspeed. In this case, because of the approach where they used a probability, I mean a barrier, we didn't really look into the turbine overspeed, and the turbine missiles are evaluated in Chapter 3, and you can see where they looked at the protection of those SSCs against turbine missiles.

And, finally, the air cooled condenser, the one thing there I wanted to bring up was the

condensate collection tank. We review it as not looking to protect the tank but, if the tank fails or leaks, it's sort of like having a condensate storage tank, and that could contribute to the spread of contamination. And in terms of looking at 10 CFR 20.1406, we looked at that. There, we wanted to make sure that, if there was a failure, you can be able to see and detect that and locate the failure because that's the tank that sort of accesses the condenser hotwell. But that's outside the turbine building and it's outside in the yard, and the water then returns back to through to the feedwater system. So, again, that was just something we wanted to consider.

And next slide. So for the increase in power, as they mentioned, they did provide heat balance, so we did look at that and we did do some comparisons in terms of what was being used in other places, and there was no problems with that. Turbine generator, again, important to safety because of the missiles, but the barriers are used to ensure that SSCs for safety aren't affected.

In the air cooled condenser, the major thing there was that, before the condenser was in the turbine building, the hotwell was in the turbine building. So everything that could be released

through that part, the condenser and the steam going to it, was in the turbine building, but now it's outside. So we're no longer looking at things being collected in the turbine building drains or through the HVAC system, and we looked to see that that was there and that there's adequate monitoring on that.

So in conclusion, we found that the Chapter 10 subsystems were in compliance with applicable regulations. And just like other reactors, most of the systems in Chapter 10 is not safety related. But most of the regulations that we're reviewing them against are dealing with radiation releases or the failure of the system being able to affect other systems, and we found, because of the plant layout and because of the monitoring and the design, that the regulations were met for this design.

So that's all I have.

MS. SCHILLER: Good morning. My name is Alina Schiller. I'm a project manager in the NRC Office of Nuclear Reactor Regulations, Division of New and Renewed Licenses, New Reactor Licensing Branch. I would like to thank the ACRS subcommittee; NuScale Power, LLC; and the general public for entertaining the NRC for the presentation of the staff's safety evaluation of Chapter 11, Radioactive Waste

Management, Revision 1, of the SDAA Final Safety Analysis Report.

Next slide, please. NuScale submitted Chapter 11, Revision 0, in December of 2022 and Revision 1 in October last year. From March through August 2023, the NRC performed a regulatory audit as part of its review of Chapter 11. NuScale submitted supplemental information to address questions raised during the audit. There were no formal RAIs, requests for additional information, issued for this chapter. We are here today to discuss the staff's advanced safety evaluation of Chapter 11.

Next slide, please. I'd like to introduce the technical staff: Edward Stutzcage, the lead technical reviewer with the Division of Risk Assessment, Radiation Protection and Consequence Branch; Derek Scully with the Division of Safety Systems; Joseph Ashcraft and Dinesh Taneja with the Division of Engineering and External Hazards. I am the project manager for Chapter 11, supported by the lead project manager, Getachew Tesfaye.

Next slide, please. Now I'm turning over to the NRC subject matter expert, Ed Stutzcage.

MR. STUTZCAGE: All right. Thanks, Alina. Hi, this is Ed Stutzcage with the Radiation Protection

and Consequence Branch. This slide is just a listing of the Chapter 11 sections.

Next slide, please. This is kind of the overview slide of Chapter 11. The methodology used for calculating the Chapter 11 source terms in the SDA is similar in the DCA. It's essentially the same, but the source terms in doses change due to the design changes. There aren't really significant changes to the rad waste system. And then the process in effluent monitors where there's some few small changes, they generally fulfill the same objectives: monitoring potential release points, detecting primary leakage, and detect radiation in systems and areas where you hope it's not or you don't want high radiation. It's kind of the same function as the radiation monitors in DCA.

Next slide, please. Now we'll go through the changes, the more significant changes that I listed here. This first one, 11.1, is probably the largest one where all the source terms and effluent releases, those calculations, everything changed due to the increase in power, the cycle length, the number of units there are, all those types of things, all affected the source term calculations, the releases, those calculations. All that stuff was audited by the

staff. We did our own independent confirmatory calculations for some of the source terms and for the effluent doses. We found them to be acceptable.

Next slide, please. Going on to 11.2, there's a few items here. The first one is, while the design of the rad waste building is really addressed in Chapter 3, in Chapters 11 and 12 we looked at the classification of the rad waste building due to the guidance in Reg Guide 1.143 and the types and quantities of material in the rad waste building. So this is a change from the DCA. In the DCA, the entire rad waste building was RW-IIa in accordance with Reg Guide 1.143. In the SDA, the portions of the building that essentially have the rad waste and the rad waste systems are RW-IIa, and the portions that are not are Seismic Category III. And there's also some changes to where some of the way out of some of these buildings that result and that cause these changes, but, essentially, everywhere where there's radioactive material that's RW-IIa. And where there's not and on the upper level where there's not, it's Seismic Category III.

Next slide, please. Just before you go there, that's in accordance with our guidance, our Reg Guide 1.143, Rev. 2, and we found that to be

acceptable.

Okay. So this slide is it says here NuScale discussed this. There used to be some discussion, a COL item, for potential mobile waste processing equipment. The NuScale design, the SDA has plenty of processing and capacity. The mobile rad waste equipment isn't necessary for design, so they removed the COL item associated with the mobile waste processing equipment. So that's that item.

Next slide, please. Also in 11.2, something that NuScale, during their design review, they originally considered, in the DCA and the early version of the SDA, they essentially kind of double-calculated carbon-14 in both the liquid and gaseous effluence. They changed that to remove the carbon-14 and the liquid effluence, which is consistent with our guidance in Reg Guide 1.21 and NUREG-0017 because we expect most of the carbon-14 to be released through airborne. So that resulted in some recalculations of some discharge flow rates and elution flow rates and that type of thing. So that revised the liquid effluent calculations, and we reviewed that in an audit and found that to be acceptable and did our own confirmatory calculations.

Next slide, please. 11.3, there really

isn't anything of significance that changed for the gaseous rad waste management system.

Next slide, please. 11.4, solid waste management system. Similar to the liquid waste management system, there was discussions of mobile waste processing equipment in the DCA. That's been removed, and it's going to be removed in Rev. 2 of the SDA. NuScale has adequate space for processing and storing solid waste, and so it was unnecessary to include information on mobile processing equipment in the SDA. So the staff found that to be acceptable.

Next slide, please. For 11.5, the process and effluent radiation monitoring, as NuScale said, there's maybe a few less monitors and a few minor changes. But, in general, the monitoring, there's not really anything very significant that I felt needed to be discussed in particular. And that's the same for 11.5 and 11.6, which is essentially just the instrument and controls part of the radiation monitoring design is what's covered in 11.6. So the staff found the radiation process and effluent monitoring to be acceptable.

Next slide, please.

MEMBER HALNON: Before you go on, this is Greg Halnon. Can you describe how you found

acceptable, and I'm not saying it's not, but how you found it acceptable that the condenser or that whole air cooled system now, rather than water cooled, is outside the building? How do you monitor that with -- let me back up.

If you have a high main steam system radiation alarm, I understand that the control room needs to take some action and one of those actions is isolate steam and other things. But, nevertheless, now that it's outside the building, how do you monitor radiation release from the condenser area, what used to be a turbine building or hotwell system?

MR. STUTZCAGE: Yes. I think there's radiation, I mean there's obviously radiation monitoring in the main steam system, and I think there's also radiation monitors on the release path. I don't know that it can --

MEMBER HALNON: It's outside now, right? Which could be, various environmental conditions could affect it, where, in the past, it was within, you know, contained in the turbine building. How did you evaluate that? Did you take a look at the configuration and do any calculations, or do you, you know, it's something new. Someone mentioned --

MR. STUTZCAGE: Right. I don't have an

answer to that. I can look into that for you. I know that the piece on, you know, the consequence of a steam generator tube rupture, that would normally be covered in Chapter 15, not so much in Chapter 11, or primary to secondary leakage, that type of thing, an accident scenario.

As for the monitoring itself, I'll look into that for you and I can see if I can provide additional information.

MEMBER HALNON: Okay. And I'm just looking at the delta, you know, the difference between it being contained in a building in a hotwell versus now it's outside. And I'm not professing to know a lot about the design of the air flow through it, if there's a specific path that it all goes through or if it's just a free flow. So I'm interested in it's maybe more of a design issue than it is a monitoring issue, but I can't, in my mind, reconcile the delta from what I saw in Chapter 11 write-up.

So that's just where I'm looking at, just the deltas. I don't need to understand the specifics of the COL. I get that. That's pretty standard way of monitoring radiation inside of a building. So if you could just look into the differences between being in a building and not. And if you can convince me

that there's no difference because X, Y, and Z is the way it is, then that's fine, too. But I'm trying to get straight in my mind how this configuration would work.

MR. STUTZCAGE: Okay. Thanks. No problem. Okay. I think that pretty much concluded my presentation.

MR. VIVANCO: All right. Good morning, everybody. My name is Ricky Vivanco. I'm a project manager for New Reactor Licensing Branch, and I'll be presenting Chapter 13 of the NuScale SDAA, the conduct of our operations.

As with the other chapters being presented today, Chapter 13, Conduct of Operations, Revision 1, was submitted on October 31st, 2023, and the audit, as part of the review, was conducted between March 2023 and August 2023. One RAI was submitted regarding 13.3. There were five other supplemental pieces of information addressed during the audit. However, these pieces of information are part of the 13.6 review of physical security and are not being discussed today.

Chapter 13 had several areas of review, so several branches were involved. Kamishan Martin was responsible for 13.1, 13.2, and 13.5. Kenneth Mott

was responsible for 13.3. I'm responsible for 13.4. Paul Harris, who has since retired, was responsible for 13.7, and we have Brian Zaleski who has taken over since then. Again, I'm the project manager for this chapter with Getachew Tesfaye being the lead PM.

The sections today, 13.1 is organizational structure; 13.2 is training; 13.3, emergency planning; 13.4, operational programs; 13.5, procedures; 13.6, physical security and not being discussed today; 13.7, fitness for duty.

For 13.1 and 13.2, the staff found no significant changes between the DCA and the SDA, and the staff's finding was consistent for both sections. 13.3 -- go ahead.

MEMBER MARTIN: This is Member Martin. At the risk of exposing some ignorance here, when it comes to, say, the training chapter here or really anything in Chapter 13, to what extent did you consider in your review the impacts to the simulator? Is that really part of the scope, or was there really no change, no impact? I would think, with some design changes of power uprights, they might enter into this scenario, you know. Maybe just in the normal detailed design of the simulator, there might be some changes.

Can you speak to what you considered in

vetting the impacts of the design change on the simulator?

MR. VIVANCO: I'll have to defer to Kamishan or Loren who's online.

MS. MARTIN: Good morning. This is Kamishan. We looked at more things of training, as far as what was required. I don't know if Loren wanted to add anything, but we didn't really look at the simulator in this part of the review.

MEMBER MARTIN: Okay. So that is just not normally part of the review, I mean, that there's, of course, requirements in 10 CFR Part 55 and there's at least one reg guide out there that I believe was at least referenced in Chapter 13.

MEMBER HALNON: Hey, Bob, this is Greg. Typically, you don't see the simulator identified in the FSAR. It's covered in requirements for the systematic approach to training, other issues. So I would expect similar configurations to be outside of the scope of the FSAR. It is a design control issue relative to the training program.

MEMBER MARTIN: Okay. Well, I guess, at the risk of exposing some ignorance, I asked my question. So thank you.

MR. VIVANCO: Thanks for your question.

13.3, the COL item for the OSC and the EOF are removed as part of the SDA FSAR compared to the DCA. The COL item in the SDA is broad to include all emergency response facilities. The NRC staff found that the COL item including the applicant to address the requirements for any and all emergency response facilities provide for a more streamlined application and provides flexibility for future applicants that may not be required to provide specified emergency response facilities.

Now, the DCA FSAR listed a TSC room and additional size specifications that were removed in the SDA, but the NUREG-0696 found that these specifications were not required for SDA and that the guidance only specifies that a minimum of 25 TSC personnel are required. DCA FSAR also listed the TSC as a Seismic Category I structure, while the SDA listed the TSC as a Seismic II Category structure. Again, NUREG-0696 found that the TSC does not require a seismic category criteria to be qualified as an engineering safety feature. And, overall, the SDA found that the conclusions are consistent with that of the DCA.

13.4, operational programs. The staff found that the Motor Operated Valve Testing Program

and the Reactor Vessel Materials Surveillance Program were both removed. The US460 does not contain any safety-related MOVs, and the FSAR Section 5.316 is under review for exemption from the Reactor Vessel Materials Surveillance Program. Still, the staff finds that the COL item 13.4-1 lists all the applicable programs.

13.5. The removal of the GTGs were found to be significant. However, the staff did not make any findings of the GTGs in the DCA, nor did it impact the conclusion of the DCA. Therefore, in the SDA, the SDA conclusions are consistent with those of the DCA.

Now I'll defer to Kamisham or Loren for any additional questions on this topic, as I know there has been some discussion.

MEMBER HALNON: Yes. This is Greg Halnon. The question stands on how are you going to ensure that the GTGs, you know, are translated to future applicants for COLs so that there's a consistency in the approach that was pretty well established after TMI with NUREG-737 and modified by a couple of generic letters after that. I don't know how we can get to an nth of a kind if you have a variety of approaches to accident and transient response.

DR. BLEY: This is Dennis Bley. On this

one, I'm just not quite sure. The removal of the discussion of the GTGs, do the GTGs in the original certification still apply? They were the only thing that really told us how the procedures were going to be organized and written. Or are they just gone for this application?

MR. BOWMAN: So this is Doug Bowman from NuScale. I'm going to try to answer this question. I'm the plant operations services manager and just a little bit of background about myself. I spent 24 years in commercial power before starting at NuScale. Most interestingly, I was involved with the full rewrite of the emergency operating procedures at DC Cook during their restart effort, and I'm part of the team that originally developed the GTG concept for NuScale. I've been at NuScale here for about ten years now.

So the Generic Technical Guidelines, as Greg stated earlier, are required by the TMI Action Plan, so we still maintain a set of Generic Technical Guidelines and those are absolutely auditable by the NRC at any time. So TMI Action Plan IC1 would require the preparation of emergency procedure technical guidelines for development of emergency operating procedures, i.e., there's your hook, your regulatory

requirement for Generic Technical Guideline. And NUREG-0800 SRP 1352 requires design-specific Generic Technical Guidelines be used by the COLA to develop their plant-specific technical guidelines from which the EOPs will be developed.

So I think, if I'm understanding Greg's question correctly, we are required to maintain a set of Generic Technical Guidelines by these regulations. Is that really what your question is, Greg, or is there something I'm missing there?

MEMBER HALNON: Well, I mean, again, we're just looking at the delta. You had them in the COL, and it was imposed as part of the COLA. Now we're taking them out, which I haven't found a good explanation why were they included in the first go-around and/or why is it okay to take them out now. So it's --

MR. BOWMAN: So the only thing we really removed was, during the original design certification application, we received an RAI for the Generic Technical Guidelines, which were not originally included as part of the design certification application. We submitted those on the docket. The NRC reviewed them, and, at the end of that, we had a discussion with the NRC and we removed the Generic

Technical Guidelines from the docket because the existing industry does not docket their Generic Technical Guidelines.

So the only thing we have removed is that technical report that was docketed. There are still COL items that require COLA to develop their emergency operating procedures from a set of Generic Technical Guidelines.

MEMBER HALNON: Okay. So you're confident -- and I'm going to put words in your mouth, and you can say yes or no. You're confident that the use of your Generic Technical Guidelines is required downstream for every applicant that may come through and build one of these plants, so that, when we go to nth of a kind, there may be some minor various site-specific issues or response issues, but, in general, the responses will be nearly identical?

MR. BOWMAN: Yes, that's correct. And there's some other design considerations, too, that I could get into. For example, our emergency operating procedures are fully embedded in our system interface, which was, as part of the DCA, accepted in the control design. So it's going to be difficult, technically, for a future applicant to implement anything other than what we're going to give them.

MEMBER HALNON: Okay. Yes, and I realize --

MR. BOWMAN: But that's obviously not regulation.

MEMBER HALNON: Yes. I realize we're in a new world of procedure usage through the software application. So I'm fine with it, but I think that somewhere that explanation needs to be, you know, the historical piece of it is good, but, as we go forward, we need to understand how that path works because just the optics of having it in one and then removing it in the next just doesn't look good.

MR. VIVANCO: Are there any more comments in regards to 13.5? Hearing none, we're going to move on.

MEMBER PETTI: There is a hand raised.

MR. BOWMAN: That's probably mine. I'll take it down.

MR. VIVANCO: All right. Thank you.

DR. BLEY: This is Dennis Bley again. I'm just sitting here kind of trying to remember and stewing on that last discussion. My memory, and you guys help me out, was when we reviewed this back in the original design cert, the GTGs were in a separate technical or topical report or some other engineering

report. And if I'm right in that memory, that document, I assume, still exists and either will be revised or improved; but, in any case, it's going to continue to be a document, and I don't know if that's referred to or not in the application.

MR. BOWMAN: So, Dennis, we do indeed, we actually periodically update the Generic Technical Guidelines, and we have one revision we've done already to essentially align it with the SDA. So, yes, we are maintaining the Generic Technical Guidelines. And as stated previously, those would be currently open to be audited by the NRC.

DR. BLEY: Okay. I guess, thinking back, I think that original set, some of us looked at those, but some kind of got into loops or problem areas. But you, no doubt, revised them since what we looked at. And we assume we'd look at it in more detail during a COLA.

MR. BOWMAN: Correct.

DR. BLEY: Okay. Thanks.

MR. VIVANCO: Any additional comments for 13.5? Hearing none, 13.7, fitness for duty. The staff found that the DCA included a COL item for the fitness for duty program, and the SDA removed this COL item. Staff found that this is acceptable because 10

CFR Part 26 requires any entity who intends to implement an FFD program to provide a description of the program and its implementation as part of the license permit or limited work authorization application. The staff found that the COL item for this SDA is not required.

Are there any last questions for Chapter 13, Conduct of Operations? All right. Now I'll turn it over to Getachew.

MR. TESFAYE: Thank you, Ricky. That completes the staff's presentation of the first three chapters.

MR. STUTZCAGE: This is Ed Stutzcage. Could I just ask one follow up on that question on the air cooled condenser? Can I add something quickly? I just wanted to say that I was looking here and just verified that the main steam lines have argon-41 monitors and the turbine gland steam outlet has particular iodine and noble gas monitors, as well as argon-41 monitors. And then the air cooled condenser system has argon-41 monitors and the containment air removal system common event evacuation line as particular iodine and noble gas monitors.

So does that answer the concern on monitoring? I understand that the air cooled

condenser system is outside. I don't think we looked at any concern with monitoring outdoors, but I'm wondering if that answers the concern from a monitoring standpoint or if there is any other concerns.

MEMBER HALNON: This is Greg. I guess this was my question. I was looking at Table 11.5-4 which is titled Effluent and Process Monitoring Off Normal Radiation Conditions. And at first glance, I didn't see where the air cooled condenser was included in that. So if you want to take a look at that table for me and point me to where those --

MR. STUTZCAGE: Yes. So I think, and I could be wrong here, but I think this may be one of the things that is going to be in Rev. 2 of the application. I'd have to double-check that to see if that's the case, but there may have been a few things that didn't make it into Rev. 1 that were addressed through audit items. I could check that. I know Table 11.5-1 does mention -- 11.5-1 kind of gives all the process and effluent monitors, and 11.5-4 kind of goes into some details on the system responses. And that table may not be fully updated, but I'd have to verify that.

MEMBER HALNON: Okay. It's just an open

question in my mind as to how that off-normal conditions would get monitored, so we can connect up and try to figure out how that's reflected; or if it's going got be in a future revision, I can hold and wait for it.

MR. STUTZCAGE: Thanks.

MR. SNODDERLY: This is Mike Snodderly from the ACRS staff. So, NuScale, can you weigh in on that at this time? Are there plans to do that in Rev. 2, or is that something that's still under discussion?

MR. OSBORN: This is Jim Osborn. Can you guys hear me?

MR. SNODDERLY: Yes, Jim. Go ahead.

MR. OSBORN: Yes. So I think that Ed was right. The radiation monitors for air cooled condenser is described in Table 11.5-1. I'm not aware that Rev. 2 of the FSAR is going to change that in regards to 11.5-4 and the air cooled condenser. But, yes, there's steam air ejectors associated with the air cooled condenser. There's the vacuum pump that has a gaseous effluent and then the condenser air removal common vent line.

So all these associated with the ACC, the air cooled condenser, is provided in the design for radiation monitoring. And I should also note that the

condenser, just like a traditional condenser, is held at a vacuum, so any leakage is going to be in-leakage, as opposed to leakage out to the environment.

MEMBER HALNON: So this is Greg. That's true, as long as you've got a vacuum. I mean --

MR. OSBORN: That's true, yes, as long as you have vacuum, which is when the plant is operating, yes.

MEMBER HALNON: Okay. I'll go back and look at the tables again and see if I can piece together. I understand what you said, and I understand traditional condensers. I'm just trying to get it straight in my mind how the difference from going from a water situation to an air situation from inside a building versus outside in the atmosphere and how all that translates into the off-normal response. But I'll take a look at it again and see if I can piece together what you said.

MR. OSBORN: Okay.

MR. GRIFFITH: May I pitch in, as well, for Jim's answer here? Just to add, there's also tech specs for primary to secondary side leakage that also control the amount of primary to secondary side transfer of water or steam, if you will.

And the other note I'd like to make is

that there was a comment on the efficiency of the air cooled condenser, and NuScale has sized the air cooled condenser to handle what I would consider some pretty extreme ambient air temperature without a significant loss in performance.

MR. TESFAYE: Joe Ashcraft, your hand is up.

MR. ASHCRAFT. Yes. This is Joe Ashcraft. I was a technical reviewer for Chapter 7. I just wanted to note that, in Chapter 7, Table 7.1-7, which is the summary of post-accident monitoring variables, and it lists the condenser pump exhaust for a Type E variable, and it points back to Table 11.5-1. So a lot of these radiation detectors that you're discussing here will show up on that table, so you might want to take a look at that, as well.

MEMBER HALNON: Thank you. I'll add that to my list of stuff. I guess, just in general, the description, well, I guess we could have avoided this whole thing if there was a few lines added; but, nevertheless, I'll take a look at it. Thanks.

CHAIR KIRCHNER: Okay. Members, this is Walt Kirchner. Mike, I think we're at a stopping point, unless there are more questions from the members at this juncture. Hearing none --

MR. SNODDERLY: I agree, Chairman Kirchner, that we've completed Chapters 10, 11, and 13 now. It would be a good time to break for lunch and then return when you see fit, and we would complete Chapters 2 and 17, not including Section 17.4.

CHAIR KIRCHNER: Right. And since the agenda showed an hour break, I would propose then that we reconvene at 1:00 Eastern Time. That will allow us out on the west side to have coffee while you're having lunch. And if there are no other comments at this point, then we are recessed until 1:00 Eastern Time.

Thank you to the presenters. We are recessed.

(Whereupon, the above-entitled matter went off the record at 11:58 a.m. and then went back on the record at 1:02 p.m.)

CHAIR KIRCHNER: Good afternoon, everyone. This is the NuScale Subcommittee. And we are going to return to presentations from NuScale starting with Chapter 2. Tyler, I see you on the screen. Are you up?

MR. BECK: Yes, I'm up.

CHAIR KIRCHNER: Go for it.

MR. BECK: This is Tyler Beck again. As

discussed earlier, I am a licensed engineer within the NuScale's Regulatory Affairs Department. And I will be presenting Chapter 2, which is Site Characteristics and Site Parameters.

Next slide. The sections of Chapter 2 we're showing here on the screen. And noteworthy is Section 2.0 includes the key parameters table, which is much of the content of Chapter 2.

Section 2.1 is geography and demography. Section 2.2 is nearby industrial transportation and military facilities. Section 2.3 is meteorology. Section 2.4 is hydrologic engineering, and Section 2.5 is geology, seismology and geotechnical engineering.

And I wanted to add this is a largely site specific chapter as a whole. And each subsection or each section includes the goal item to ensure that the applicants will provide the site specific values downstream.

Next slide. For Section 2.0, this presents the key site parameters table, Table 2.0-1, and similar to the DCA, these parameters are representative of a reasonable number of potential plant site locations in the U.S., and applicants will verify the site specific parameters.

Next slide. So now that we're in the

individual sections, I am specifically going to highlight changes from the DCA. And for geography and demography in Section 2.1, there is really one change and that has to do with the distance for the exclusionary boundary and the low populations zoned outer boundary. And this is 369 feet from the nearest release point in the SDAA. In the DCA this was 400 feet.

This change is really just due to the change in site configuration as a whole. And that is the only change from the DCA for Section 2.1.

Next slide. For Section 2.l2, it is pretty much the exact same as the DCA. All that is in this section, is one COL item that tells the applicants to describe the nearby industrial transportation and military facilities. So the SCA does not postulate these hazards.

Next slide. For Section 2.3, meteorology, the meteorological parameters are largely unchanged from the DCA. There are really two changes. And so the first of those is with respect to the design basis tornado. And the SDAA includes a more limiting design basis tornado so that just encompasses more potential sites.

And then the other change is with regard

to atmospheric dispersion values. And these values have changed just due to different source receptor distances. For the values at the exclusionary boundary, they are similar to the DCA, but as we explained, it is just a different 369 feet versus 450 feet of the DCA. So their values are a little bit different.

For the values at the main control room, they are actually lower than the DCA values. And for the routine release values at the restricted area boundary, these are also lower than the DCA values.

So that encompasses all the changes in Section 2.3 from meteorology.

MEMBER HALNON: Tyler, this is Greg Halnon. I've got a quick question. And I didn't go through the design cert process so forgive me if I'm re-raking old ground.

The precipitation studies that were used are very old, HMR 52 includes storms from pre-1980s. How are you going to ensure that your flood levels are -- your flood level protection is adequate for the more modern storms that we are experiencing?

MR. BECK: Do we have Nolan or Paul on the call, if you're available to answer that? So for your question, I mean, there is the sea level item that

applicants will have to confirm and justify the site specific meteorological parameters if that helps to answer --

MEMBER HALNON: I get that, however, your flood protection in this section and the next section are based on the precipitation studies done back in that HMR 52 and that was issued in 1982-1983 time frame, which, you know, over 40 years ago.

So, I guess, how can we say that the floor protection that was designed based on the precipitation studies and other old studies, how are we going to ensure that is going to be adequate going forward for someone in an SDAA?

Is there some -- and maybe this is a better question for the staff, it would be a good chance for you to pawn it off on them. But, I don't know -- I don't understand how we can approve a design that we can't assure that the flood protection is adequate?

MR. BECK: I'm not sure on the studies at this moment. I do know that the ultimate conclusion is that the max flood is one foot below the baseline elevation of the plant. And so by ensuring that the maximum flood is below base elevation, that is key to our flood protection.

MEMBER HALNON: Okay. So that's -- your plant parameter is whatever the flood level is at the site that is chosen, it's got to be -- you have to have a one foot margin to the max flood.

MR. BECK: Yes.

MEMBER HALNON: So I will ask the same question of the staff about how they're going to assure that the newer studies are being used. So go ahead, you can move on. I think it's more of a question for the staff. Thanks.

MEMBER BIER. Excuse me. This is Vicki Bier. I just wanted to expand on Greg's remarks, not that I need an answer right now. But in addition to possibly changing precipitation levels, there is also a lot of evidence that economic development increases flooding because you pave over a much larger section of area and so, you know, there is less rainfall that goes into the groundwater, et cetera. So it's a generic issue. It's not you know, directly related to NuScale in any way. But --

MEMBER HALNON: You can go on. I think both Vicki and my comments relative to site specific -- which I know that you're staying away from in this chapter, however, there is a basis for some of the flood levels and building locations. So we'll explore

a little bit later with the staff and see how they're going to assure that the flood levels are -- or the right studies are being used.

DR. BLEY: This is Dennis --

CHAIR KIRCHNER: We have -- Dennis and Steve have their hands up. Go ahead, Dennis.

DR. BLEY: Yeah. Same issue. It seems to me that when a COL applicant comes in, they will have to justify the studies they use for flooding calculations. And this kind of goes back to the staff, too.

The fact that you used some older studies doesn't in any way approve using older studies when a COL comes up. So I guess I would refer that to the staff when they come up unless you guys have thoughts on it.

MR. BECK: No, I don't think we have any additional input on it right now.

MR. GRIFFITH: Tyler, just I will add one thing here. Thomas Griffith, the licensing manager. You know, one of the approaches with Chapter -- with specifically Chapter 2 is that, as Tyler said in one of the introduction slides, is that generally Chapter 2 is representative in bounding a number of site locations that we feel would be bounding and

representative of a number of site locations that would be acceptable to that end.

There is a number of COL items, particularly like ones that relate to meteorology, that would need to be satisfied when we get to the steel well stage. And that would ensure that the site specific characteristics are met and the assumptions in the standard plant design are met.

MEMBER HALNON: Yeah, and Thomas, I appreciate that. I didn't see any COL item that drove into the studies. The recently signed Infrastructure Bill would include almost a half a billion dollars for NOAA to go off and re-study a bunch of stuff and one of those is the PMP studies. So they are looking to revise HMR 52.

And I'm just not sure how that gets back into the SDAA, which the SDAA site parameter envelope was established using that 40-year-old study. So I'm kind of looking for linkage in how we ensure that COL applicants in the future will be not relying on an envelope that's basically on a dated study. So that's the basis of the question there.

CHAIR KIRCHNER: Steve, did you have your hand up?

DR. SCHULTZ: Yes. This is Steve Schultz.

A question on the last set of bullets that you have on the slide here.

The atmospheric dispersion values, as you've indicated, they are similar to the DCA values. And the staff has noted that. You do have a change in the exclusion area boundary. And 400 seems like a nice round number, and 369 seems pretty precise. Is there an intention to use that difference in any particular way?

MR. BECK: The reason for that difference is because the site layout -- so it's 369 feet from the nearest release point. And for the SDAA site layout, 369 feet is a distance from the south turbine wall to the south site boundary. So it's just that limiting distance from the release point to the site boundary.

DR. SCHULTZ: Understood. And the same is true with respect to distances and elevations with regard to the dispersion values for the main control room, just slight differences in the configuration that you see between --

MR. BECK: Yes.

DR. SCHULTZ: -- the DCA and the MCR -- I mean, in the -- yeah, the -- and then you add on here that routine release values are lower than the DCA

values. How much lower? How does that impact what you've described here?

MR. BECK: They are in Table 2.0-1. I don't have the table up right now.

DR. SCHULTZ: Just generally.

MR. BECK: I don't have a percent difference in how much they are lower.

DR. SCHULTZ: I can look at the table. Thank you.

MR. BECK: All right. Are there any other questions for this slide? All right. We'll go to the next slide.

So this is Section 2.4, which is hydrologic engineering. And this section is nearly unchanged from the DCA. The only change -- so there's a lot of words on the slide. But really the change is in the COL Item 2.4-1.

So in the DCA -- well, so this COL item excludes a few sections from it. So you can see it excludes Sections 2.4.8, 2.4.10, 2.4.11. The change from the DCA is that addition of the exclusion of Section 2.4.11. And that, I believe, is mainly just due to the fact that there is no circulating water system in the SDAA. And so low water considerations are of much less concern. Other than that, there are

no changes from the DCA.

All right. We'll go to the next slide. And this is Section 2.5, geology, seismology and geotechnical engineering.

This section, like all the other sections is site dependent. And for Subsections 2.5.1, 2.5.2, 2.5.3 and 2.5.5, they are unchanged from the DCA. We have also added that 2.5.2 includes the certified seismic design response spectra. And these are unchanged from the DCA. And this is addressed in MSR Section 3.7.

The changes from the DCA are with respect to -- is there a question? The changes from the DCA are with respect to Section 2.5.4. So the bearing capacity and settlement values have changed in the SDAA. But for the comparing capacity values, this is mainly attributable to the fact that the SDAA was allowable soil bearing capacity whereas the DCA listed ultimate soil bearing capacity. And then the settlement values, my understanding is the changes are really just due to the fact that they are different buildings with different sizes and geometries. And that is the changes from the DCA for Section 2.5.

Next slide. During the audit, there were 10 audit items that were successfully resolved. And,

next slide. And that is it for Chapter 2 if there are any other questions. All right.

CHAIR KIRCHNER: Okay, Tyler.

MR. BECK: With that, I will hand it over to Amanda Bode for discussion for Chapter 17.

MS. BODE: Good afternoon. My name is Amanda Bode. And I have been a licensing engineer with NuScale's Regulatory Affairs Department for the last year and a half. And one of my focus areas is Chapter 17.

Prior to NuScale, I worked 10 years in the nuclear industry in a variety of roles, including Appendix B compliance, engineering support of new construction for nuclear aircraft carriers and submarines and working as a nuclear machinist, maintenance engineering laboratory technician in the United States Navy.

I have a Bachelor of Science in nuclear engineering technologies and a Master of Business Administration with a concentration in project management.

Next slide, please. Please note that 17.4 is not included in today's presentation. It will be presented to the ACRS at a later date. And the majority of the content for Chapter 17-17.4 pertains

to quality assurance as identified on this slide.

Next slide, please. The sections applicable to the SDAA reference, the licensing topical report for the quality assurance program description, which is associated with Section 17.5. The applicant does have responsibilities to implement quality assurance during construction and operation.

Next slide, please. The licensing topical report for NuScale's quality assurance program description establishes compliance with 10 CFR 50, Appendix B, 10 CFR 52 and 10 CFR 21 and is based on the requirements and recommendations of ASME NQA-1 2008 with 2009 addenda Parts 1 and 2, as endorsed by Regulatory Guide 1.28, Revision 4.

The safety evaluation has been published and the approved version has been docketed.

Next slide, please. There were no RAIs and no audit questions associated with Chapter 17 minus Section 17.4. And I will hold here if anybody has any questions.

Okay. As I'm not seeing any questions, this concludes NuScale's presentation.

CHAIR KIRCHNER: Amanda? This is Walt Kirchner. Earlier today, we heard from your colleagues about Chapter 10. And I noticed one, I

think, important change, actually a good change from a safety perspective is the treatment and seismic category classification for the first valves on the feedwater and steam lines outside containment, the isolation valves.

Does that change the treatment of those? I know we are not talking about your reliability assurance program. But could you just address what that means in terms of the quality treatment of those valves in your program? Are they afforded any extra inspection or -- what are the implications of changing from Seismic Category 2 to 1 and what does that entail in terms of quality assurance?

MS. BODE: I am not familiar with the valves that you just mentioned. You did identify that they were for Chapter 17 -- sorry.

CHAIR KIRCHNER: No, Chapter 10.

MS. BODE: Chapter 10.

CHAIR KIRCHNER: Yeah.

MS. BODE: Okay. So in terms of seismic categories, seismic category is addressed in Section 3.2, which will be presented at a later date because it is not identified as a low effort chapter.

CHAIR KIRCHNER: Okay. Let me just put a note then just to flag that. I would be interested in

why NuScale made that decision -- I think it's a good one -- and what the ramifications are in terms of quality treatment, et cetera, for that, if you will, second line of defense and isolating the feedwater and the steam system from the reactor module.

MR. BECK: Is the question --

CHAIR KIRCHNER: You don't have to address it further here. Yeah.

MR. BECK: Hey, Walt. I believe that you are describing the secondary main steam isolation valves being Seismic Category 1?

CHAIR KIRCHNER: Yes.

MR. BECK: Someone, and correct me if I'm wrong, I don't believe that's a design change from the DCA.

CHAIR KIRCHNER: Oh, okay. If it's not then, the way I read the slides and the presentation and the material, it seemed like you had upgraded the classification of those valves in the SDAA. And that sounded like a good design change. So it's not a change? Okay.

MR. BECK: No. And I'm sorry if that was confusing. I believe I bolded the things that were changes, but I probably should have highlighted that better.

CHAIR KIRCHNER: Okay. Thank you.

MS. BODE: As I stated, if there are no further questions, this does conclude NuScale's presentation.

CHAIR KIRCHNER: Okay. Thank you very much. Members, any questions of NuScale? Well, then, Mike, I think we are ready to turn to the staff's presentations on these two chapters, please.

MR. TESFAYE: Good afternoon. This is Getachew Tesfaye. The NRC project manager for Chapters 2 and 17 is Prosanta Chowdhury. Prosanta, take it from here.

MR. CHOWDHURY: Yes. Good afternoon, Chair Kirchner, members of the ACRS subcommittee, NuScale staff and management, NRC staff and management. My name is Prosanta Chowdhury. I am a senior project manager at New Reactor Licensing Branch under the Division of New Licenses in NRR.

I have been a project manager for 14 years in new reactor licensing. I have a master's degree in nuclear engineering and one in electrical engineering. And I have been employed at the NRC since 2005.

I have been heavily involved in NuScale DCA application review also from 2016 through 2020 and including the rulemaking.

So Chapter 2, site characteristics and site parameters, as NuScale mentioned -- can you go to the next slide, please -- this is essentially a site-related chapter, site specific chapter mostly.

So NuScale submitted Chapter 2, Site Characteristics and Site Parameters, Revision 1, back in October of 2023.

And then the NRC staff performed -- they usually audit as part of this review of this chapter from March 2023 through August 2023.

There were some questions raised through the audit and were resolved in the audit. No RAIs were issued.

The staff completed the review of Chapter 2 and issued an advanced safety evaluation report to the ACRS Subcommittee meeting. The report was issued I believe on 10th of March as publicly available.

This slide shows the technical experts who were involved in this review. And let me extend my apologies to Sarah Tabatabai, whose name has been unintentionally not included in this slide. So she is one of the reviewers, too.

So Ken See was the overall lead for the review of Chapter 2. And he also has the hydrology review section under his wings.

Kevin Quinlan is mostly in meteorology, Jenise Thompson in seismology, geology-seismology, Scott Stovall, geology-seismology. Luissette Candelario-Quintana and Zuhan Xi were involved in geotechnical engineering review.

And Ken Mott and Ed Robinson were also included in ensuring that the interface between some section of Chapter 13 and Chapter 2 have been adequately addressed. And they ensured that those have been.

So again I, Prosanta Chowdhury, am the PM, and Getachew Tesfaye is the lead PM as you have heard many times today.

So this slide shows the several sections, all five sections of Chapter 2, that NuScale also showed.

Next slide, please. So what the staff did is it looked at the DCA FSAR Chapter 2, Revision 5, and SDAA FSAR Chapter 2, Revision 1, to see what changes or significant differences between these two may have been made.

So the staff's conclusion for Section 2.0 is that there are really no significant differences between NuScale DCA FSAR and SDAA FSAR. NuScale provided site parameters that are representative of

potential locations in the United States and Table 2.0-1 provides a summary of these parameters that the staff used throughout their review of Chapter 2.

NuScale provided COL item appropriate and related to these areas of review. And the SDAA conclusion and DCA conclusion remain the same.

Next slide. This is specifically for 2.1, geography and demography. And, again, there are no significant differences. NuScale did provide an exclusion area boundary and low population zone outer boundaries that you have already heard from NuScale and then COL items for this area. And the conclusions remain basically the same.

And for Section 2.2, there are no significant differences again. And then NuScale did not postulate any hazards from the industrial, transportation or military facilities. This is site specific information that an applicant that references the NuScale power plant US460 standard design will address. And there is COL item in the rest of that.

So next slide, please. 2.3 Meteorology, SDAA revised the design basis to wind speed and associated characteristics to be more conservative than DCA. And then they devised, as you heard from NuScale, onsite and offsite chi over q dispersion

values supporting made therein, methodology the same, distances revised.

NuScale provided COL items related to this area of review, and the conclusion remained the same.

I know at least one subcommittee member has a question related to the data used on precipitation and maybe our reviewers who are standing by may be able to respond to that if asked and maybe the hydrology expert reviewer who is standing by also may be able to respond to that one.

MEMBER HALNON: This is Greg. I might just not understand how an SDAA is applied to a plant. Let me just postulate here for a second.

Someone comes in and wants to reference this SDAA, the standard design, they are going to pick a site, and they have to show that site is within the site, within the plant boundaries set up in the FSAR, which is from lack of a better -- let's just use the precipitation rate as an example, 19.4 inches.

So I guess when that application comes in for placing this plant on the site, that applicant is going to have to evaluate the site to the more modern standards, I assume. And if there is a new study out, they will have to use the study that is on the street. So just say it takes HMR 50, whatever prime

revised 52, they would have to use that, ensure the site would stay within the parameters of the plant design, which is 19.4 inches.

I can see how all of that could work. What requires that new site applicant to use the more updated studies rather than to use the HMR 52 that is cited in the FSAR for the standard plant design?

I guess that's the question is what's going to drive us to use more modern values for the specific site?

MR. CHOWDHURY: Yes. And thank you for the question. And we understand. Kevin Quinlan should be on the line to elaborate on that. Kevin, would you please?

MR. QUINLAN: Sure. So interestingly enough, this question also comes with meteorology but it doesn't generally fall within --

MR. CHOWDHURY: Please introduce yourself first.

MR. QUINLAN: Oh, I'm sorry. My name is Kevin Quinlan. I am the senior meteorologist here at the NRC and the reviewer for Section 2.3, meteorology.

So this question often comes up in meteorology but is mostly applied to the hydrology section. Right now our guidance points to the

hydrometeorological reports from NOAA. And certainly, as you pointed out, they are a little bit dated at this point. However, they are still considered to be extremely conservative.

And then when you build on the extra conservatisms that go into the actual modeling of a site, generally, it's a very conservative analysis.

Applicants for a specific site do have an option to do a site specific maximum precipitation analysis where they can use updated storms. We saw that updated in response to the Fukushima flooding questions, that there was an option there. But the hydrometeorological reports from the National Weather Service are still considered to be very conservative.

MEMBER HALNON: Yeah, I get the conservatism is basically because when they went off and studied these storms, they had to find some farmer with a can that collected all the precipitation, and they kind of estimated from there.

Forty years later, we are going to be getting an updated study, however long it takes NOAA to do that, probably, I don't know, it could be a decade for all we know. But certainly they are not going to be using cans in farm fields to estimate these things. So the conservatism is going to go

down. We don't know what the study is going to show other than if the gut feel is that the storm seemed to be getting more intense. And, you know, that's pretty subjective at this point until they do the study.

But I guess as we go forward, I am just curious -- I guess it's more than curious. I guess the site specific study needs to show or at least a site needs to show that it's within the plant parameter, which is 19.4 inches. What if it's not? I mean, what if this new study comes out and shows that it's not -- or maybe it adds more conservatism to where it's 20.2 inches or something to that effect? What drives the licensee or the prospective licensee to put more margin in their flood levels?

MR. QUINLAN: So I think it has a little bit less to do with the exact number on the rain rate, the 19.4 inches, and more to do with the ability of a specific site to cope with that amount of rain in their flood protections.

MEMBER HALNON: Okay. More drains, more creeks, more slope to their parking lots, that type of thing?

MR. QUINLAN: From my understanding. And, again, this generally is one of those situations where, you know, its meteorology until the water is on

the ground and then it's hydrology. So the hydrologists are generally the ones who do that analysis. However, that's my understanding is that it's -- you know, the site needs to prove that it can deal with or protect itself against a certain amount of precipitation.

MEMBER HALNON: Okay. So it's meteorology until it hits the ground. I get that.

MR. QUINLAN: Right.

MEMBER HALNON: But if they are not using the right meteorological studies then I'm wondering how they let people what volume of water they are going to be dealing with. And it just seems to me that there should be a COL item that says you need to use site specific issue rather than design it based on a 40-year-old plus. I mean, some of those storms go back into the 20s and 30s so I mean some of the storms are over 100 years old, but they are using to base their design on it. It just doesn't seem modern to put it that.

MR. QUINLAN: Certainly, yeah, they certainly did. I can see Ken See has raised his hand. And he is the lead hydrologist on this. Ken, do you want to jump in?

MR. SEE: Sure. Thank you very much. You

are right, NOAA is updating their flood standards.

MR. CHOWDHURY: Introduce yourself, please, Ken.

MR. SEE: Let me turn on my camera. Sorry about that. Yeah, my name is Ken See. I am the senior hydrologist in the Office of Nuclear Reactor Regulations, Division of Engineering and External Hazards.

You know, this reminds me of conversations with Dana Powers years ago on the committee. My experience has been that the HMR 51, 52 values remain conservative.

We've had a lot of experience, like Kevin said, with site specific studies and updates. But those updates tend to drive the rainfall rates down, not up. So at this point, you know, we're all waiting on NOAA, like you said, to provide updates.

That update is supposed to factor in climate change. I haven't attended any of those meetings. But the main thing is we're looking for adequate assurance of -- you know, reasonable assurance of adequate protection. So at this point, we don't have any reason to doubt those precipitation values. Those values have been used by every DC or in this case SDAA applicant for years.

A COL applicant who comes in will, according to this power plant envelope, doesn't appear to be relying upon flood protection. Some of our plants, older operating plants, rely upon flood protection. Given the maximum groundwater and maximum flood levels, they are supposed to be above that.

So when they apply the HMR 51, 52 flood scenario, they are going to be protected by the elevation of the plant.

But you're right. I mean, you're not the only person who has expressed concerns. There is also a lot of effort to go probabilistic. But once again, you know, my experience is everybody is looking to reduce the flood levels. They are not concerned about HMR 51, 52 being, you know, not conservative enough.

And regarding Vicki's question earlier, I'm going to head that off. She is exactly right. So typically in hydrology, we assume minimal groundwater infiltration. So when the rain hits the ground, the vast majority of it is treated as runoff and contributes to the flood. It doesn't infiltrate into the groundwater. So that's a good point. And we take that into consideration.

MEMBER HALNON: Okay. I just want --

MEMBER BIER: Yeah, go ahead, Greg.

MEMBER HALNON: Yeah, just one follow-up. The reason that our impression that the site specific studies always seem to go down is because no one does a site specific study unless the generic one is too much, and they know they can get less. So you wouldn't do a site specific study to show that my level is up above the other one. So anyway, that was, you know, from the last decade of experience that we've had. Go ahead, Vicki, I'm done.

MEMBER BIER: Thanks. Actually your comment is more or less exactly the point I wanted to raise.

First, I am in no way a hydrologist or a meteorologist or anything. So I am not taking issue with any of your comments, Ken. But if for example the new NOAA results -- you know, I kind of accept that the old NOAA results were conservative for what the meteorology was at the time.

But if the new NOAA results show higher rainfall or whatever and the old NOAA results are then not conservative for the current climate, the statement that the licensee has the option of using newer results is kind of not very encouraging. So that's just -- again, it's not specific to NuScale necessarily, just a generic issue but.

MR. SEE: Yeah, I mean, as the agency gets new information, we'll have to adapt, make necessary changes. You know, we're all about safety. So we're not going to just stick to an old position if we have evidence that says, hey, that's going to lead to an unsafe condition.

So we're monitoring this very frequently. The Office of Research is involved as well. So we try to keep our finger on the pulse of the community of practice and stay aware.

MEMBER BIER: Okay.

MEMBER HALNON: Then you're talking backfit so rather than building it in upfront by saying you have to use the most recent study. You're building in the requirement to have to backfit somebody.

MR. SEE: Well, unfortunately, we don't have that study up from NOAA yet, I mean --

MEMBER HALNON: Yeah, I know, like I said, it could be a decade. You don't know how long it's going to take.

MR. SEE: Maybe Kevin can speak to this. He may have attended a few meetings. I think they put on a tentative timeline. I remember it being a little quicker than that. But I will turn it over to Kevin

to address that.

MEMBER HALNON: I have no knowledge of the timeline. I'm just saying that certainly these plants will be built if the end of the timeline does come out they are going to be built for more than a decade out.

So certainly my guess is the very first plant that gets built in the U.S. may just have a new study already established. And we're basing the plant design parameters on an old study. So if that's the position that you're going to backfit, if it needs to be, that's fine. That's a pretty high bar though.

MR. SEE: If there's an immediate safety concern, then we can bypass certain things. But, Kevin, do you got any information on the timeline?

MR. QUINLAN: I don't recall the exact date, but I did attend a couple of the National Academy of Science meetings early on in the process when they were trying to find the scope of the studies.

And for some -- I think somewhere in the 2028 time frame is what they are looking at to update the precipitation values. You know, if there is need, I can try to find the exact dates. I just don't remember off the top of my head.

MEMBER HALNON: It's not needed. It's

more principle.

MR. QUINLAN: Sure. I understand.

MEMBER HALNON: It's not so much -- I think we understand the comment. It just seems obvious that we would maybe even acknowledge that this is an old study and that -- but I get that you feel it's conservative. And I trust your judgment on that one so.

MR. QUINLAN: So to Ken's point, I guess just to put a cap on it, during the Fukushima reviews, we did a comparison between all the sites that came in with a site specific PMP study and compared it against the HMR values. And they were on the order of, across the board, of around 20 percent less for the site specific studies, which supports your point that nobody is going to come in and do a site specific study that raises their flood level. But it also points to the fact that the HMRs are quite conservative.

And then we did a rigorous inspection and review of all the site specific studies at the site that came in for review just to make sure that they weren't providing an inadequate application.

MEMBER HALNON: Okay. Well, I think that the overriding comment is given all the attention on

climate over the last several years, and it doesn't look like it's going to go away anytime soon, why would we not acknowledge that and require a site specific PMP study for new sites?

So I get it that you think it's conservative and that you're probably okay and that new information comes in you will probably have to address it some way. It leaves a little bit of uncertainty in the future. But I'm satisfied that you guys at least you're watching it fairly closely.

MR. QUINLAN: Yes. Thank you.

MR. SEE: Thank you.

MR. CHOWDHURY: Thank you. Thanks, everyone. So we can move to the next slide please.

DR. SCHULTZ: Could you hold on one moment?

MR. CHOWDHURY: Okay. Sure.

DR. SCHULTZ: This is Steve Schultz. With regard to the revised onsite and offsite chi over q values, I recall that the staff did a very thorough review and confirmatory evaluations associated with chi over q for the COL. Just could you describe the level of review that was done here?

MR. CHOWDHURY: Do you mean from the DCA?

DR. SCHULTZ: Yes. No, no. I'm familiar

with that, but for the SDAA.

MR. CHOWDHURY: For the SDAA.

DR. SCHULTZ: In doing the review and making the comparison, what particularly did you examine?

MR. QUINLAN: This is Kevin Quinlan again, the meteorologist. So we looked at what the provided and compared it against previous designs. So really given that atmospheric dispersion is very, very site specific and in this case when reviewing a design, there is no site, really all we can go by is comparing against previous designs and what had been done for previous design certifications as well as previous COL sites.

So just to show that it can be cited somewhere at a reasonable number of sites, that's really the threshold that we aim for for this kind of review.

DR. SCHULTZ: Good. Thank you.

MR. QUINLAN: Sure thing.

MR. CHOWDHURY: Okay. Anything else on meteorology? I can move to the next section. Okay. So we are in hydrology section. And once again there are no significant differences between the DCA FSAR and SDAA FSAR.

There are COL items that have been provided for the hydrologic characteristics of the site referencing the standard design. And the conclusion in the SDAA is pretty much the same as the conclusion in DCA safety evaluation.

So if there are specific questions, we have Ken See here to answer, please.

If none, we can move to the next slide, please. Okay. So this is Section 2.5 So we have a breakdown here, 2.5.1, 2.5.2 and 2.5.3. For these sections, again, staff didn't see any significant differences between the NuScale DCA FSAR Revision 5 and DCA FSAR Revision 1.

NuScale did provide COL items that were needed for the geology, seismology and geotechnical characteristics of the site referencing the standard design. And it is the conclusions that the staff made is pretty much the same as the design certification SE conclusion.

Next slide, please. 2.5.4 and 2.5.5, geotechnical engineering, once again, no significant differences. And NuScale provided the necessary site parameters and COL items needed for functions to build, to design, analysis and stability evaluations.

So the parameters are provided in Table

2.0-1, as we mentioned before, and then the conclusions in these two designs basically remain the same.

That concludes Chapter 2 presentation by the staff.

CHAIR KIRCHNER: If there are no questions, then Getachew, we could go on to -- I believe we are going on here to 17, yes?

MR. CHOWDHURY: Yes. So Chapter 17, again, this is Prosanta Chowdhury. I am the project manager for this chapter. As I mentioned before, for the record, I am a senior project manager in New Reactor Licensing Branch under Division of New and Renewed licenses in NRR at the NRC. I have been with the NRC since 2005 and 14 plus years as project manager for new reactor licensing.

So this slide shows that when Chapter 17 was submitted, Revision 1 was submitted on October 31, 2023. NRC staff performed an inquiry audit as part of its review. And the audit was conducted between March 2023 to August 2023. There are no audit questions for this section -- for this chapter. When I say sections, I mean minus Section 17.4. And no RAIs were issued.

The staff completed the review of Chapter

17 and issued an advance safety evaluation report to support the ACRS Subcommittee meeting. I believe the advance safety evaluation report was made publicly available the third week of June or February or the second week of February this year.

The one and only reviewer, contributor, is Frankie Vega, who is with us and available for any questions. And he and the lead project manager, Getachew Tesfaye, is the lead PM was we mentioned before.

Next slide, please. These are the sections in Chapter 17. Notice that Section 17.4 is a grayed out. I want to say this is reviewed as a high effort section. And it will be presented separately later. So other than that, 17.1, 17.2, 17.3, 17.5 and 17.6 are the sections here.

Next slide, please. So Chapter 17, there are really no significant differences between NuScale DCA FSAR Chapter 17 and SDAA Chapter 17. Both reference approved versions of NuScale's QAPD quality assurance program descriptions. DCA FSAR Chapter 17 references Topical Report QAPD for NuScale Part MPTR 1010-859-M and SDAA references Topical Report MN-12-122626-A, Revision 1.

And the SDAA conclusion remains the same

as the DCA conclusion. So that concludes Chapter 17 formal presentation. Are there any questions?

DR. BLEY: Yes. Dennis Bley. This is an old question. You guys have answered it for us in the past, but I don't remember. We used to just talk about SERs and SEs and now you have advanced safety evaluation reports. What's the difference?

MR. CHOWDHURY: Okay. Advanced safety evaluation report is issued for ACRS to review. And then if there are any questions, comments, anything that staff needs to address in the final version after the ACRS meetings and any other changes that might come, including the latest revision of the design application that we will expecting when the design will be chosen, that will be incorporated and the final safety evaluation will be issued at that point, which is in Phase D. So that's the difference.

DR. BLEY: Thank you. It's not final yet. And obviously that's something like improved or better. Okay. Thank you.

MR. CHOWDHURY: Yes, that's what I just explained. Yes, please, so someone else has hands up?

MR. SNODDERLY: Getachew, this is Mike Snodderly from the ACRS staff. Could you do us a favor and read on to the record what the major change

was for Revision 1 of the QAPD? I believe it endorsed the 2008 version of the NQA-1, which was an updated -- which was a later version that was then endorsed in Rev. 5 of the previous QAPD. Is that correct, Frankie or -- Prosanta or Frankie?

MR. CHOWDHURY: Yeah, Frankie is here. Frankie, would you please respond to that?

MR. VEGA: Thank you. So this is Frankie Vega. I'm a technical reviewer in NRR DRO, Division of Reactor Oversite in the Quality Assurance and Vendor Inspection Branch. And as Prosanta mentioned, I was responsible for reviewing Chapter 17 of the SDAA, specifically Section 17.1, 2, 3 and 5.

So, yeah, so the DCA QAPD and the SDAA QAPD were both based on NQA-1 2008 and 2009 addendum. So both use NQA-1 Version 2008 as the basis for the QAPD.

DR. BLEY: Okay. And were there any other significant changes or maybe the NuScale can -- what was the difference or the change?

MR. VEGA: There was no significant differences. The only thing worth pointing out, it's the SDAA QAPD made reference to the most updated versions of the Reg Guides, Federal Reg Guides. That includes Reg Guides 1.29, 1.26,and several others.

Other than that, there was no major differences between the QAPDs.

DR. BLEY: Okay. Thank you very much.

DR. SCHULTZ: Prosanta, this is Steve Schultz. Just one question that probably has to do with the schedule coming up. But the NuScale presentation showed that an NRC inspection was performed for the QA program February 26 to March 1.

MR. CHOWDHURY: Yes.

DR. SCHULTZ: I don't know if there's any findings or audit exit information you can provide related to that audit or you can let us know when the audit report will be out?

MR. CHOWDHURY: Yeah, I will just highlight one thing here. Thank you for the question. And thank you very much for chiming in. So the staff did the first QA inspection for the SDAA February 26 through March 1. And then staff will be issued an inspection report within 45 days after completion of the inspection.

And at this point, anything that they have discovered found is pre-decisional. So Frankie, do you want to speak to that without, you know, any -- talking about anything else that is decisional really?

MR. VEGA: Yes, I don't have anything else

to add. As you mentioned, the inspection report should be issued 45 days after our exit meeting, which was March 1. So by April 15, we will have the inspection report issued and made publicly available.

DR. SCHULTZ: Thank you.

CHAIR KIRCHNER: Okay. At this point, are there other questions of NuScale or the staff from members? If not, then Mike at this point I think we can turn to the public and see if there is anyone either present with you or online who wishes to make a statement.

Are we going to read the one submittal that you had into the record?

MR. SNODDERLY: Well, I have to apologize. That was a cut and paste error. That was the open item from our previous NuScale meeting so (simultaneous speaking).

CHAIR KIRCHNER: That's what I thought Okay. No, that's fine, Mike.

MR. SNODDERLY: So Harold Scott's comment is well-published. And that was for the subchannel meeting. I did not proofread well enough and missed it. There were no written comments. But I do know that Ms. Sarah Fields and Tim Polich are two members from the public that are on the line. I don't know if

they have any -- or any other member of the public. There are no members of the public --

CHAIR KIRCHNER: In the conference room.

MR. SNODDERLY: Right, in the conference room. But we should ask if there's anyone --

CHAIR KIRCHNER: So members of the public, if you wish to make a comment, you need to unmute your mic, state your name, affiliation if appropriate and place make your comment.

MR. POLICH: This is Tim Polich with RoPower Nuclear. And my question has to do with the staff Slide 39. It was for NuScale Chapter 13.4 review. And what I was trying to understand was the second bullet there was removal of the reactor vessel material surveillance program. Is that because that was removed because the exemption request is in?

CHAIR KIRCHNER: Okay. Normally, it's our practice to take comments from the public and not in real-time answer. Can you take that for the record, Mike, at this point? And if the staff does want to answer that, Getachew, that's at your discretion.

MR. TESFAYE: I don't believe that -- this is Getachew Tesfaye. But I can give that to Mike for the actual response.

CHAIR KIRCHNER: Okay.

MR. TESFAYE: But I don't believe there is time for any questions.

CHAIR KIRCHNER: That's fine.

MR. SNODDERLY: Yeah. So, Tim, I know that you plan to attend these meetings in the future as part of your work and interest for the RoPower. But, yeah, the public, it's exactly what Chairman Kirchner said. This is an opportunity for public comment. They can provide comments, and the committee considers those comments. We don't take and answer questions.

But, you know, if the staff for NuScale want to weigh in and answer that question, they may. But they do not have to. But your question is on the record. But there is no one --

MR. POLICH: Okay. I just didn't understand. I thought this was like the other meetings where I could ask a question of the staff. Okay. I'm sorry. I'll just make comments in the future.

MR. SNODDERLY: Yes.

MR. POLICH. Thank you.

CHAIR KIRCHNER: Other members of the public?

MS. WALKER: I have a question. I know

I'm not supposed to be asking questions now, but just a simple clarification if you could. Does this design plan to use higher enriched uranium and to what burnup is the design being evaluated for?

MR. BURKHART: Hi, Kalene. This is Larry Burkhart from the ACRS staff. So, yes, we will take your question. This is an ACRS meeting. And we do take comments as we said previously.

It's not really a question where, like other public meetings, where the staff holds where you may ask specific questions and get a direct answer unfortunately.

But I would imagine, having been in licensing, that the current regulations are in place and that this reactor is not being -- at this time, to be licensed under higher burn. Am I right in saying that?

MR. SNODDERLY: This is Mike Snodderly, and I agree with Larry Burkhart unless NuScale and the staff want to weigh in. But, yeah, my understanding is they are going to use existing fuel designs and existing burnups that are currently licensed for operating reactors.

MS. WALKER: That would be very relevant to a design analysis I would imagine. Thank you.

CHAIR KIRCHNER: Other comments? Okay. Then at this point, Mike, as part of our summary, we will note that we were previously planning to hear also Chapter 18. That will be deferred, I believe, to our August time frame. Is that correct?

MR. SNODDERLY: That is our next scheduled meeting.

CHAIR KIRCHNER: Yes.

MR. SNODDERLY: Does that sound reasonable to the staff the staff? Yes, that will be the plan.

And then I think also, we will work with the staff, but it does seem to make the most sense to include 17.4, reliability assurance program, as part of the Chapter 19 -- and the PRA and severe accident, Chapter 19. I think that would be the best fit. And we will try to schedule that in the future.

CHAIR KIRCHNER: Right. So right now we are looking at Chapter 7, 8, 9, 12 and now additionally 18 in the August time frame.

MR. SNODDERLY: August 22, sir. Yes, that is the plan, the current plan.

CHAIR KIRCHNER: Okay.

MR. SNODDERLY: But you're right, we still -- we're five months out. So, you know, that date may shift a day or two here. But that's the plan for

trying to do this integrated stage step review.

CHAIR KIRCHNER: Okay. So our next task before us is at our full committee meeting in April to take under consideration the reports that the lead members are preparing on the chapters that we heard today.

MR. SNODDERLY: Yes. That is -- that's the goal in the April meeting. And then we would forward those to staff so that will assist them in their planning to know whether they have a clean review or there is any other -- if there's any --

CHAIR KIRCHNER: Any other, yeah.

MR. SNODDERLY: -- items that need to be --

CHAIR KIRCHNER: Yeah.

MR. SNODDERLY: -- received further. Right now, I was keeping track all meeting. And I think everything has been addressed adequately by the staff and NuScale. And this would be a good time if a member disagrees with me, and there is something that they want to pursue further at the April meeting.

CHAIR KIRCHNER: Yes. That is what I wanted to do next. So members online and also there, if you have any particular issues that you wish to have addressed in the April full committee meeting or

deliberate on, this would be a good time to flag those so that Mike can work accordingly to be prepared.

MEMBER HALNON: Well, this is Greg. I would just like the staff to bring the process of how in a standard design without the reference to generic technical guidelines, how the EOPs will remain consistent going forward.

And I know there is probably some other either regulations, Reg Guides and/or NUREGs that drive that. I would just like to see that path defined for us. Does that make sense, Mike?

MR. SNODDERLY: It does to me. But I would like to heard Getachew or the lead Chapter 13 reviewer to say, we understand what you're asking for, and they will have something for us in April. So staff?

MR. VIVANCO: Hi, this is Ricky. Can everyone hear me?

MR. SNODDERLY: Yes.

MR. VIVANCO: Yes, Greg. I do understand the question. We are looking for how consistency among the EOPs will be carried through and future applicants referencing the SDAA. I will relay that question.

MEMBER HALNON: Okay. And it may just be

a list of the Reg Guides or whatever -- however the training programs are -- not training, but I'm sorry, the operating procedures of them.

But just the fact that you took GTG out of the SDAA tells me that there's got to be something else in the background that I'm just not seeing. So just, yeah, that pathway and how we're going to assure it would be good.

MR. VIVANCO: And maybe I can provide some clarification. In the DCA, and when we're trying to re-mute the system, right, the DCA clearly states that it's not an issue of finding on the GTGs themselves so the conclusion remains the same for the SDAA. But if --

MEMBER HALNON: Yeah, just the carry through of the reference. It just seems like we are loosening the assurance of consistency going down the road. And if there is something in the background that is assuring that same level of consistency in the EOPs then just kind of lay that out for me. Just a good road map would be good.

MR. VIVANCO: Sure.

CHAIR KIRCHNER: Okay. Other members?

MEMBER ROBERTS: Yeah, this is Tom Roberts. I never did get a crisp banter of how the

range or parameters coming out of the heat balance is used in the initial conditions for the Chapter 15 analyses. And maybe in April we can get a clearer story of how things like the wide variation of feedwater temperatures that would come from the ambient air temperature variation is accounted for.

If it's round-off air, that doesn't make any difference in the analysis. Whether it matters is the question I'm asking.

CHAIR KIRCHNER: Okay. Is this Tom -- I'm thinking here now. Is this something that we should -- since we discussed it with the staff, they could be prepared to address when we embark on Chapter 15, which is admittedly down the road. I'm not trying to punt on your request, but it seems to me that when they lay out the assumptions for Chapter 15, typically, and in my experience, it is that for the design basis events, they would take the most conservative assumptions as initial conditions going into the subsequent transient and accident analyses.

Is this something that we should start with when we embark on the Chapter 15 review?

MEMBER ROBERTS: I think that could work, Walter. The question is whether the heat balance would need revision or expansion based on the need to

have those conservative assumptions in Chapter 15. And if we were to conclude that or if they were to say that, then there is still the ability to go back and then change the heat balance or get that additional information.

If that's within the realm of what can be done once we've gotten done with Chapter 10, that sounds fine to me.

CHAIR KIRCHNER: Yeah, I was just thinking here in real-time. I was looking at, you know, the classic suite of analyses that are done in Chapter 15, undercooling, overcooling, et cetera.

We would probably start from conditions, balance of plant conditions that would be the most limiting challenges either based on tech specs or other input parameters to derive the Chapter 15 analyses, almost in a sense decoupled from the heat balance itself.

Do you see where I'm going with it? I mean, you could have a heat balance for different ambient conditions and such. But when they actually embark on the Chapter 15 analyses, then often the approach is to take -- have their very limiting boundary conditions as input to launch into the actual analyses.

MEMBER ROBERTS: Yeah, that may be. The RAI said that the heat balance is used to establish those initial conditions. And so there is some way to get from either the heat balance or some other set of bounding, you know, methodology to set the initial conditions for that? And that's really the nature of my question.

CHAIR KIRCHNER: Yes, mm-hmm.

MEMBER ROBERTS: So if there's no simple answer, we could certainly discuss that during the Chapter 15 review?

CHAIR KIRCHNER: Why don't we do that? You know, correct me if I'm wrong, but isn't one of the most important purposes in application of the heat balance is to essentially calibrate your system, your instrumentation, correct? I mean, but -- okay, I'll stop there.

MEMBER HALNON: You're right, Walt. You're right. The heat balance in itself is a tool used by many of the thermodynamic engineers, thermo engineers to --

CHAIR KIRCHNER: Right.

MEMBER HALNON: -- make sure that they get all the megawatts that they can get out of it without crossing any limits.

CHAIR KIRCHNER: Exactly. So I'm just thinking, Greg, that typically in your experience, your heat balance kind of -- is somewhat decoupled from the accident analysis other than one tries, again, to look at very conservative input assumptions.

MEMBER HALNON: You think of it as an instrumentation. I mean, it's a piece of the puzzle.

CHAIR KIRCHNER: Yeah.

MEMBER HALNON: I mean, you look at your primary heat balance and your secondary heat balance, you want to have a certain agreement --

CHAIR KIRCHNER: Right.

MEMBER HALNON: -- to some extent. But you don't calibrate your safety-related instruments to that. That's why, you know, we get the appendix cap rates and all that stuff. And the feedwater measurements and whatnot as we get better heat balances or better flow and whatnot. You know, everything starts to converge where you think you're right.

In itself, I don't think the heat balance sets any accident parameters. I think you have to do with codes and other things that you're doing.

CHAIR KIRCHNER: Right.

MR. SNODDERLY: Chairman Kirchner, I think

Tom Griffith had his hand up, but I don't know if he still -- Tom, did you have something you wanted to say?

MR. GRIFFITH: Yeah, I was just -- I appreciate the opportunity to speak on that. And just from the Chapter 15 standpoint, I was just going to point out that Table 15.0, App. 6, provides the module initial condition ranges that were considered for design basis evaluation.

CHAIR KIRCHNER: Right. Thank you. Mm-hmm. Okay. Members, any further comments? So we will look then ahead to April full committee to review your summary reports on each of the chapters. And with that, I think, Mike, unless I'm omitting something, I think we've concluded our business for today.

MR. SNODDERLY: I believe so, Chairman Kirchner. So to remind the members, if you have comments or questions that you want the lead member to consider, Member Halnon will be writing the memos for Chapters 2 and 13, Member Sunseri will be writing the memos for Chapters 10 and 17, and Member Petti for Chapter 12. So if you have any comments or concerns or things you want them to consider, let them know. And otherwise, we will take up these memos in April,

the (simultaneous speaking) recommendation.

CHAIR KIRCHNER: Thank you, Mike.

MR. SNODDERLY: You're welcome.

CHAIR KIRCHNER: And I think with that we are finished with our business today. I want to thank both NuScale and the staff for your presentations today and responding to our questions. And with that, we are adjourned.

(Whereupon, the above-entitled matter went off the record at 2:18 p.m. and resumed at 2:18 p.m.)

CHAIR KIRCHNER: I think that is correct, yes.

MR. SNODDERLY: Yes, this is the end of the meeting. There was no need -- and let's put that on the record. There was no need for a closed section. And so with that, Chairman Kirchner, if you could adjourn us, that would be great.

CHAIR KIRCHNER: So with that inclusion, we are now adjourned.

(Whereupon, the above-entitled meeting went off the record at 2:18 p.m.)

March 15, 2024 Docket No. 052-050

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

SUBJECT: NuScale Power, LLC Submittal of Presentation Material Entitled "ACRS Subcommittee Meeting (Open Session) Chapters 2, 10, 11, 13, and 17," PM-157982, Revision 1

The purpose of this submittal is to provide revised presentation materials for use during the upcoming Advisory Committee on Reactor Safeguards (ACRS) NuScale Subcommittee Meeting on March 19, 2024. The materials support NuScale's presentation of the subject chapters of the US460 Standard Design Approval Application. This letter, LO-162565 and enclosure, supersedes letter LO-158049, dated March 14, 2024.

The enclosure to this letter is the nonproprietary presentation entitled "ACRS Subcommittee Meeting (Open Session) Chapters 2, 10, 11, 13, and 17," PM-157982, Revision 1.

This letter makes no regulatory commitments and no revisions to any existing regulatory commitments.

If you have any questions, please contact Jim Osborn at 541-360-0693 or at josborn@nuscalepower.com.

Sincerely,

Thomas Griffith
Manager, Licensing
NuScale Power, LLC

Distribution: Mahmoud Jardaneh, NRC
Getachew Tesfaye, NRC
Michael Snodderly, NRC

Enclosure 1: "ACRS Subcommittee Meeting (Open Session) Chapters 2, 10, 11, 13, and 17," PM-157982, Revision 1

Enclosure 1:

"ACRS Subcommittee Meeting (Open Session) Chapters 2, 10, 11, 13, and 17," PM-157982, Revision 1

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ACRS Subcommittee Meeting
(Open Session)

3/19/2024

Chapters 2, 10, 11, 13, and 17

Acknowledgement and Disclaimer

This material is based upon work supported by the Department of Energy under Award Number DE-NE0008928.

Chapter 10

Steam and Power Conversion System

3/19/2024

Presenters:

Tyler Beck and Mara Swanson

Chapter 10 - Steam and Power Conversion System

- Section 10.1 - Summary Description
- Section 10.2 - Turbine Generator
- Section 10.3 - Main Steam System
- Section 10.4 - Other Features of Steam and Power Conversion System

Introduction

- Chapter 10 Overview
  - Section 10.1 – Summary Description (No slide included)
- RAI 10.1-1 and Audit Items
- ACCS Summary
- Radiation Protection and DBE Mitigation Features

Section 10.2 - Turbine Generator

- TGS – includes turbine, turbine gland seal, turbine lube oil, turbine control oil, generator, and generator air coolers
  - Main steam feeds turbine through the turbine control valve and stop valve
  - **TGS provides extraction steam to FW heaters**
  - TGS provides gland sealing steam – described in Section 10.4
  - TGS includes the turbine bypass system comprised of desuperheater and turbine bypass valve
- System is SC-III
- Generally Quality Group D, with limited exceptions in Table 10.2-2
- No safety-related or risk-significant SSC
- No major design changes from DCA

Section 10.3 - Main Steam System

- MSS includes piping immediately downstream of the MSIVs up to the TG skid
  - Includes nonsafety-related secondary MSIVs (and associated bypass valves)
  - Includes nonsafety-related MSSVs
- MSS is generally Quality Group D and SC-III
  - Limited exceptions identified in Table 10.3-4
  - Secondary MSIVs (and associated bypass valves) are SC-I
- No safety-related or risk-significant SSC
- Secondary MSIVs – included in TSs
- Design changes from DCA:
  - **Main steam of operating module is preferred auxiliary steam source for startup module**
  - **Extraction steam lines are now part of the TGS**

Section 10.4 - Other Features of Steam and Power Conversion System

- **ACCS serves as the main condenser**
  - ACCS condenses steam and provides adequate capacity for the FWS
  - ACCS includes capability for 100% load rejection
  - Not credited for DBE
  - Eliminated need for circulating water system
- FWS supplies feedwater with necessary flow, temperature, and pressure to the SGs
  - No substantial change from DCA
- TGSS provides gland seal steam to prevent leakage into/out of TGS
- **ABS supplies steam to auxiliary steam users when main steam is not available**
  - **DCA: low pressure and high pressure subsystems**
    - **High pressure for module heatup system heat exchangers**
    - **Low pressure for gland seal steam, deaerator, condensate polishing regeneration system**
  - **SDAA: auxiliary boiler and chemical skid subsystems**
    - **Serves as the low pressure system of the previous ABS when no module is available**
- SSC in above systems are generally Quality Group D, SC-III
  - Limited exceptions identified in Table 10.4-4
  - FWRVs and FCVs are SC-I
- No safety-related or risk-significant SSC

RAI 10.1-1 and Audit Items

- RAI 10.1-1:
  - NuScale revised RAI 10.1-1 and provided the nominal heat balance case in FSAR Section 10.1.
- 21 audit items successfully resolved
  - Only unresolved audit item was the heat balance request

ACCS Summary

- Air-cooled condensers were selected to allow for the licensee to place the US460 standard plant design in locations where water access is limited.
  - Eliminated the circulating water system
- Principal functions remain consistent with water-cooled condensers
  - Condense exhaust steam from turbine exhaust
  - Reduce dissolved oxygen level in feedwater
  - Maintain ACC vacuum condition by removing air and noncondensibles from the main condenser
  - Provide adequate capacity for condensate and feedwater system during normal operation

Radiation Protection and DBE Mitigation Features

- Effluent and process radiation monitoring is functionally similar to the DCA
  - Radiation monitors allow automatic system isolations and detection of primary-to-secondary leakage.
- Nonsafety-related equipment is credited for event mitigation by functioning as backup protection
  - This is unchanged from the DCA (e.g., secondary MSIVs).
- MPS Interfaces:
  - MPS actuation signals and PAM variables for steam and power conversion systems are unchanged from the DCA.

Acronyms

ABS	Auxiliary Boiler System
ACCS	Air Cooled Condenser System
CARS	Condenser Air Removal System
DBE	Design Basis Event
DCA	Design Certification Application
FCV	Feedwater Check Valve
FW	Feedwater
FWIV	Feedwater Isolation Valve
FWRV	Feedwater Regulation Valve
FWS	Condense and Feedwater System
MPS	Module Protection System
MSIBV	Main Steam Isolation Bypass Valve
MSIV	Main Steam Isolation Valve
MSSV	Main Steam Safety Salve
PAM	Post Accident Monitoring
SC	Seismic Classification
SG	Steam Generator
SSC	Systems, Structures, and Components
TBS	Turbine Bypass System
TGS	Turbine Generator System
TS	Technical Specification

Chapter 11

Radioactive Waste Management

3/19/2024

Presenters:

Seth Robison, Chelsea Lockwood, and Freeda Ahmed

Chapter 11 - Radioactive Waste Management

- Section 11.1 - Source Terms
- Section 11.2 - Liquid Waste Management System
- Section 11.3 - Gaseous Waste Management System
- Section 11.4 - Solid Waste Management System
- Section 11.5 - Process and Effluent Radiological Monitoring and Sampling Systems
- Section 11.6 - I&C Design Features for Radiation Monitoring

Section 11.1 - Source Terms

- Same methodology as DCA
- Updated source term information in Table 11.1-1 through Table 11.1-8
  - Resulting from the change in cycle length, increase in burnup, and change in thermal power
- Audit results
  - NRC review of the dose input and output files associated with the LADTAP and GASPAR code runs (A-11.1-1)
  - Explanation between the differences in the DCA and SDAA source term information (A-11.1-2)
  - Difference between the full power steam flow rate in Chapter 10 and the secondary coolant flow rate in Table 11.1-2. The more conservative secondary coolant flow rate was used in the dose calculation (A-11.1-3)

Section 11.2 - Liquid Waste Management System

- Changes from DCA
  - Removed COL Item on mobile equipment
    - The design allows for at least 30 days of holdup capacity. Description of mobile equipment is needed if there is less than 2 days holdup capacity.
  - Some component changes to the LRWS – concept remains unchanged
    - Similar to DCA - Use of filters, ion exchangers, and reverse osmosis
- Audit results
  - Removal of the COL Item (A-11.2-1)

Section 11.3 - Gaseous Waste Management System

- No changes from DCA
- No audit questions

Section 11.4 - Solid Waste Management System

- Minor system design changes
  - Hard piped connections between the RWBV and LRW and SRW tanks changed to hooded connections
- Audit results
  - Wording clarified regarding the two phase separator tanks and two spent resin tanks (A-11.4-1 and follow-up)
  - Use of mobile equipment wording change. Not needed for SRWS to meet processing requirements (A-11.4-2 and follow-up)
  - Review of the amount of storage space available for Class A waste (A-11.4-3)
  - Clarifying description of reverse osmoses filter membranes (A-11.4-4)
  - Clarification added to Figure 11.4-1 to differentiate between the drum dryer skid and dewatering skid (A-11.4-5)

Section 11.5 - Process and Effluent Radiological Monitoring and Sampling Systems

- Changes from DCA
  - Reduction in the number of modules and associated design changes between the DCA and SDA resulted in a net reduction in the number of radiation monitors
  - Auxiliary Boiler System
  - Circulating Water System eliminated
    - Dry Cooling (Air-cooled condensers)

- Audit results
  - Ar-41 for leak detection (A-11.5-1)
  - Monitor Alarms in the main control room (A-11.5-2)
  - Calibration requirement for radiation monitors (A-11.5-3)
  - Sampling Points (A-11.5-4)

Section 11.6 - I&C Design Features for Radiation Monitoring

- Design changes from DCA captured in Section 11.5

Acronyms

COL	Combined License
DCA	Design Certification Application
I&C	Instrument and Controls
LRW	Liquid Radioactive Waste
RWBV	Radioactive Waste Building HVAC
SDAA	Standard Design Approval Application
SDA	Standard Design Approval
SRW	Solid Radioactive Waste
SRWS	Solid Radioactive Waste System

ACRS Subcommittee Meeting
(Open Session)

3/19/2024

Chapters 2, 13, and 17

Acknowledgement and Disclaimer

This material is based upon work supported by the Department of Energy under Award Number DE-NE0008928.

Chapter 2

Site Characteristics and Site Parameters

3/19/2024

Presenter: Tyler Beck

Chapter 2 - Site Characteristics and Site Parameters

- Section 2.0 - Site Characteristics and Site Parameters
- Section 2.1 - Geography and Demography
- Section 2.2 - Nearby Industrial, Transportation, and Military Facilities
- Section 2.3 - Meteorology
- Section 2.4 - Hydrologic Engineering
- Section 2.5 - Geology, Seismology, and Geotechnical Engineering

Note: Chapter 2 scope is largely site-specific. Each Section includes a COL item to ensure the site-specific values are provided.

Section 2.0 - Site Characteristics and Site Parameters

- The NuScale Power Plant US460 standard design uses site parameters that are representative of a reasonable number of potential plant site locations in the United States. Table 2.0-1 summarizes these parameters
- Applicants will verify the site-specific parameters

Section 2.1 - Geography and Demography

- The NuScale Power Plant US460 standard design considers the exclusion area boundary and low population zone outer boundary are as close as 369 feet from the nearest release point (i.e., site boundary)
  - This is a change from 400 feet in the DCA
- The only change from the DCA is the exclusion area boundary and low population zone outer boundary

Section 2.2 - Nearby Industrial, Transportation, and Military Facilities

- The SDAA does not postulate hazards from nearby industrial, transportation, or military facilities
  - Nearby facilities and potential resulting hazards are entirely in the scope of COL Item 2.2-1
- No change from the DCA

Section 2.3 - Meteorology

- The NuScale Power Plant US460 standard design uses meteorological parameters that are representative of a reasonable number of potential plant sites in the US
  - Includes precipitation, design basis tornado/hurricane, snow loads, and other similar parameters
- Applicants will describe the site-specific meteorology
- Changes from the DCA:
  - SDAA considers more limiting design basis tornado than the DCA
  - Difference in atmospheric dispersion values pertains to a different source-to-receptor distance for the US460
    - Atmospheric dispersion values at the exclusion area boundary are similar to the DCA values (see Section 2.1 for change in exclusion area boundary)
    - Atmospheric dispersion values at MCR are lower than the DCA values
    - Routine release values are lower than the DCA values

Section 2.4 - Hydrologic Engineering

- The NuScale Power Plant US460 standard design does not rely on external water supply for the ultimate heat sink or safety-related makeup water. The design reduces the need for local hydrologic features for plant safety
- COL Item 2.4-1 requires an applicant to describe the site-specific hydrologic characteristics for sections 2.4.1 through Section 2.4.14, except Section 2.4.8, Section 2.4.10, and Section 2.4.11
  - 2.4.8 – Cooling Water Canals and Reservoirs
  - 2.4.10 – Flood Protection Requirements
  - 2.4.11 – Low Water Considerations
- No major changes to Section 2.4
  - Exclusion of Section 2.4.11 from COL Item 2.4-1

Section 2.5 - Geology, Seismology, and Geotechnical Engineering

- The NuScale Power Plant US460 standard design uses geologic, seismologic, and geotechnical engineering parameters that are representative of a reasonable number of potential plant site locations in the US.
- Section 2.5 is site-dependent
- 2.5.1 (Basic Geologic and Seismic Information), 2.5.3 (Surface Deformation), and Section 2.5.5 (Stability of Slopes)
  - No change from DCA
- 2.5.2 (Vibratory Ground Motion)
  - Certified seismic design response spectra (CSDRS and CSDRS-HF) are unchanged from the DCA
  - Addressed in Section 3.7
- 2.5.4 (Stability of Subsurface Materials and Foundations)
  - The bearing capacity and settlement values have changed in the SDAA

Audit Summary

- Resolution of 10 audit items during the staff's audit

Acronyms

COL	Combined License
CSDRS	Certified Seismic Design Response Spectra
DCA	Design Certification Application
HF	High Frequency
LPZ	Low Population Zone
SDAA	Standard Design Approval Application
SDA	Standard Design Approval

Chapter 13

Conduct of Operations

3/19/2024

Presenter: Beth Brewer

Chapter 13 - Conduct of Operations

- Section 13.1 - Organizational Structure
- Section 13.2 - Training
- Section 13.3 - Emergency Planning
- Section 13.4 - Operational Programs
- Section 13.5 - Plant Procedures
- Section 13.7 - Fitness for Duty

- NOT INCLUDED: Section 13.6 - Security

Section 13.1 - Organizational Structure

- Changes from the DCA
  - Minor editorial changes
  - No technical changes
- RAIs/Audit
  - No RAIs or Audit Questions

Section 13.2 - Training

- Changes from the DCA
  - Minor editorial changes
  - No technical changes
- RAIs/Audit
  - No RAIs or Audit Questions

Section 13.3 - Emergency Planning

- Changes from the DCA
  - Minor editorial changes
  - TSC changed elevation in the control building and went from seismic category I to seismic category II (fully compliant)
  - Revised the SDA to clearly state that the TSC displays use the same I&C networks used in the MCR but are configured to provide display only, no controls.
  - Went from three COL Items in the DCA to two in the SDAA
    - The DCA had separate COL Items for descriptions of the OSC and EOF and these were combined into one broader COL Item that requires the applicant to describe the emergency response facilities.
    - DCA COL Item 13.3-1 required the applicant to describe direct communication system or systems between the OSC and the control room and this was eliminated from the SDAA COL Items and included directly in the SDAA text.
    - Regulations were updated in the SDAA: 10 CFR 50.47 and 10 CFR 50 Appendix E were removed from the DCA COL Items, and the SDAA COL Items refer to 10 CFR 50 generally due to rulemaking in process during SDA development (new rule 10 CFR 50.160).
    - Removed reference to 10 CFR 52.48 because it is a standard design certification requirement
- RAIs/Audit
  - RAI 10097, Questions 13.3-1, 13.3-2, 13.3-3: Needed additional design descriptions to explain how the TSC meets NUREG-0696 and Supplement 1 to NUREG-0737
    - Section 13.3 was revised to add additional information to address RAIs

Section 13.4 - Operational Programs

- Changes from the DCA
  - Minor editorial changes
  - Removed Reactor Vessel Material Surveillance Program and Motor-Operated Valve Testing Program from the COL Item
    - Not applicable to US460 design
- RAIs/Audit
  - No RAIs or Audit Questions

Section 13.5 - Plant Procedures

- Changes from the DCA
  - Section 13.5.2.1 – removed discussion about Generic Technical Guidelines
  - Clarified and consolidated the information concerning how the Generic Technical Guidelines will be used to develop site specific emergency operating procedures into SDA COL Item 13.5-5, and then provide a process to maintain them in COL Item 13.5-3
    - The plant specific technical guidelines developed by a COL holder will be nearly identical to the Generic Technical Guidelines provided to the applicant prior to COLA submittal.
  - Renumbered COL Items
- RAIs/Audit
  - No RAIs or Audit Questions

Section 13.7 - Fitness-For-Duty

- Changes from the DCA
  - Removed two COL Items related to the operational and construction Fitness-For-Duty programs
    - An applicant referencing the standard design is responsible for providing an FFD program description and implementation as described in 10 CFR Part 26
- RAIs/Audit
  - No RAIs or Audit Questions

Acronyms

COL	Combined License
COLA	Combined License Application
DCA	Design Certification Application
EOF	Emergency Operations Facility
FFD	Fitness for Duty
I&C	Instrumentation & Control
MCR	Main Control Room
OSC	Operational Support Center
RAI	Request for Additional Information
SDAA	Standard Design Approval Application
SDA	Standard Design Approval
TSC	Technical Support Center

Chapter 17

Quality Assurance and Reliability Assurance

3/19/2024

Presenter: Amanda Bode

Chapter 17 - Quality Assurance and Reliability Assurance

- Section 17.1 – Quality Assurance During the Design Phase
- Section 17.2 – Quality Assurance During the Construction and Operation Phases
- Section 17.3 – Quality Assurance Program Description
- Section 17.5 – Quality Assurance Program Description
- Section 17.6 – Maintenance Rule

- NOT INCLUDED: Section 17.4 – Reliability Assurance Program

Chapter 17

Section	Description	Remarks
17.1	Quality Assurance during Design Phase	Described in Section 17.5
17.2	Quality Assurance during Construction and Operation Phase	Not applicable to SDAA. COL applicant describes the quality assurance program applicable to site-specific design activities and to the construction and operations phases.
17.3	Quality Assurance Program Description	Described in Section 17.5
17.5	Quality Assurance Program Description – Design Certification, Early Site permits, and New License Applicants	Does not address construction and design QA activities that begin at construction
17.6	Maintenance Rule	Not applicable to SDAA. The maintenance rule operational program is the responsibility of an applicant.

Section 17.5 - Quality Assurance Program Description

- Quality Assurance Program Description (QAPD) for the NuScale Power Plant US460 is provided in the NRC approved topical report
  - “NuScale Power, LLC Quality Assurance Program Description” (MN-122626-A, Revision 1)

- The NuScale Quality Assurance Plan is established in accordance with 10 CFR 50, Appendix B, 10 CFR 52, and 10 CFR 21 based on the requirements and recommendations of ASME NQA-1-2008 and NQA-1a-2009 addenda, Parts I and II, as endorsed by Regulatory Guide 1.28, Revision 4
  - Safety Evaluation published December 2023
  - NRC inspection of NuScale’s QA program performed February 26- March 1

RAIs and Audit questions

- No RAIs on Chapter 17 (minus 17.4)
- No Audit questions on Chapter 17 (minus 17.4)

Acronyms

COL	Combined License
QA	Quality Assurance
QAPD	Quality Assurance Program Description
RAI	Request for Additional Information
SDAA	Standard Design Approval Application
SDA	Standard Design Approval

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Presentation to the ACRS Subcommittee Staff Review of NuScale's US460 Standard Design Approval Application Final Safety Analysis Report, Revision 1

Chapters 2, 10, 11, 13, 17 (not including Section 17.4)

March 19, 2024

(Open Session)

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Presentation to the ACRS Subcommittee
Staff Review of NuScale Standard Design Approval Application
Final Safety Analysis Report, Revision 1

CHAPTER 10

March 19, 2024

(Open Session)

NuScale SDAA FSAR Chapter 10

Overview

- NuScale submitted Chapter 10, “Steam and Power Conversion Systems,” Revision 0 of the NuScale SDAA FSAR on December 15, 2022, and Revision 1 on October 31, 2023
- NRC regulatory audit of Chapter 10 performed March 2023 to August 2023, generating 23 audit issues
- NuScale submitted 10 pieces of supplemental information to address questions raised during the audit
- One RAI for Chapter 10 was issued and resolved
- Staff completed Chapter 10 review and issued an advanced safety evaluation to support today's ACRS Subcommittee meeting

NuScale SDAA FSAR Chapter 10 Review

Contributors

- **Technical Reviewers**
  - Angelo Stubbs, Lead, NRR/DSS/SCPB
  - Greg Makar, NRR/NRLB/NCSG
  - John Honcharik, NRR/NRLB/NPHP

- **Project Managers**
  - Thomas Hayden, PM, NRR/DNRL/NRLB
  - Getachew Tesfaye, Lead PM, NRR/DNRL/NRLB

NuScale SDAA FSAR Chapter 10 Review

Significant Changes and Impact

Design Turbine Power increase from 50 to 77 MW

- Larger Turbine Generator
- A new secondary side heat balance at the new power level.
- SSCs resized for higher flow associated with uprate
- Revised processed steam conditions on which plant safety analysis is based.

Air Cooled Condenser

- Atmosphere is now the Normal Heat Sink
- Effluents/releases from condenser have a more direct path to environment
- Remains capable of supporting 100 percent turbine bypass at increased power
- No turbine building flooding due to condenser failure.

Auxiliary Boiler Modifications

- Auxiliary Boiler No Longer used for Module Heatup
- High pressure boiler has been eliminated
- Fewer interfaces with potentially contaminated systems

Single Turbine Generator Building

- Single location from which turbine missile can be generated

Elimination of Circulating water system

- Air cooled condenser eliminated the need for Circ water system as normal heat sink
- Removed largest potential flooding source, expansion joint failure, from turbine generator building

NuScale SDAA FSAR Chapter 10 Review

Review Considerations based on Design Features

- NuScale classified FSAR chapter 10 subsystems that makeup the Power Conversion Systems as non-safety-related
- NuScale assigned the SSCs credited for main steam and feedwater isolation to the containment system, however, since the SSCs are credited for system functions other than containment isolation the staff review of Chapter 10 for the MSS and FWS were performed consistent with the boundaries defined in NuScale DSRS 10.3, and 10.4.7, which included these SSCs
- The TG Building does not contain SSCs important to safety, however TGS failure may result in the ejection of turbine missiles that can potentially impact SSCs outside of the turbine building
- SSCs important to safety housed in reactor building, which is credited for providing barrier protection against turbine missiles, evaluated under Chapter 3
- Air Cooled Condenser and Condensate Collection Tank reviewed for design protecting against release to environment

NuScale SDAA FSAR Chapter 10 Review

Findings and Conclusion

Staff Findings

- **Increased Power** - Heat balance provides the relevant secondary side process conditions for SSC sizing and applicable analyses (transients , AOO)
- **Turbine Generator** - US460 SSCs important to safety have protection from turbine missiles based on reactor building barrier, evaluated in Chapter 3
- **Air Cooled condenser** - System design includes means to adequately monitor and control the releases of radioactive effluents to the atmosphere and contain the spread of contamination consistent with 10 CFR 20.1406

Conclusion

- Power Conversion Systems described in Chapter 10 of the FSAR found in compliance with applicable regulations

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CHAPTER 11, "RADIOACTIVE WASTE MANAGEMENT"

March 19, 2024

(Open Session)

NuScale SDAA FSAR Chapter 11

- NuScale submitted Chapter 11, “Radioactive Waste Management,” Revision 0 of the NuScale SDAA FSAR on December 30, 2022, and Revision 1 on October 31, 2023.
- NRC performed a regulatory audit as part of its review of Chapter 11, from March 2023 to August 2023.
- NuScale submitted 12 pieces of supplemental information to address questions raised during the audit.
- No formal RAIs were issued for Chapter 11 review.
- The staff completed the review of Chapter 11 and issued an advanced safety evaluation to support today's ACRS Subcommittee meeting.

NuScale SDAA FSAR Chapter 11 Review

Contributors

- **Technical Reviewers**
  - Edward Stutzcage, Lead, NRR/DRA/ARCB
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- **Project Managers**
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NuScale SDAA FSAR Chapter 11 Review

- Section 11.1 - Source Terms
- Section 11.2 - Liquid Waste Management System
- Section 11.3 - Gaseous Waste Management System
- Section 11.4 - Solid Waste Management System
- Section 11.5 - Process and Effluent Radiation Monitoring Instrumentation and Sampling System
- Section 11.6 - Instrumentation and Control Design Features for Process and Effluent Radiological Monitoring, and Area Radiation and Airborne Radioactivity Monitoring

NuScale SDAA FSAR Chapter 11 Review

Highlights:

- The methodology for calculating Chapter 11 source terms in the SDAA is similar to that in the DCA, however, source terms and dose calculations changed due to the design changes.
- The radwaste management systems are mostly similar in the DCA and SDAA.
- Process and Effluent radiation monitors and sampling points are located 1) at potential release points; 2) to detect primary leakage; and 3) to detect high radiation or unexpected radiation in plant systems, ventilation systems, and areas in both the DCA and SDAA (locations are mostly similar and adequate between both designs).

NuScale SDAA FSAR Chapter 11 Review

Significant Differences between NuScale DCA FSAR Chapter 11 (Rev. 5) and NuScale SDAA FSAR Chapter 11 (Rev. 1):

- Section 11.1 - Source Terms
  - While the methodology for calculating the Chapter 11 source terms is essentially unchanged, the source terms and doses throughout Chapter 11 are all different than in the DCA due to changes in reactor power, number of units, and other factors. The staff audited the applicant's source term calculations and performed confirmatory calculations of source terms and doses from effluent releases and found them acceptable.

NuScale SDAA FSAR Chapter 11 Review

Significant Differences between NuScale DCA FSAR Chapter 11 (Rev. 5) and NuScale SDAA FSAR Chapter 11 (Rev. 1):

- Section 11.2 - Liquid Waste Management System
  - The Radioactive Waste Building was designed fully to RG 1.143, RW-IIa classification in the DCA. In the SDAA, the below grade portions of the Radioactive Waste Building and above grade portions designated for storage or processing of radioactive waste are RW-IIa and the remaining is Seismic Category III. The staff found the approach for classifying the Radioactive Waste Building consistent with RG 1.143 and to be acceptable.

NuScale SDAA FSAR Chapter 11 Review

Significant Differences between NuScale DCA FSAR Chapter 11 (Rev. 5) and NuScale SDAA FSAR Chapter 11 (Rev. 1):

- Section 11.2 - Liquid Waste Management System (continued)
  - The DCA included a COL item for mobile liquid waste processing equipment which is not included in the SDAA. The staff reviewed the liquid waste processing system provided in the SDAA and determined that adequate liquid waste processing capacity is provided in the design. Therefore, a COL item for mobile equipment was not required in the SDAA.

NuScale SDAA FSAR Chapter 11 Review

Significant Differences between NuScale DCA FSAR Chapter 11 (Rev. 5) and NuScale SDAA FSAR Chapter 11 (Rev. 1):

- Section 11.2 - Liquid Waste Management System (continued)
  - In the SDAA, NuScale revised Section 11.2 to not include C-14 in the liquid effluent discharges and dose calculations. The minimum discharge flow rate to meet 10 CFR 20, Appendix B, and minimum dilution flow rate to meet 10 CFR 50, Appendix I, were impacted by this change. The assumption of not considering C-14 in liquid effluent releases is consistent with RG 1.21 and NUREG-0017 and is acceptable. The staff audited the applicant's revised calculations and performed independent confirmatory calculations and found the changes to be acceptable.

NuScale SDAA FSAR Chapter 11 Review

Significant Differences between NuScale DCA FSAR Chapter 11 (Rev. 5) and NuScale SDAA FSAR Chapter 11 (Rev. 1):

- Section 11.3 - Gaseous Waste Management System
  - There are no significant differences between NuScale DCA Section 11.3 and SDAA FSAR Section 11.3
  - SDAA SE conclusion is the same as DCA SE conclusion for Section 11.3

NuScale SDAA FSAR Chapter 11 Review

Significant Differences between NuScale DCA FSAR Chapter 11 (Rev. 5) and NuScale SDAA FSAR Chapter 11 (Rev. 1):

- Section 11.4 - Solid Waste Management System
  - The DCA included discussions of mobile waste processing equipment. The staff reviewed the solid waste processing capabilities provided in the SDAA and determined that adequate solid waste processing capacity and adequate waste storage areas are provided in the design. Therefore, the SDAA design is acceptable without including information on potential mobile waste processing equipment. Information on mobile waste processing equipment is expected to be removed in SDAA Rev. 2.

NuScale SDAA FSAR Chapter 11 Review

Significant Differences between NuScale DCA FSAR Chapter 11 (Rev. 5) and NuScale SDAA FSAR Chapter 11 (Rev. 1):

- Section 11.5 - Process and Effluent Radiation Monitoring Instrumentation and Sampling System
  - There are no significant differences between NuScale DCA Section 11.5 and SDAA FSAR Section 11.5
  - SDAA SE conclusion is the same as DCA SE conclusion for Section 11.5

NuScale SDAA FSAR Chapter 11 Review

Significant Differences between NuScale DCA FSAR Chapter 11 (Rev. 5) and NuScale SDAA FSAR Chapter 11 (Rev. 1):

- Section 11.6 - Instrumentation and Control Design Features for Process and Effluent Radiological Monitoring, and Area Radiation and Airborne Radioactivity Monitoring
  - There are no significant differences between NuScale DCA Section 11.6 and SDAA FSAR Section 11.6
  - SDAA SE conclusion is the same as DCA SE conclusion for Section 11.6

NuScale SDAA FSAR Chapter 11 Review

Conclusion

- While there are some differences between the DCA and SDAA, the staff found that the applicant provided adequate source terms, dose calculations, radwaste system design, process and effluent radiation monitors, and radiation sample points in both designs.
- The staff found that all applicable regulatory requirements were adequately addressed.

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CHAPTER 2, "SITE CHARACTERISTICS AND SITE PARAMETERS"

March 19, 2024

(Open Session)

NuScale SDAA FSAR Chapter 2 Review

- NuScale submitted Chapter 2, “Site Characteristics and Site Parameters,” Revision 1, of the NuScale SDAA FSAR on October 31, 2023.
- NRC performed a regulatory audit as part of its review of Chapter 2, from March 2023 to August 2023.
- Questions raised during the audit were resolved within the audit. No RAIs were issued.
- The staff completed the review of Chapter 2 and issued an advanced safety evaluation to support the ACRS Subcommittee meeting.

NuScale SDAA FSAR Chapter 2 Review

Contributors

- **Technical Reviewers**
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- **Project Managers**
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NuScale SDAA FSAR Chapter 2 Review

- Section 2.0 – Site Characteristics and Site Parameters
- Section 2.1 – Geography and Demography
- Section 2.2 – Nearby Industrial, Transportation, and Military Facilities
- Section 2.3 – Meteorology
- Section 2.4 – Hydrologic Engineering
- Section 2.5 – Geology, Seismology, and Seismic Information

NuScale SDAA FSAR Chapter 2 Review

NuScale DCA FSAR Chapter 2 (Rev. 5) vs SDAA FSAR Chapter 2 (Rev. 1):

- Sections 2.0 Site Characteristics and Site Parameters
  - There are no significant differences between NuScale DCA FSAR and SDAA FSAR.
  - NuScale provided site parameters that are representative of potential locations in the United States. Table 2.0-1 provides a summary of these parameters.
  - NuScale provided COL Items related to this area of review.
  - The SDAA SE conclusion is the same as DCA SE conclusion.

NuScale SDAA FSAR Chapter 2 Review

NuScale DCA FSAR Chapter 2 (Rev. 5) vs SDAA FSAR Chapter 2 (Rev. 1):

- Sections 2.1 Geography and Demography
  - There are no significant differences between NuScale DCA FSAR and SDAA FSAR.
  - NuScale provided the Exclusion Area Boundary and Low Population Zone outer boundary.
  - NuScale provided COL Items related to this area of review.
  - SDAA SE conclusion is the same as DCA SE conclusion.

NuScale SDAA FSAR Chapter 2 Review

NuScale DCA FSAR Chapter 2 (Rev. 5) vs SDAA FSAR Chapter 2 (Rev. 1):

- Sections 2.2 Nearby Industrial, Transportation, and Military Facilities
  - There are no significant differences between NuScale DCA FSAR and SDAA FSAR.
  - NuScale did not postulate any hazards from nearby industrial, transportation or military facilities.
  - NuScale provided COL Items related to this area of review.
  - SDAA SE conclusion is the same as DCA SE conclusion.

NuScale SDAA FSAR Chapter 2 Review

NuScale DCA FSAR Chapter 2 (Rev. 5) vs SDAA FSAR Chapter 2 (Rev. 1):

- Section 2.3 Meteorology
  - SDAA revised the design basis tornado wind speed, and associated characteristics to be more conservative than DCA.
  - SDAA revised onsite and offsite X/Q values. Supporting Met data and methodology the same; distances revised.
  - NuScale provided COL Items related to this area of review.
  - The SDAA SE conclusion is the same as DCA SE conclusion.

NuScale SDAA FSAR Chapter 2 Review

NuScale DCA FSAR Chapter 2 (Rev. 5) vs SDAA FSAR Chapter 2 (Rev. 1):

- Sections 2.4.1 – 2.4.14 (Hydrology)
  - There are no significant differences between NuScale DCA FSAR and SDAA FSAR.
  - NuScale provided the COL Items needed for the hydrologic characteristics of a site referencing the standard design.
  - SDAA SE conclusion is the same as DCA SE conclusion.

NuScale SDAA FSAR Chapter 2 Review

NuScale DCA FSAR Chapter 2 (Rev. 5) vs SDAA FSAR Chapter 2 (Rev. 1):

- 2.5.1: Basic Geologic & 2.5.2: Seismic Information & 2.5.3: Surface Deformation:
  - There are no significant differences between NuScale DCA FSAR and SDAA FSAR.
  - NuScale provided the COL Items needed for the geology, seismology and geotechnical characteristics of a site referencing the standard design.
  - SDAA SE conclusion is the same as DCA SE conclusion.

NuScale SDAA FSAR Chapter 2 Review

NuScale DCA FSAR Chapter 2 (Rev. 5) vs SDAA FSAR Chapter 2 (Rev. 1):

- 2.5.4 & 2.5.5: Geotechnical Engineering:
  - There are no significant differences between NuScale DCA FSAR and SDAA FSAR.
  - NuScale provided the necessary site parameters and COL Items needed for foundation stability design and analyses, and slope stability evaluations.
  - SDAA SE conclusion is the same as DCA SE conclusion.

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CHAPTER 13, "CONDUCT OF OPERATIONS"

March 19, 2024

(Open Session)

NuScale SDAA FSAR Chapter 13 Review

- NuScale submitted Chapter 13, “Conduct of Operations,” Revision 1, of the NuScale SDAA FSAR on October 31, 2023.
- NRC performed a regulatory audit as part of its review of Chapter 13, from March 2023 to August 2023.
- NuScale submitted 5 pieces of supplemental information to address questions raised during the audit.
- 1 RAI, regarding 13.3, was submitted for review
- The staff completed the review of Chapter 13 and issued an advanced safety evaluation to support today's ACRS Subcommittee meeting.

NuScale SDAA FSAR Chapter 13 Review

Contributors

- **Technical Reviewers**
  - Kamishan Martin, NRR/DRO/IOLB (13.1, 13.2, 13.5)
  - Kenneth Mott, NSIR/DPR/RLB (13.3)
  - Ricky Vivanco, NRR/DNRL/NRLB (13.4)
  - Paul Harris (since retired), Brian Zaleski, NSIR/DPCP/RSB (13.7)
- **Project Managers**
  - Ricky Vivanco, PM, NRR/DNRL/NRLB
  - Getachew Tesfaye, Lead PM, NRR/DNRL/NRLB

NuScale SDAA FSAR Chapter 13 Review

- Section 13.1 – Organizational Structure
- Section 13.2 – Training
- Section 13.3 – Emergency Planning
- Section 13.4 – Operational Programs
- Section 13.5 – Plant Procedures
- Section 13.6 – Physical Security
- Section 13.7 – Fitness for Duty

NuScale SDAA FSAR Chapter 13.1 Review

- No significant changes to 13.1 from DCA to SDA
- The staff's finding is consistent.

NuScale SDAA FSAR Chapter 13.2 Review

- No significant changes to 13.2 from DCA to SDA
- The staff's finding is consistent.

NuScale SDAA FSAR Chapter 13.3 Review

Significant Differences between NuScale DCA FSAR Chapter 13.3 (Rev. 5) and SDAA FSAR Chapter 13.3 (Rev. 1):

- COL Items for the OSC and EOF removed in the SDAA FSAR. COL item in SDAA is broad to include all ERFs
  - NRC staff finds that the SDAA COL Item requiring the applicant to address the requirements for any/all required ERFs provides for a more streamlined application and provides flexibility for a future COL applicant that may not be required to provide the specified DCA FSAR ERFs.
- DCA FSAR listed TSC room and additional space size specifications removed in SDAA FSAR.
- The TSC design criteria of NUREG-0696, "Functional Criteria for Emergency Response Facilities," does not specify a square footage size for rooms/additional spaces. The guidance specifies 75 sq ft/person of uncrowded working space for a minimum of 25 TSC personnel (20 licensee, 5 NRC).
- The DCA FSAR list the TSC as a Seismic Category I structure. The SDAA FSAR list the TSC as a Seismic Category II structure.
  - The NUREG-0696 TSC design guidance does not require the TSC to meet Seismic Category I criteria or be qualified as an engineered safety feature (ESF).
- **SDAA SE conclusions are the same as from the DCA.**

NuScale SDAA FSAR Chapter 13.4 Review

Significant Differences between NuScale DCA FSAR Chapter 13.4 (Rev. 5) and NuScale SDAA FSAR Chapter 13.4 (Rev. 1):

- Removal of the Motor Operated Valve (MOV) testing program
  - US460 design does not contain safety-related MOVs (3.9.6.3)
- Removal of the Reactor Vessel Material Surveillance Program
  - FSAR Section 5.3.1.6 is under review for exemption from 10 CFR 50.60 and 10 CFR 50, Appendix H.
- The staff concludes that applicable programs are listed in COL item 13.4-1

NuScale SDAA FSAR Chapter 13.5 Review

Significant Differences between NuScale DCA FSAR Chapter 13.5 (Rev. 5) and NuScale SDAA FSAR Chapter 13.5 (Rev. 1):

- Removal of the discussion of Generic Technical Guidelines.
  - The staff did not make a finding on GTGs in the DCA nor did it impact their conclusion.
  - **SDAA SE conclusions are consistent to those from the DCA.**

NuScale SDAA FSAR Chapter 13.7 Review

Significant Differences between NuScale DCA FSAR Chapter 13.7 (Rev. 5) and NuScale SDAA FSAR Chapter 13.7 (Rev. 1):

- Removal of the COL item from the DCA for a COL applicant to include a description of a Fitness for Duty (FFD) program
  - 10 CFR 26.401 requires an entity who intends to implement an FFD program under Subpart K of Part 26, "FFD Programs for Construction," to submit a description of the FFD program and its implementation as part of the license, permit, or limited work authorization application. A COL item in this SDA is not required.

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CHAPTER 17, "QUALITY ASSURANCE AND RELIABILITY ASSURANCE" (SECTIONS 17.1 – 17.3, 17.5, 17.6)

March 19, 2024

(Open Session)

NuScale SDAA FSAR Chapter 17 (minus 17.4) Review

- NuScale submitted Chapter 17, “Quality Assurance and Reliability Assurance,” Revision 1, of the NuScale SDAA FSAR on October 31, 2023.
- NRC performed a regulatory audit as part of its review of Chapter 17, from March 2023 to August 2023.
- No Audit Questions or RAIs were issued.
- The staff completed the review of Chapter 17 and issued an advanced safety evaluation to support the ACRS Subcommittee meeting.

NuScale SDAA FSAR Chapter 17 (minus 17.4) Review

Contributors

- **Reviewer**
  - Frankie Vega, NRR/DRO/IQVB
- **Project Managers**
  - Prosanta Chowdhury, PM, NRR/DNRL/RLB
  - Getachew Tesfaye, Lead PM, NRR/DNRL/RLB

NuScale SDAA FSAR Chapter 17 (minus 17.4) Review

- **Section 17.1 – Quality Assurance during the Design Phase**
- **Section 17.2 – Quality Assurance during the Construction and Operations Phases**
- **Section 17.3 – Quality Assurance Program Description**
- **Section 17.4 – Reliability Assurance Program (reviewed as a "high effort" section; will be presented seperately)**
- **Section 17.5 – Quality Assurance Program Description—Design Certification, Early Site Permits, and New License Applicants**
- **Section 17.6 – Maintenance Rule**

NuScale SDAA FSAR Chapter 17 (minus 17.4) Review

NuScale DCA FSAR Chapter 17 (Rev. 5) vs SDAA FSAR Chapter 17 (Rev. 1):

- There are no significant differences between NuScale DCA FSAR Chapter 17 and SDAA FSAR Chapter 17
- Both the SDAA and DCA FSAR Chapter 17 referenced approved versions of NuScale's QAPDs
  - **DCA FSAR Chapter 17 (Rev. 5) -** references Topical Report: Quality Assurance Program Description for the NuScale Power Plant," NP-TR-1010-859-N
  - **SDAA FSAR Chapter 17 (Rev. 1) -** references Topical Report (LTR) MN-122626-A, Revision 1, "NuScale Power, LLC Quality Assurance Program Description
- SDAA SE conclusion is the same as DCA SE conclusion

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Sandra Walker	Joined	3/19/24, 9:27:48 AM
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John Honcharik	Joined	3/19/24, 9:53:11 AM
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Wendy Reid (NuScale)	Joined	3/19/24, 9:54:01 AM
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Jenise Thompson	Joined	3/19/24, 9:58:45 AM
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Rnayal	Joined	3/19/24, 10:26:48 AM
Tim Polich	Joined	3/19/24, 10:29:23 AM
Kenneth See	Joined	3/19/24, 10:30:27 AM
Stacy Joseph	Joined	3/19/24, 10:34:49 AM
Christina Antonescu	Joined	3/19/24, 10:35:01 AM
Weidong Wang	Joined	3/19/24, 10:38:02 AM
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