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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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722ND MEETING

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

+ + + + +

THURSDAY

FEBRUARY 6, 2025

+ + + + +

The Advisory Committee met via  
Video/Teleconference, at 8:30 a.m. EST, Walter L.  
Kirchner, Chair, presiding.

COMMITTEE MEMBERS:

- WALTER L. KIRCHNER, Chair
- GREGORY H. HALNON, Vice Chair
- DAVID A. PETTI, Member-at-Large
- RONALD G. BALLINGER, Member
- VICKI M. BIER, Member
- VESNA B. DIMITRIJEVIC, Member
- CRAIG D. HARRINGTON, Member
- ROBERT P. MARTIN, Member
- SCOTT P. PALMTAG, Member
- THOMAS E. ROBERTS, Member
- MATTHEW W. SUNSERI, Member

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ACRS CONSULTANTS :

STEPHEN P. SCHULTZ

DENNIS C. BLEY

DESIGNATED FEDERAL OFFICIALS :

QUYNH NGUYEN

LAWRENCE BURKHART

MICHAEL SNODDERLY

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

8:31 a.m.

CHAIR KIRCHNER: Good morning. The meeting will now come to order. This is the second day of the 722nd meeting of the Advisory Committee on Reactor Safeguards, ACRS. I'm Walt Kirchner, Chairman of the ACRS.

ACRS members in attendance in person are Ron Ballinger, Greg Halnon, Craig Harrington, Robert Martin, Scott Palmtag, and David Petti. Members attending virtually are Vicki Bier, Thomas Roberts, and Matt Sunseri and Vesna Dimitrijevic. We also have in-person presence of our consultant Stephen Schultz, and I expect that --

VICE CHAIR HALNON: Dennis is on.

CHAIR KIRCHNER: Our consultant Dennis Bley is on virtually. Excellent. If I missed anyone, please speak up.

Not hearing anything, Michael Snodderly of the ACRS staff is the Designated Federal Officer for this morning's full Committee meeting. No member conflicts of interest were identified. And I know that we have a quorum.

The ACRS was established by statute and is governed by the Federal Advisory Committee Act, or

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1 FACA. The NRC implements FACA in accordance with our  
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3 Committee's bylaws, the ACRS speaks only through its  
4 published letter reports. All member comments should  
5 be regarded as only the individual opinion of that  
6 member and not a Committee position.

7 All relevant information related to ACRS  
8 activities, such as letters, rules for meeting  
9 participation, and transcripts are located on the NRC  
10 public website and can be easily found by typing About  
11 Us ACRS in the search field on NRC's home page.

12 The ACRS, consistent with the Agency's  
13 value of public transparency in regulation of nuclear  
14 facilities, provides opportunity for public input and  
15 comment during our proceedings. We have received no  
16 written statements or requests to make an oral  
17 statement from the public. However, written  
18 statements may be forwarded to today's Designated  
19 Federal Officer. We have also set aside time at the  
20 end of this meeting for public comments.

21 A transcript of the meeting is being kept  
22 and will be posted on our website. When addressing  
23 the Committee, the participants should first identify  
24 themselves and speak with sufficient clarity and  
25 volume so that they may be readily heard. If you're

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11 presenters, your table microphones are unidirectional,  
12 and you'll need to speak into the front of the  
13 microphone to be heard online. Finally, if you have  
14 any feedback for the ACRS about today's meeting, we  
15 encourage you to fill out the public meeting feedback  
16 form on the NRC's website.

17 During this morning's meeting, the  
18 Committee will consider the following topics. First  
19 up will be NuScale loss of coolant accident evaluation  
20 model topical report, and then we'll continue our  
21 deliberations on two letter reports, one for Reg Guide  
22 3.78 and the other on the increased enrichment  
23 rulemaking.

24 And with that, since I am the Subcommittee  
25 Chair for NuScale, I'm going to turn to Bob Martin,

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1 who is the lead on the Committee's review of the LOCA  
2 evaluation model or topical report. So, with that,  
3 I'll turn to Bob Martin.

4 MEMBER MARTIN: All right. Thanks, Paul.  
5 Of course, I have a prepared summary that's been put  
6 together here in the last few weeks for the conclusion  
7 of our engagement with NuScale. I will begin by  
8 referring to myself in third person, so I don't want  
9 anyone to get confused or find otherwise awkward. But  
10 here it goes.

11 Member Martin reviewed NuScale's topical  
12 report, TR-0516-49422, Loss-of-Coolant Accident  
13 Evaluation Model Revision 3, detailing the design  
14 basis LOCA evaluation, which is used to analyze  
15 emergency core cooling system performance in the  
16 water-cooled 250-megawatt thermal NuScale power module  
17 for NMP-20.

18 A March 25, 2020, Committee letter  
19 concluded that a previous revision of this TR -- the  
20 staff-imposed limitations and conditions provided an  
21 acceptable methodology for analyzing early-stage LOCAs  
22 and NuScale's 160-megawatt thermal NPM-160 and the  
23 NPM-20 LOCA, resulting from either an inadvertent  
24 opening of an RPV valve or pipe breaks. Inside  
25 containment begins with a reactor coolant system

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1 breach that releases coolant into the surrounding  
2 containment vessel. For the module protection system,  
3 or MPS, activates emergency core cooling system by  
4 opening reactor vent and recirculation valves,  
5 commonly referred to as RVVs or RRVs, maintaining  
6 coolant inventory well above the active core region.

7 On January 15th, 2025, three weeks ago,  
8 NuScale and NRC staff presented the TR's merits to the  
9 Committee for LOCA analysis supporting ECCS  
10 assessments, in alignment with Regulatory Guide 1.203,  
11 10 CFR 50, Appendix K, and general design criteria 35,  
12 or GDC 35, which relates to ECC --

13 The presentations addressed features of  
14 NuScale's LOCA EM for estimated collapse liquid level  
15 above the fuel and minimum critical heat flux ratio,  
16 as impacted by design changes between NPM-160 and NPM-  
17 20. Additionally, the revised TR now includes a  
18 containment vessel pressure and temperature response  
19 analysis, adhering to GDC 16, 38, and 50, addressing  
20 its ability to ensure structural integrity and leak  
21 tightness, accommodate energy releases, and manage  
22 heat removal and withstand dynamic effects and  
23 environmental conditions during LOCAs.

24 The NPM-20 preserves a module's basic  
25 design with adjusted operating conditions, including

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1 increased primary pressure, T av control replacing T  
2 hot control, a reduced feedwater temperature, and a  
3 lower minimum critical temperature.

4 Containment design parameters were  
5 enhanced with design pressure and temperature  
6 increased to 1,200 PSI and 600 F respectively. ECCS  
7 valves, i.e., the RVVs and RRVs, have been redesigned  
8 to ensure reliable depressurization capability via  
9 resizing and the addition of trip valves and low  
10 venturis. The RVVs no longer include the inadvertent  
11 actuation block valves.

12 NuScale and NRC staff presented the  
13 incremental impact of these design changes on LOCA EM.  
14 Design changes had little effect on NuScale's local  
15 phenomena identification and ranking table, i.e.,  
16 PIRT. We did require updates to their NRELAP5 thermal  
17 hydraulic systems code, an additional validation  
18 assessment from their NIST-2 test facility. Those  
19 changes were limited to those necessary for general  
20 maintenance and to address NPM-160 to NPM-20  
21 differences, including an improved CH --

22 The NPM-20 NRELAP5 model also employs  
23 features beyond 20 CFR 50, Appendix K, to  
24 conservatively calculate figures of merit.

25 The Committee concludes that while the TR

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1 introduces several EM changes to accommodate the NPM-  
2 20 design, it remains sufficiently complete and  
3 accurate for verifying the adequacy of the ECCS  
4 performance for the updated design during design-bases  
5 LOCAs.

6 This conclusion is supported by the  
7 following: one, the design changes are incremental  
8 and aligned with power uprate; two, EM builds from a  
9 previously approved methodology; and three, EM  
10 addresses major process and phenomenological  
11 uncertainties and retains the conservative features  
12 required by 10 CFR 50, Appendix K, as applicable to  
13 the NPM-20 implying a subset of the -- of what  
14 otherwise appears in Appendix K. Furthermore, the  
15 staff's L&Cs, limitations and conditions, most of  
16 which are carried forward from prior EM, remain  
17 relevant and appropriate.

18 Member Martin recommends that the  
19 Committee not object to the staff issuing the safety  
20 evaluation report on the revised topical report. It  
21 is also recommended that this write-up serve as the  
22 record of the Subcommittee meeting and an ACRS letter  
23 report not be prepared.

24 I might add that the proceedings that  
25 we've had benefitted from some engagement with the

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1 applicant to highlight what we thought was  
2 particularly important from a safety perspective. And  
3 certainly, as the lead on this, I really appreciated  
4 that engagement --

5 CHAIR KIRCHNER: Members' comments?

6 I have one, Bob, and that is -- you say it  
7 later on. The figures of merit are keeping the  
8 collapse liquid level of the active core, and the  
9 other one is damage the minimum critical heat flux  
10 ratio. You do point those figures of merit out later.  
11 Could we just move that up to that first paragraph and  
12 point out that those are the metrics?

13 MEMBER MARTIN: Oh, yeah. I have no  
14 problem editing this. I can get that to Larry -- I  
15 mean, this will be a piece for discussion tomorrow.  
16 I don't think we'll reread it tomorrow. But we can  
17 make the edit that you're suggesting here.

18 CHAIR KIRCHNER: Yeah.

19 MEMBER MARTIN: Yeah.

20 CHAIR KIRCHNER: Thank you for that.

21 If there are no further comments, then we  
22 will --

23 MEMBER SUNSERI: Hey, this is Matt. I  
24 have just a question for him.

25 CHAIR KIRCHNER: Yeah, go ahead, Matt.

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1 MEMBER SUNSERI: So, I mean, why are we  
2 doing this this way versus the memo format that we do  
3 for other chapters? I'm just curious.

4 MEMBER MARTIN: This is not a chapter.  
5 This is actually a TR. So we will have a chapter --  
6 is it April that we'll have a meeting on the Chapter  
7 15? So yes. There will be a memo.

8 MEMBER SUNSERI: Okay.

9 MEMBER MARTIN: On this -- this was Matt,  
10 in lieu -- because we had a placeholder in our -- we  
11 set the agenda, because of the FRN requirements, a  
12 month in advance. So we put a placeholder on the  
13 agenda for this morning in case we might decide -- the  
14 Committee might decide to write a letter report.

15 The recommendation from the Subcommittee  
16 was not to, unless the Committee members present this  
17 morning wish otherwise. Please advance that opinion.  
18 Otherwise, we will just do as we indicated, P&P to  
19 make this part of the summary meeting record.

20 MEMBER SUNSERI: Thank you.

21 MEMBER ROBERTS: Yeah, this is Tom. To  
22 answer Matt's question, I think the distinction is if  
23 the staff intends to approve the topical report in  
24 advance of the application, then they would need to  
25 have this kind of write-up from us to document that we

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1 don't object to issuing the topical. So I don't know  
2 if the intent is to issue this topical in advance of  
3 the FSER approval, but if it is, then I think that  
4 would be a reason to have the separate memo.

5 CHAIR KIRCHNER: Any further discussion?

6 Okay. Thank you, Bob.

7 With that, I would like to suggest that we  
8 move on to our letter report for Reg Guide 3.78.

9 Tammy, are you able to pull that most  
10 recent version -- Reg 3, I think, is the latest  
11 version -- Reg 4. Sorry.

12 MR. BURKHART: Yes -- and this is Larry  
13 Burkhart. I believe we don't need the court reporter  
14 anymore. Toby, we don't need you for the rest of the  
15 day, nor the rest of this meeting.

16 CHAIR KIRCHNER: That's correct. Yeah.

17 MR. BURKHART: Thank you, Toby.

18 CHAIR KIRCHNER: Yes. Thank you for your  
19 service.

20 (Whereupon, the above-entitled matter went  
21 off the record at 8:45 a.m.)

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