



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001**

January 8, 2019

MEMORANDUM TO: ACRS Members

FROM: Derek A. Widmayer, Senior Staff Scientist **/RA/**
 Technical Support Branch
 Advisory Committee on Reactor Safeguards

SUBJECT: CERTIFICATION OF THE MINUTES OF THE JOINT ACRS
 FUTURE PLANT DESIGN AND REGULATORY POLICIES
 AND PRACTICES SUBCOMMITTEES MEETING, AUGUST 22,
 2018, IN ROCKVILLE, MARYLAND

The minutes for the subject meetings were certified on December 21, 2018. Along with the transcripts and presentation materials, this is the official record of the proceedings of those meetings. A copy of the certified minutes is attached.

Attachments: As stated

cc with Attachments: A. Veil
 M. Banks



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001**

MEMORANDUM TO: Derek A. Widmayer, Senior Staff Scientist
 Technical Support Branch
 Advisory Committee on Reactor Safeguards

FROM: Dennis J. Bley, Chairman
 Future Plant Designs Subcommittee

SUBJECT: CERTIFICATION OF THE MINUTES OF THE JOINT ACRS
 FUTURE PLANT DESIGNS SUBCOMMITTEE AND REGULATORY
 POLICIES AND PRACTICES SUBCOMMITTEE MEETING ON
 AUGUST 22, 2018, IN ROCKVILLE, MARYLAND

I hereby certify, to the best of my knowledge and belief, that the minutes of the subject meetings on August 22, 2018, are an accurate record of the proceedings for that meeting.

/RA/

December 21, 2018

Dennis Bley, Chairman
Future Plant Design
Subcommittee

Dated

**ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
JOINT REGULATORY POLICIES AND PRACTICES AND
FUTURE PLANT DESIGNS SUBCOMMITTEE
MEETING MINUTES
August 22, 2018
Rockville, MD**

The Advisory Committee on Reactor Safeguards (ACRS) Subcommittees on Regulatory Policies and Practices and Future Plant Designs met on August 22, 2018, at 11545 Rockville Pike, Rockville, MD, in Room T2-B1. The meeting was convened at 8:30 am and adjourned at 11:44 am.

The meeting was open to the public. Mr. Derek A. Widmayer was the cognizant ACRS staff scientist and Designated Federal Official for the meeting. There were several requests for time to make oral statements and written comments were received from the public concerning the meeting. The comments are included with the transcript of the meeting which is attached.

ATTENDEES

ACRS

D. Bley, Chairman, Future Plant Designs Subcommittee	
G. Skillman, Member	P. Riccardella, Member *
J. March-Leuba, Member	J. Rempe, Member
M. Sunseri, Member	R. Ballinger, Member
M. Corradini, Member	W. Kirchner, Member
C. Brown, Member	D. Widmayer, ACRS Staff

NRC Staff

P. Holahan, NMSS/DRM/	N. Valliere, COMM/OCMSB
A. Carrera, NMSS/DRM/MRPB	F. Schofer, NMSS/DRM/RASB
C. Howells, NMSS/DRM/RASB	J. O'Driscoll, NMSS/DRM/
J. Jolicoeur, OEDO	S. Lynch, NRR/DLP/PRLB
D. Andrukat, NMSS/DRM/RRPB	E. Bowman, NRR/DLP/PBMB
H. Benowitz, OGC	A. Bradford, NRO/DLSE
A. Fetter, NRO/DLSE	D. Palmrose, NRO/DLSE/RPAC
M. Hart, NRO/DLSE/RPAC	M. Sutton, NRO/DLSE/LB3
P. Chowdhury, NRO/DLSE/LB1	M. Stutzke, NRO/DSRA
J. Segala, NRO/DSRA/ARPB	K. Thomas, NSIR/DPR/POB
D. Barss, NSIR/DPR/RLB	B. Musico, NSIR/DPR/RLB
M. Abramovitz, NSIR/DPR	T. Smith, NSIR/DPR/POB
J. Fiske, NSIR/DPR/POB	P. Milligan, NSIR/DPR
A. Marshall, NSIR/DPR/RLB	J. Anderson, NSIR/DPR/RLB
E. Roach, NSIR/DPR	A. Hathaway, RES/DSA/AAB
B. Thomas, RES/DE	K. Compton, RES/DSA/AAB
M. Bayssie, RES/DE/RGGIB	

Others

S. Shahrocki, Framatome, Inc.
B. Waites, Southern Nuclear
B. Johnson, TerraPower
A. Afzali, Southern Company
A. Young, TVA
K. Schmidt, TVA
J. Reyes, NuScale Power
S. Weber, NuScale Power
W. Lee, TVA
A. Campbell, ICF
R. Bell, NEI
J. Thomas, TVA

S. Mirsky, NuScale Power
D. Gardner, Kairos Power
D. Young, NEI
M. Tschiltz, NEI
A. Monohsian, TVA
W. Eberst, FEMA
D. Daigle, Enercon
K. Deyette, NuScale Power
L. Gormsen, ICF
G. McHenry, ICF
D. Stout, TVA

* Participated by telephone

SUMMARY

The purpose of this Subcommittee meeting was to review and discuss the Draft Proposed Rule, “***Emergency Preparedness for Small Modular Reactors and Other New Technologies***,” and the associated **Draft Regulatory Guide DG-1350**.

<i>SIGNIFICANT ISSUES</i>	<i>Reference Transcript Pages</i>
Chairman Bley called the meeting to order and provided the opening remarks.	5 – 8
Dr. P. Holahan, Director of the Division of Rulemaking, NMSS, introduced the meeting, including the background on the rulemaking and process undertaken by the staff to produce the documents.	8 – 14
ACRS members addressed the following issues during this part of the meeting: <ul style="list-style-type: none"> • Where the applicability to light water reactors (LWRs) question that has been included in the rulemaking originated. (Bley) • That the staff should address source term and the differences between the requirements in the new rule and Part 50 Appendix E as the discussion progresses. (Bley) 	10 13 – 14

<p>K. Thomas, NSIR, presented the staff slides and discussion on the proposed draft rulemaking and guidance documents. He provided the background on the rulemaking, the requirements for existing nuclear power reactors and the basis for differences between these and the new small modular reactors (SMRs), and a brief summary of the regulatory basis document.</p>	<p>14 – 78 Slides 149 – 162</p>
<p>ACRS members addressed the following issues during this part of the meeting:</p>	
<ul style="list-style-type: none"> • That the staff should reconsider and include other new technologies (ONTs) in the scope of the rule. (Skillman) 	<p>16 – 17</p>
<ul style="list-style-type: none"> • The choice of 1000 MWt as the cutoff criteria in the rule, what its basis is, whether the basis is technical or based on other considerations, and how it will be applied to multiple-module facilities. (Kirchner, Corradini, Bley, Rempe) 	<p>18 – 25</p>
<ul style="list-style-type: none"> • Why multiple modules are not specifically called out in the rule, and why the 96-hour limitation is included. (Kirchner, Rempe) 	<p>28 – 32</p>
<ul style="list-style-type: none"> • Whether the source term for the emergency planning zone (EPZ) in the new rule is the same as the one to be used for siting for new applications. (Corradini) 	<p>33 – 35</p>
<ul style="list-style-type: none"> • Why the staff included the question in the FRN to ask about expanding the new rule to existing LWRs. (Bley, Kirchner) 	<p>38 – 40</p>
<ul style="list-style-type: none"> • Whether the two documents cited in the Draft Guide are publicly available. (Rempe) 	<p>43 – 44</p>
<ul style="list-style-type: none"> • How Emergency Action Levels (EALs) will be calculated for different scenarios. (Skillman) 	<p>44 – 49</p>
<ul style="list-style-type: none"> • Whether more source term guidance will be provided, particularly on major or guiding principles, to include cutoff frequency, and an appreciation for the difficulties that will be encountered in the calculations, when this might be done, and whether the Clinch River Early Site Permit review for its EPZ was a good example of what staff is expecting for a source term analysis. (Bley, Rempe, Kirchner) 	<p>49 – 60</p>
<ul style="list-style-type: none"> • Whether there has been a staff re-evaluation of the source term and methodology used in NUREG-0396, and whether the staff would point to that as guidance for an SMR applicant to use in lieu of new guidance on source term. (Corradini) 	<p>61 – 67</p>

<ul style="list-style-type: none"> The alignment of the emergency plan (EP) requirements in the new rule with §50.47 and Appendix E and what new guidance is added. (Bley) 	73 – 75
<p>P. Holahan and D. Taylor, provided some clarifying remarks concerning the purpose of the rulemaking and the relationship of the rule and guidance to other work where source term methodologies were being studied by NRC staff.</p> <p>ACRS members had no issues during this part of the meeting.</p>	79 – 81
<p>K. Thomas continued his presentation. He presented information on each of the specific new requirements in the draft proposed rule and the basis for each of the requirements.</p> <p>ACRS members addressed the following issues during this part of the meeting:</p> <ul style="list-style-type: none"> Clarifying what the site boundary includes. (Kirchner) How major changes in the area around the facility are addressed in the new rule for assessment for potential revisions in the EP and generally how the EP will be maintained. (Skillman, Bley) Whether Appendix E would be structured more like the new rule requirements if it were written today, and why. (Bley) That the EALs remain limited to radiological emergencies and not include security. (Skillman) Clarifying that the emergency response data system is required in another part of the regulations. (Skillman) That the description that the required hazard analysis must consider multiple modules is included in the statements of consideration, whether that makes them binding, and whether it should be included more specifically in a rule requirement. (Corradini, Bley, Skillman) Clarifying that the Licensing Modernization Project will address the need to ensure SMRs meet 10 CFR Part 20 requirements even if other bases are used to calculate licensing basis events. (Rempe) 	<p>81 – 121 Slides 163 – 181</p> <p>86</p> <p>88 – 93</p> <p>96 – 102</p> <p>103 – 105</p> <p>111 – 112</p> <p>113 – 117</p> <p>120 – 121</p>

<p>A. Carrera, the rulemaking Project Manager, NMSS, provided the proposed schedule of activities remaining on the rulemaking and then some concluding remarks.</p> <p>ACRS members had no issues during this part of the meeting.</p>	<p>121 – 126 Slide 182</p>
<p>Chairman Bley provided an opportunity for those requesting time to make comments at the meeting. The following individuals provided comments (written comments from these individuals are included with the transcript at the indicated page numbers):</p> <ul style="list-style-type: none"> • S. Shahrokhi, Framatome, Inc. (written comments included) • S. Mirsky, NuScale Power (written comments included) • B. Johnson, Terrapower (written comments included) • D. Gardner, Kairos Power (written comments included) • B. Waites, Southern Nuclear <p>Chairman Bley provided an opportunity for comments from the public from the meeting room and the teleconference line. The following individual provided comments.</p> <ul style="list-style-type: none"> • S. Fields 	<p>126 – 133</p> <p>126 144</p> <p>127 146</p> <p>130 147</p> <p>131 145</p> <p>132</p> <p>133 – 135</p> <p>134</p>
<p>The Subcommittee members discussed the presentations and provided summary comments on the issues and asked final questions about the matter.</p> <p>The following issues were discussed by ACRS members during this part of the meeting:</p> <ul style="list-style-type: none"> • That a truly risk-informed rule should be able to address multiple-modules, and that addressing future changes to the site/facility should be included. (Ricardella) • That the rule should explicitly address multiple-modules, that addressing future changes to the site/facility and more source term guidance should be included, the 96 hours should be clarified, and the two papers cited should be made public. (Rempe) 	<p>135 – 142</p> <p>135</p> <p>136</p>

<ul style="list-style-type: none"> Reiterating needs for improvement to guidance addressed by other members, and expressing support that good EP at nuclear power plants assists community to respond to other emergencies. (Sunseri) 	137
<ul style="list-style-type: none"> That the source term is the most important aspect of the rulemaking. (Skillman) 	141
Chairman Bley made some comments concerning the preparations for the October 2018 subcommittee meeting on this topic, and adjourned the meeting.	142

ACTION ITEMS	Reference Transcript Pages
<ul style="list-style-type: none"> That if staff made any revisions to the documents, that they should provide the revised versions to ACRS staff in time for the Full Committee session in October <i>(Completed)</i> 	142

ATTACHMENT

Official Transcript of Proceedings, Meeting of ACRS Future Plants Design Subcommittee, Wednesday, August 22, 2018, Rockville, MD. (ML18254A205)

Documents Provided to the Subcommittee:

1. Draft Federal Register Notice, NUCLEAR REGULATORY COMMISSION, 10 CFR Parts 50 and 52, [NRC-2015-0225], RIN 3150-AJ68, *"Emergency Preparedness for Small Modular Reactors and Other New Technologies."* (ML18213A278)
2. Draft Regulatory Guide (DG) 1350, *"Performance-Based Emergency Preparedness for Small Modular Reactors, Non-Light-Water Reactors, and Non-Power Production or Utilization Facilities."* (ML18213A284)
3. Draft SECY Paper, "PROPOSED RULE: EMERGENCY PREPAREDNESS FOR SMALL MODULAR REACTORS AND OTHER NEW TECHNOLOGIES (RIN 3150-AJ68)." (ML18213A269)
4. Regulatory Basis, *"Rulemaking for Emergency Preparedness for Small Modular Reactors and Other New Technologies, RIN Number: 3150-AJ68, NRC Docket ID: NRC-2015-0225,"* September 2017 (ML17206A265)

Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards
Future Plant Designs and Regulatory Policies
and Practices Subcommittees

Docket Number: (n/a)

Location: Rockville, Maryland

Date: Wednesday, August 22, 2018

Work Order No.: NRC-3859

Pages 1-142

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
(ACRS)
+ + + + +
FUTURE PLANT DESIGNS AND REGULATORY POLICIES AND
PRACTICES SUBCOMMITTEES
+ + + + +
WEDNESDAY
AUGUST 22, 2018
+ + + + +
ROCKVILLE, MARYLAND

+ + + + +
The Subcommittee met at the Nuclear
Regulatory Commission, Two White Flint North, Room
T2B1, 11545 Rockville Pike, at 8:30 a.m., Dennis C.
Bley, Chairman, presiding.

1 COMMITTEE MEMBERS:

2 DENNIS C. BLEY, Chairman

3 RONALD G. BALLINGER, Member

4 CHARLES H. BROWN, JR., Member

5 MICHAEL L. CORRADINI, Member

6 WALTER L. KIRCHNER, Member

7 JOSE A. MARCH-LEUBA, Member

8 JOY L. REMPE, Member

9 PETER C. RICCARDELLA, Member*

10 GORDON R. SKILLMAN, Member

11 MATTHEW W. SUNSERI, Member

12
13 DESIGNATED FEDERAL OFFICIAL:

14 DEREK A. WIDMAYER

1 ALSO PRESENT:

2 HOWARD BENOWITZ, OGC

3 ANNA BRADFORD, NRO

4 ANDREW CARRERA, NMSS

5 KEITH COMPTON, RES

6 ARLON COSTA, NRO

7 SARAH FIELDS*

8 DARRELL GARDNER, Kairos

9 MICHELLE HART, NRO

10 PATRICIA HOLAHAN, NMSS

11 BRIAN JOHNSON, TerraPower

12 STEVE LYNCH, NRR

13 PATRICIA MILLIGAN, NSIR

14 STEVEN MIRSKY, NuScale

15 ED ROACH, NSIR

16 JOHN SEGALA, NRO

17 FARSHID SHAHROKHI, Framatome

18 ROBERT TAYLOR, NSIR

19 KENNETH THOMAS, NSIR

20 BRANDON WAITES, Southern Nuclear

21 *Present via telephone

C O N T E N T S

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P R O C E E D I N G S

8:29 a.m.

→ CHAIRMAN BLEY: Good morning. The meeting will now come to order. This is a joint meeting of the Advisory Committee on Reactor Safeguards Subcommittees on Future Plant Designs and Regulatory Policies and Practices.

I'm Dennis Bley, Chairman of the Future Plants Design Subcommittee. ACRS members in attendance are Joy Rempe, Charlie Brown, Walt Kirchner, Jose March-Leuba, Dick Skillman, Mike Corradini, Matt Sunseri, and Ron Ballinger.

MEMBER REMPE: Charlie's kind of quiet today.

CHAIRMAN BLEY: And we have Charlie Brown with us momentarily. Did I skip you? No, I didn't.

MEMBER MARCH-LEUBA: No, you said Charlie was here. His name is not here.

CHAIRMAN BLEY: No, but he's -- yeah. Member Riccardella is attending the meeting via teleconference. And he is on the line. Derek Widmayer of the ACRS staff is the designated federal official for this meeting.

The purpose of today's meeting is to review the draft proposed rule, Emergency Preparedness

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1 for Small Modular Reactors and Other New Technologies,
2 and its associated draft Regulatory Guide, DG-1350.

3 The Subcommittee will gather information,
4 analyze relevant issues and facts, and formulate
5 proposed positions and actions as appropriate for
6 consideration by the full Committee.

7 The Committee is scheduled to address this
8 matter at the October 2018 full Committee meeting.
9 This service was established by Statute, and is
10 governed by the Federal Advisory Committee Act, FACA.

11 That means that the Committee can only
12 speak through its published letter reports. We hold
13 meetings to gather information to support our
14 deliberations.

15 Interested parties who wish to provide
16 comments can contact our offices requesting time
17 after the Federal Register Notice of the meeting is
18 published.

19 With that said, we also set aside time for
20 extemporaneous comments from members of the public
21 attending or listening to our meetings. Both comments
22 are also welcome.

23 The ACRS section of the USNRC public
24 website provides our charter, bylaws, letter reports,
25 and transcripts of all full and Subcommittee meetings,

1 including slides presented at the meetings.

2 Detailed proceedings for conduct of ACRS
3 meetings was previously published in the Federal
4 Register on October 24, 2017.

5 This is open to public attendance, and we
6 have received requests for time to make oral
7 statements from several industry representatives.
8 Time has been allotted in today's agenda to allow for
9 these statements.

10 We also have received several written
11 statements, copies of which have been distributed to
12 Subcommittee Members and are available for the public
13 at the back of the room.

14 Today's meeting is being held with a
15 telephone bridge line allowing participation of the
16 public over the phone.

17 A transcript of today's meeting is being
18 kept. Therefore, we request that any participants on
19 the bridge line, when they are called upon to identify
20 themselves when they speak, and to speak with
21 sufficient clarity and volume so that they can be
22 readily heard.


23 Participants in the meeting room should
24 use the microphones located throughout the meeting
25 room when addressing the Subcommittee and likewise,

1 identify yourselves and who you're with.

2 At this time I ask that attendees in the
3 room please silence all cell phones and other noise
4 making devices.

5 And remind speakers at the front table and
6 this table to turn on their microphone indicated by
7 the illuminated green light, and the button's right
8 nearest you where it says push, every time you talk.
9 And please turn them off when you're finished because
10 we get interference on the phone lines otherwise.

11 We will now proceed with the meeting. I
12 call upon Patricia Holahan, Director of the Division
13 of Rulemaking Office of NMSS to make introductory
14 remarks. Trish?

15  DR. HOLAHAN: Thank you. As I said ear --
16 or as you said, I'm Dr. Trish Holahan. I'm the
17 Director of the Division of Rulemaking. And I'm
18 incognito. I don't have a name tag, so.

19 I'd like to take this opportunity to thank
20 the Subcommittee for allowing us this opportunity to
21 discuss with you the Emergency Preparedness for Small
22 Modular Reactors and Other New Technologies proposed
23 rulemaking.

24 In the staff requirement's memorandum,
25 SECY 15-0077, the Commission approved the staff

1 proposal to initiate rulemaking to develop alternative
2 EP requirements and implementing Guidance for small
3 modular reactors and other new technologies in part to
4 reduce requests for exemptions for the current EP
5 requirements and promote regulatory stability,
6 predictability, and clarity to the licensing process
7 for these future facilities.

8 Then in the SRM on SECY 16-0009, the
9 Commission actually approved our rulemaking plan to
10 move forward. The new alternative EP requirements and
11 implementing Guidance adopt a consequence oriented,
12 risk-informed, and performance-based approach as well
13 as being technology inclusive.

14 It would provide an option to all future
15 small modular reactor and other new technology
16 facilities to be licensed after the effective date of
17 the final rule.

18 The proposed rule does not include within
19 its scope emergency planning preparation and response
20 for large light water reactors, fuel cycle facilities,
21 or currently operating non-power reactors.


22 However, as you will hear further from
23 Kenny Thomas in his presentation, the Federal Register
24 Notice has a question regarding whether the scope of
25 the rulemaking should be expanded to include other

1 facilities such as large light water reactors.

2 The --

3 CHAIRMAN BLEY: Can I interrupt you? I'm
4 sorry to interrupt your opening statement.

5 DR. HOLAHAN: No.

6  CHAIRMAN BLEY: That part's kind of new to
7 me. Where did that come? The consideration for large
8 LWRs?

9 DR. HOLAHAN: It came about through the
10 concurrence process. There was a question because
11 SECY 15-0077 wasn't -- didn't clearly articulate why
12 we couldn't include light water reactors.

13 CHAIRMAN BLEY: So that will be considered
14 during the rulemaking?

15 DR. HOLAHAN: Well, we'll ask a question.

16 CHAIRMAN BLEY: Okay.

17 DR. HOLAHAN: Yeah.

18 CHAIRMAN BLEY: Thank you. Go ahead. I'm
19 sorry.

20 DR. HOLAHAN: Okay. The associated draft
21 implementing Guidance performance-based emergency
22 preparedness for small modular reactors, non-light
23 water reactors, and non-power production or
24 utilization facilities is intended for use by
25 licensees, applicants, and the NRC staff.

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1 The draft Guidance describes optional
2 approaches and methods acceptable for implementing the
3 new alternative EP requirements in 10 CFR 50.160,
4 Emergency Preparedness for Small Modular Reactors,
5 Non-Light Water Reactors, and Non-Power Production, or
6 Utilization Facilities.

7 As Guidance document DG-1350 does not
8 establish additional requirements, and licensees are
9 free to propose alternative ways for demonstrating
10 compliance with the regulations. And Kenny will be
11 discussing this draft Guidance document in further
12 detail during his presentation.

13 We look forward to addressing any
14 questions or comments that you may have on this SECY
15 paper, the Federal Register Notice, which includes the
16 proposed Rule and statements of consideration, as well
17 as on the Guidance documents, DG-1350.

18 Before I want to -- before I introduce the
19 staff, I want to mention that the draft proposed Rule
20 is on track to be submitted to the Commission for a
21 vote on October 12, 2018, prior to issuance for public
22 comment. Andy will provide you with further details
23 regarding the rulemaking deliverables and schedule.

24 I'd like to especially acknowledge and
25 express my appreciation for the efforts of the Working

1 Group Members. For all of their excellent work
2 involved with this rulemaking effort.

3 Several members from NRR as well as
4 Research, NSIR, NMSS, and NRO are here this morning to
5 support this presentation. Including Kenny Thomas,
6 who's an Emergency Preparedness Specialist in the
7 Office of Nuclear Security and Instant Response.

8 He will be leading the discussion
9 regarding the proposed rulemaking and draft Guidance
10 document. Andy Carrera, the Lead Project Manager for
11 this rulemaking, from my division in NMSS will close
12 the presentation with the upcoming deliverables.


13 And additionally, we have members of the
14 Working Group. And key -- and Office of New Reactor,
15 Office of Nuclear Security and Instant Responses,
16 NMSS, and Office of General Counsel management and
17 staff, including Ed Roach, Ed is in the audience.

18 And I forgot to mention Arlon Costa, which
19 is a Senior Project Manager from the Office of New
20 Reactors. Sorry Arlon. And Keith Compton from the
21 Office of Research, in addition to address any
22 questions you may have.

23 We look forward to an informative
24 interaction with the ACRS staff today. I want to
25 thank the ACRS for its review and support to the staff

1 with regard to this important rulemaking activity.

2 And now I'll turn it over to Arlon.

3  CHAIRMAN BLEY: Before you do, I have one
4 quick thing I wanted to get in. First, there are two
5 areas that I couldn't quite track, and I didn't have
6 time to chase down all the way.

7 DR. HOLAHAN: Okay.

8 CHAIRMAN BLEY: But I hope people will
9 address as we go forward. The one is, it seems to me
10 the most difficult thing about being able to do this
11 well would be to get the source terms right.

12 And near as I can tell, there's only hints
13 that you've got to do that. Or short statements both
14 in the Rule and in the draft Guide. Which doesn't
15 tell us much about how to do that.

16 And I hope you can expand on that later in
17 the morning.

18 DR. HOLAHAN: Okay.

19 CHAIRMAN BLEY: The other one is, I'm not
20 completely clear. I'm not clear, what's different in
21 the proposed Rule and the Guidance for the other
22 aspects of 70-EPZ that's different from Appendix E?

23 And most of that -- most of the Guide
24 deals with what's in the Emergency Plan. And if you
25 can highlight things that are different from the old

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1 Guidance, that would be helpful to me especially.

2 So, with that said, I'd like you to go
3 ahead --

4 DR. HOLAHAN: Okay.

5 CHAIRMAN BLEY: With Ken. It's up to you.

6 DR. HOLAHAN: I'll turn it over to Ken.

7  MR. THOMAS: Good morning. Thank you Dr.
8 Holahan, I appreciate it. I am Kenny Thomas and I
9 will be leading the staff's presentation this morning.

10 I'd like to thank the Working Group again,
11 and the project managers for all their efforts to get
12 here. And this presentation will provide you with the
13 key messages, background, and objectives and a
14 detailed look at the Rule and Guidance.

15 We will discuss the reasons why the staff
16 did not address operating reactors as Dr. Holahan had
17 discussed, on slides four through six. That the NRC
18 is okay with the site boundary EPZ on slide seven.

19 How the EPZ will be calculated on side
20 seven and eight. The reasoning that informed the
21 ingestion planning requirements on slide 11.

22 And offsite planning considerations on
23 slide 12. Next slide, please.

24 The proposed Rule would be technology
25 inclusive. And we provide an option to all future

1 small modular reactor and other new technology
2 facilities licensed after the effective date of the
3 final Rule.

4 The proposed Rule would address those
5 nuclear facilities that have source terms, and by
6 extension, reactor power levels ranging from very
7 small too large.

8 For the sake of convenience, we will use
9 the term other new technologies in this presentation
10 and in some of the associated documents to refer to
11 non-light water reactors, medical radioisotope
12 facilities, and future non-power reactors.

13 However, in the Rule and the Guidance, we
14 don't refer to other new technologies. Rather, we use
15 non-light water reactors, or non-power production or
16 utilization facilities.

17 In the context of this proposal, medical
18 radioisotope facilities to be licensed under 10 CFR
19 Part 50, would also be included within the definition
20 of non-power production or utilization facilities.


21 This Rule proposed to apply the
22 Commission's expectation that advanced reactors would
23 provide enhanced margins of safety and/or use
24 simplified inherent, passive, or other innovative
25 means to accomplish their safety and security

1 functions. Next slide, please.

2 MEMBER SKILLMAN: Before you proceed, Ken

3 --

4 MR. THOMAS: Yeah.

5  MEMBER SKILLMAN: Let me ask you this.

6 I've reviewed the documentation. And DG-1350 does not
7 include ONT. Does not include that effort.

8 I'm not suggesting that it must. But, I'm
9 wondering if an opportunity is being lost? What
10 you've just said is, you're going to include ONT under
11 the definitions of in-house or non-production, smaller
12 facilities.

13 As I was reading all of the documentation,
14 my sense was that the term ONT delivered a punch that
15 was worth continuing with. I thought there was value
16 in that acronym. Because at least in my mind it was
17 offering a view of something different that needed
18 recognition.

19 So, I would suggest you might want to
20 rethink simply writing a definition that includes ONT
21 under something else. When in actuality the term, or
22 the acronym ONT might be one that takes on its own
23 value.

24 One man's opinion. We're a subcommittee
25 here. But that's -- when I read 1350, I said where's

1 ONT? Because you make a great defense of it in your
2 other documentation.

3 MR. THOMAS: Thank you Dr. Skillman. We
4 will take a look at this and we'll consider it. I
5 will let you know that when we kicked this off about
6 three years ago, we set out to identify those power
7 plants within the scope, small modular reactors and
8 other new technology.

9 In 15-0077, or SECY 15-0077, we discussed
10 what those could be, medical radioisotope facilities
11 and non-light water reactors. When we come together
12 as a Working Group to start looking at the construct
13 of the Rule, how do we go around and try to define
14 this?

15 So, we went through a very deliberative
16 process. And that's something that we can reconsider
17 as we move forward with crafting the final rule.

18 And I have a note of it, we will reconvene
19 the Working Group and take a look at it. It's
20 valuable insight. Thank you.

21 MEMBER SKILLMAN: Thank you. Thank you.

22 → MEMBER KIRCHNER: May I -- at the risk of
23 regression, go back to the previous slide. And just
24 a -- I'm stumbling over your choice of words.

25 So, an SMR is less than 1,000 megawatts

1 thermal that may have a modular design. What do you
2 mean by that?

3 MR. THOMAS: Yeah. When we were looking
4 at -- again, we're looking at small modular reactors.
5 And one of the questions that we tried to tackle in
6 the Working Group as a technical group is, so if we
7 had a small reactor come in, would this not apply to
8 a small reactor as well?

9 So, when we start looking at putting the
10 definition, as you'll see in the Rule language in the
11 Federal Register Notice, we said we could have, or may
12 have modular design as defined in Part 52.

13 So, it was important for us to acknowledge
14 that even if a small reactor came in with a small
15 source term, smaller consequences, or less
16 consequences to public health and safety, why wouldn't
17 we want to include that?

18 So, some of the -- what we looked at is
19 maybe squishy language there. May have modular design
20 is our attempt to address even the small reactors that
21 may want to use this as other new technology.

22 So, a small reactor --

23 MEMBER KIRCHNER: That makes sense.
24 That's not what I'm reacting to. I'm reacting to
25 1,000 megawatts is a change in definition from

1 previously what was used for SMRs.

2 And you don't address multiple units
3 explicitly.

4 MR. THOMAS: Okay, so --

5 MEMBER KIRCHNER: Therefore you could have
6 more then 1,000 megawatts on the site. Thermal. And
7 we have that actually in front of us.

8 MR. THOMAS: It's that path right there.

9 CHAIRMAN BLEY: Well, in some of the
10 documentation they say this 1,000 megawatts applies
11 per module.

12 MEMBER REMPE: And that's what I was going
13 to bring that up. I mean, what's the limit here? How
14 many -- if you have an 800 megawatt thermal reactor
15 and they put 12 on a site, are you still going to do
16 per module?

17 MR. THOMAS: That's correct.

18 MEMBER CORRADINI: So, I was going to
19 wait, but since we're not going to let you get off
20 slide number two.

21 (Laughter)

22 MEMBER CORRADINI: So, I'm trying to
23 understand the technical bit. Let's just -- let's
24 just stipulate for a moment that they're all
25 independent.

1 So, 1,000 megawatts per module. Just for
2 the sake of argument. Where is there a calculation
3 that shows 1,000 megawatts is the breakpoint?

4 I'm back at TID-14844, which is not
5 appropriate, because it's reciting and it's expounded.
6 But I'm looking for a calculation for a light water
7 reactor that shrinks, and continues to shrink.

8 And 1,000 megawatts is the breakpoint
9 before changing the peg from automatically ten miles
10 to less than ten miles. Is there such a calculation?

11 Use the alternative source term using TID-
12 14844, using anything.

13 MR. THOMAS: I'm going to call my --

14 DR. HOLAHAN: Lifeline?

15 MR. THOMAS: My lifeline. Yeah, exactly.
16 Thanks Trish. Dr. Compton, will you -- are you able
17 to address this?

18 Or can we take this as a note to follow up
19 with the ACRS?

20 MEMBER CORRADINI: And I'll explain my
21 logic. My logic is I personally know how you guys
22 have structured this from a process standpoint make's
23 sense. I don't have a problem with that.

24 I'm just back with Dennis on source term,
25 source term, source term. Because it's going to be

1 used for citing. It's going to be used for emergency
2 planning.

3 It's going to be used for equipment
4 qualification, control room habitability. It maybe
5 used for all of these things or they maybe different
6 source terms.

7 So, I just want to understand the
8 technical basis of the breakpoint. And I assume
9 somebody did something to justify that.

10 CHAIRMAN BLEY: Or is it just the biggest
11 one you thought you might have to see?

12 MEMBER CORRADINI: Don't give them that.

13 CHAIRMAN BLEY: Because that's technology
14 neutral.

15 MR. ROACH: Good morning. Ed Roach. I'm
16 a Senior EP Specialist in NRC at NSIR. When we
17 started the rulemaking, existing rulemaking had
18 already been completed in the Fee Rule.

19 And the Fee Rule had in Part 171, had
20 previously defined it. And NRO, I believe, worked
21 with the offices to define it as a 1,000 megawatt
22 thermal.

23 And it also had the words, I think,
24 equipment to 300 megawatts electrical deposit.

25 CHAIRMAN BLEY: And any basis?

1 MR. ROACH: We searched for that through
2 the Federal Register, and didn't pull that out.
3 However, in looking at the various designs that were
4 out there, there were discussions relative to where do
5 you make that cut?

6 Previously the Rule and the current Rule
7 states 250 megawatts thermal as the -- as where
8 plants, light water reactor or light water is less
9 than that, or high temperature gas reactors can come
10 in for a case by case evaluation. And the ones that
11 have previously been there have had about a five-mile
12 EPZ.

13 So, off the top there is not a hand
14 calculation that I can give you right now. But we'll
15 pull that.

16 MEMBER CORRADINI: And the only reason I'm
17 asking for it now as -- since the context is the way
18 you've structured the Rule, you've basically, thou
19 shall go find a source term.

20 I'm just trying to understand. Because
21 this is going to affect a number of things.

22 MR. ROACH: Yes.

23 MEMBER CORRADINI: And I guess we're a
24 technical committee, so I'd like a technical basis
25 rather than a legal basis.

1 MR. ROACH: Okay.

2 CHAIRMAN BLEY: Mike said don't leave you
3 an out. But I'm of the persuasion, --

4 MEMBER CORRADINI: I'm sure you are.

5 CHAIRMAN BLEY: That what Trish said
6 earlier is appropriate. There's nothing I read here
7 in the process that says this wouldn't be appropriate
8 for any reactor or any size.

9 We have a shortcut now both for these
10 details. But, if you want to go through all the
11 details it seems to me it's a reasonable approach for
12 any.

13 Although the hard part has been left out
14 so far.

15 MR. SEGALA: And this is John Segala from
16 NRO. I would just like to add, I mean, this is just
17 designating, you now, who can apply the new Rule.

18 In the end they have to demonstrate
19 through calculation and analysis, applying their
20 source term and the different accidents. They have to
21 demonstrate that they can meet the performance
22 criteria or the acceptance criteria in the Rule to
23 have a relaxed emergency planning zone size.

24 CHAIRMAN BLEY: I think we get that. But
25 our question is, why? Where did this come from?

1 What's the basis for saying these are the people this
2 applies to?

3 MS. BRADFORD: Can I jump in for one
4 second? This is Anna Bradford.

5 CHAIRMAN BLEY: If you say who you are.

6 MS. BRADFORD: Yeah. Anna Bradford,
7 Deputy Director in the Division of Licensing, Siting,
8 and Environmental Analysis at NRO.

9 And I was also back in the old Division of
10 Advanced Reactors and Rulemaking. You remember that
11 in NRO. We had all the SMRs, NuScale, Westinghouse,
12 MPOWER, Voltec.

13 So, the small modular reactor, 300
14 megawatt electric, which converts to about 1,000
15 megawatt thermal, was just a term that we were using
16 back when this whole kind of category of reactors came
17 up in the first place.

18 It really just meant to me this category
19 of this type of design of reactor. And the Industry
20 was using this term.

21 You know, we're aiming for under 300
22 megawatt electric per module. So, that's -- it just
23 became more of an okay, given that there's this
24 category of potential designs out there, could they be
25 eligible for a smaller EPZ?

1 So to put it in five that the 1,000 came
2 up strictly when we started working on EPZ. It's been
3 used as kind of the term of art or the name for this
4 category for years, and years, and years, before we
5 started using EP.

6 And so you'll see this later, I think,
7 when we get into the details. And certainly this
8 afternoon when we start talking about specifics,
9 you'll see how we applied that to actually calculate
10 the source term. Because of course the source term is
11 what's most important regardless of what you call it.

12 CHAIRMAN BLEY: Okay. There's a rule
13 people say here. If you get ten seconds, just go
14 ahead.

15 MS. BRADFORD: Okay.

16 MR. THOMAS: Okay, so we're back on slide
17 three if you're following along in the audience or on
18 the phone lines.

19 Let's see. Major provisions of this
20 proposed Rule and Guidance would provide for an option
21 to all future small modular reactors and other new
22 technology facilities.

23 A new alternate performance-based EP
24 framework, including requirements for demonstrating
25 effective response and drills. And exercises for

1 emergency and accident conditions.

2 A hazard analysis for any NRC licensed or
3 non-licensed facility contiguous for a small modular
4 reactor or other new technology facility to identify
5 hazards that could diversely impact the implementation
6 of the emergency plans.

7 A skillful for approach for determining
8 the size of the plum exposure pathway emergency
9 planning zone. Or as we'll keep referring to it as
10 the EPZ.

11 A requirement for licensees to describe
12 ingestion response planning in the facility's
13 emergency plan. Including the capabilities and
14 resources available to protect against contaminated
15 food and water from entering the ingestion pathway.

16 These requirements were applied to those
17 small modular reactor and other new technologies that
18 elect to use the rule in Section 50.160. It's the new
19 section for us. Next slide, please.

20 In this on the next slide, it will try to
21 provide some of the background. Dr. Holahan looked at
22 it just a few minutes ago. She spoke to it and gave
23 the context for some of the decisions to pursue
24 rulemaking for small modular reactors and other new
25 technologies.

1 In 2010 the staff sent to the Commission
2 SECY 10-0034, where the staff presented the potential
3 policy, licensing, and key technical issues for small
4 modular reactor designs.

5 At that time the staff told the Commission
6 that the staff would consider white papers, topical
7 reports, and other information it received from the
8 Department of Energy and applicants to evaluate
9 proposals for site specific proposed emergency plans.
10 The staff also noted its commitment to work with the
11 Federal Emergency Management Agency, FEMA.

12 In 2011, in SECY 11-0152, the staff
13 presented one solution to the policy and licensing
14 issues described in SECY 10-0034 for emergency
15 preparedness. This paper describes the staff's intent
16 to develop a technology neutral, dose based,
17 consequence oriented EP framework for small modular
18 reactor sites that takes into account the various
19 designs, modularity, and co-location as well as the
20 size of the EPZ.


21 Also in 2011 we had a final Rule. It was
22 published to enhance the EP requirements. Then the
23 following years the existing power plants implemented
24 provisions of the final rule, enhanced their
25 capabilities learned from the Fukushima Daiichi

1 accident.

2 In 2014 --

3 MEMBER KIRCHNER: May I stop you again?

4 MR. THOMAS: Yes, sir.

5  MEMBER KIRCHNER: You started out in
6 studying this and all the background material, has
7 there been any analysis by the staff of why this is
8 restricted to singular modules, given the Fukushima
9 events?

10 MR. THOMAS: Analysis?

11 MEMBER KIRCHNER: In terms of a single
12 module being the basis for making the dose estimate?

13 MR. THOMAS: That's a good question. I
14 believe that we're in a -- we're using research to
15 actually identify what the source terms are in the
16 sensitivities of the different accidents that --

17 MEMBER KIRCHNER: I mean, Fukushima in
18 short was a lesson in common mode and common cause
19 failure.

20 MR. THOMAS: Yes, sir.

21 MEMBER KIRCHNER: So why post-Fukushima
22 would we not look at multiple modules?

23 MR. THOMAS: I believe we are, sir. I'm
24 going to turn this over to Dr. Compton.

25 DR. COMPTON: Keith Compton from the

1 Office of Research. Yeah, strictly -- I'll just speak
2 strictly to the doses estimate methodology.

3 I haven't -- we haven't kind of developed
4 that to be strictly limited to a single source term.
5 So, if you had a multi-sourced term, if you generated
6 that, that was something that came out of your
7 analysis, you could.

8 MEMBER KIRCHNER: So for your bounding
9 source term in a severe accident, would we use a
10 source term based on multiple modules or a single
11 module?

12 DR. COMPTON: I haven't -- we haven't, or
13 at least I haven't in the methodology specified
14 exactly how to do that.

15 MEMBER REMPE: Didn't you say in the Rule
16 that you are doing it on a single module? I mean,
17 that's what I was trying to get to earlier with my
18 question.

19 And I agree with Walt, why are you not
20 considering multiple modules on a site? Why are you
21 doing a single module?

22 The other question I was curious about was
23 --

24 MEMBER KIRCHNER: It's not a technical
25 decision then it's a policy decision.

1 MEMBER REMPE: If it's a policy decision,
2 I'd like to understand that. And the other question
3 I have is why 96 hours?

4 A long time ago we used to use the first
5 two hours for siting. And they decided with some of
6 the advanced designs that the worst two hours should
7 be used.

8 Now if we have 96 hours again, we don't
9 know what designs are going to come through in the
10 future. So what happens if somebody has a pool of
11 water that boils away?

12 All their modules are in, and again, I'm
13 not picking on a particular design. I'm trying to
14 think of Joe's reactor that a former member used to
15 always mention.

16 If there's a bump up at 100 hours because
17 that water boils away at 97 hours. And you know,
18 again, should you not have something more than 96
19 hours?

20 I'm just curious again, why 96 hours? And
21 that was mentioned in the Rule, the draft Rule.

22 MR. TAYLOR: If I can, I'm Robert Taylor,
23 Branch Chief in NSIR Division of Preparedness and
24 Response.

25 To address the multiple source term and

1 such. The methodology for EPZ size determination
2 talks to source term.

3 But it talks to also the accident
4 conditions that occur at the site, which would need to
5 make considerations for multiple co-located facilities
6 on the site. Which would include other source term
7 sources essentially. Where they can come from.

8 So, it's not restricted to only the module
9 that's being licensed at the time. It would be any
10 design accident that the applicant would be including
11 in their analysis, which would include accidents of
12 multiple facilities at the site, multiple modules.

13 MEMBER REMPE: I saw that word and I
14 thought about well, they must be thinking about the
15 spent fuel pool. But I kind of found the good --

16 MR. TAYLOR: The spent fuel pool and other
17 modules, and other types of facilities not restricted
18 just to the same type of reactor.

19 MEMBER REMPE: I agree that you might be
20 able to interpret the verbiage in the draft Rule so
21 that it would be that way. But jeepers, we're talking
22 about small modular reactors in this rulemaking.

23 We might not be a little more explicit,
24 because it's real vague that that -- and you know, I
25 was trying to read it. It's like are they considering

1 multiple modules or not?

2 It wasn't clear to me. And again, I spent
3 some time trying to understand it. But maybe I'm not
4 a lawyer or I didn't see another one.

5 MR. TAYLOR: We don't want to restrict it
6 to just the additional modules that maybe present at
7 the site. We wanted to make it general in nature to
8 include other sources of source terms.

9 MEMBER REMPE: Okay. So, put in purposing
10 --

11 MR. TAYLOR: Which would include the
12 commonality of a spent fuel pool --

13 MEMBER REMPE: Um-hum.

14 MR. TAYLOR: Between modules and the
15 reactor at the same time modules. So, that would be
16 an analysis and would be based upon the credible
17 accidents that occur at the site, in the analysis that
18 the applicant would provide to us.

19 MEMBER REMPE: It looks like you could put
20 a parenthetical statement saying this is what --

21 MR. TAYLOR: A little bit more precise?

22 MEMBER REMPE: Yeah. A little more common
23 college that -- or easier to understand language would
24 have been helpful to me.

25 But again, I'm an engineer.

1 → MEMBER CORRADINI: So, can I take a little
2 bit different question? Is the anticipation of staff
3 that the source term an applicant may use to insert
4 into this process the same source term that would be
5 used for siting?

6 MR. COSTA: Let's go back to siting first
7 for a second. If you recall, in siting we have the
8 measurements have to do with specifically for siting.

9 And in the part of siting that's
10 associated with EP, is how you're going to deal with
11 the capabilities to move people away from the zone.
12 So, that number is very high as you recall.

13 So the one rem number that we're talking
14 about here is, she mentioned the 96 hours, is way more
15 -- is much smaller then the one in comparison to the
16 site.

17 But, for our rule it's specifically for
18 emergency preparedness. So it's not associated with
19 that number for siting.

20 MEMBER CORRADINI: Okay. So, is that a
21 yes or a no? I'm trying to understand. In other
22 words, if I today am going to apply for I'll Joy's and
23 a former member's, Joe's reactor.

24 And Joe's reactor is coming in, they're
25 going to have to develop a source term for a number of

1 applications. My main question is, is the siting
2 source term expected to be the same source term as for
3 the EP?

4 MR. COSTA: The rule that we have right
5 now for siting is much -- the number, the 25 rem
6 number, if you compare that to the one rem, is much
7 smaller.

8 So anybody that makes -- meets the siting
9 criteria of 25 rem in comparison to the one rem for 96
10 hours that we have for EP, it's pretty obvious that
11 they make it for the emergency preparedness
12 measurements.

13 MEMBER CORRADINI: Okay.

14 MR. COSTA: Which is much more strict than
15 the siting number.

16 MEMBER CORRADINI: Are you going to put a
17 lot of that to her for reference?

18 MR. THOMAS: We also have Michelle Hart
19 from the Office of New Reactors standing by to answer.

20 MS. HART: Yes. As Kenny said, I'm
21 Michelle Hart in the Office of New Reactors. I do the
22 siting analysis, and I've also been on the Working
23 Group for this Rule. Proposed Rule, excuse me.

24 The source terms that you're talking
25 about, there's not just one source term. For the

1 emergency preparedness, there's a range of accidents
2 that they need to look at.

3 It may include, it should include the
4 source term that they use for siting. So that design
5 basis accident source term would only give credit for
6 safety-related equipment.

7 But all of these accidents would be like
8 severe accidents, wouldn't include it.

9 MEMBER CORRADINI: So the -- so from your
10 experience, the one for siting may not be the bounding
11 one. There would be --

12 MS. HART: That's correct.

13 MEMBER CORRADINI: Okay. Okay. All
14 right. Thank you.

15 MS. HART: Okay.

16 CHAIRMAN BLEY: Okay.

17 MR. THOMAS: Ten second rule I guess.
18 Okay. In 2014 we're somewhere around the last bullet
19 on this slide.

20 In SECY 14-0038, the staff stated that a
21 performance based over site regime could simplify EP
22 regulation of focused inspections. More fully on,
23 response related performance rather than the current
24 focus on plant maintenance and compliance.

25 However, the staff recognized that the

1 existing programs provide reasonable assurance and
2 protection of public health and safety. Therefore,
3 the staff recommended at that time that the current EP
4 regime for existing facilities be maintained.

5 This rulemaking was based on the earlier
6 work presented in these SECY papers. The Working
7 Group addressed the issues related to modularity, the
8 designs, the potential for co-locating the reactors
9 near industrial facilities, and the size of the EPZ.
10 Next slide, please.

11 Continuing with some of the background on
12 slide five. In the staff requirement's memorandum to
13 SECY 14-0038, which was published in September 2014,
14 the Commission approved the staff's recommendation not
15 to pursue rulemaking for implementing the performance
16 based EP framework for operating nuclear power plants.

17 Additionally, the Commission stated that
18 the staff should remain vigilant in continuing to
19 assess the NRC's EP program. And should not rule out
20 the possibility of moving to a performance based frame
21 work in the future.

22 The Commission also noted the potential
23 benefit of a performance based EP regiment for small
24 modular reactors. The staff should return to the
25 Commission if it finds conditions warrant rulemaking.

1 A few months later in April 2015, the
2 staff sent SECY 15-0077 to the Commission to request
3 initiating rulemaking to revise the regulations and
4 guidance for EP for small modular reactors and other
5 new technologies such as non-light water reactors and
6 medical radioisotope facilities.

7 The staff proposed a consequence-based
8 approach to establish new requirements as necessary
9 for offsite EP. And to establish EP requirements for
10 small modular reactors and other new technologies that
11 are commensurate with the potential consequences to
12 public health and safety.


13 The EP for small modular reactors and
14 other new technologies, including addressing the EPZ
15 size would enable the NRC staff to develop regulations
16 and guidance to provide for regulatory stability,
17 predictability, and clarity in the licensing process.
18 And would minimize or eliminate the uncertainty for
19 applicants and the inefficient use of agency resources
20 caused by reliance on serial EPZ size exemption
21 requests.

22 The staff requirement's memorandum to SECY
23 15-0077, the Commission approved the staff's request
24 to initiate rulemaking for small modular reactors and
25 other new technologies. And stated that the staff

1 should keep in mind the Commission's previous
2 direction from the SRM for SECY 14-0038 in mind.

3 This rulemaking began in 2016, and the
4 Commission approved the staff's proposed schedule in
5 SECY 16-0069. Next slide, please.

6 So here we're addressing one of the
7 questions where the staff's attempting to address what
8 about the operating reactors? And one of the
9 questions I believe from Dr. Corradini earlier is what
10 is -- where did this come from?

11  So, -- or Dr. Bley, sorry. The existing
12 regulatory oversight program provides reasonable
13 assurance that public health and safety is protected.

14 Given the recent to EP regulations and
15 guidance, such as the enhancements to the EP final
16 rule in 2011, and the Near-Term Task Force recommended
17 action and lessons learned implemented by the industry
18 developing and implementing a rule with the resources
19 from higher priority projects for both the NRC and for
20 the industry.

21 So, we did not address operating reactors
22 within this Rule. Next slide, please.

23 CHAIRMAN BLEY: Ken, if I recall, in one
24 of the documents I read, the argument for that was it
25 just would be too much of a burden for an existing

1 reactor to even consider this at this point.

2 Is that right? Is my memory correct?

3 MR. THOMAS: We did make that case in the
4 documents.

5 CHAIRMAN BLEY: Yeah.

6 MR. THOMAS: In the regulatory basis, I
7 believe. And in the FRN we talked to it again.

8 CHAIRMAN BLEY: Yeah.

9 MR. THOMAS: It was based on the input in
10 the public meetings that we had with the industry.
11 We've had two public meetings with the industry.

12 One in August 2016 when we addressed or
13 asked the question whether a performance based rule
14 would be beneficial for small modular reactors, as the
15 direction we should go.

16 And again, when we published the draft
17 regulatory basis document in May 2017, we had a public
18 meeting that also addressed this. So, it's based on
19 the interactions that we did have with the industry.

20 And they felt at that time it would be too
21 costly to actually change to a new program when the
22 existing program provided reasonable assurance.

23 CHAIRMAN BLEY: Thanks.

24 MEMBER KIRCHNER: For clarification, was
25 that the NEI comment that you referenced in your

1 previous paragraph?

2 MR. THOMAS: That's a -- that's a good
3 question. NEI did make a comment to us when they were
4 -- we were soliciting public comments on the draft
5 regulatory basis.

6 About expanding the scope of the
7 rulemaking to include operating reactors. At that
8 time when we were -- and we have a slide that actually
9 addresses this at some point.

10 At that point we initially felt that that
11 comment was out of scope. Because we felt that the
12 scope was established by the SRM to SECY 15-0077, go
13 out and do rulemaking for SMRs and ONTs.

14 Based on what we learned during the
15 concurrence process for this set of documents, it was
16 raised by individuals who were reviewing it. And it's
17 like there's nothing in this rule that would not apply
18 or could not conceivably apply to large light water
19 reactors or the operating fleet.

20 So, we're revisiting that by including a
21 question in the FRN about including them within the
22 scope of this regulation.

23 MEMBER KIRCHNER: Thank you.

24 MR. THOMAS: Okay. Next slide please.
25 Slide seven. Discussing the scalable approach for

1 plume exposure pathway, EPZ.

2 The EPZ size would be scaled in proportion
3 to the potential consequences in a similar manner as
4 the NRC uses for operating research and test reactors
5 for fuel cycle facilities and independent fuel --
6 spent fuel storage installations under the existing
7 rules, since it would be a consequence oriented
8 approach to provide the same level of protection to
9 the public, health and safety as afforded to other
10 facilities.

11 Next slide, please. The staff is
12 proposing that applicants who select to comply with
13 the new Rule provide an analysis that supports the
14 request the EPZ size. The requirements would be in
15 Sections 50.33 and 50.34 of 10 CFR.

16 For the EPZ size determinations, the size
17 of the EPZ would encompass an area where prompt
18 protective actions such as evacuation of sheltering,
19 maybe needed to minimize the exposure to individuals.

20 If the applicant or licensee demonstrates
21 that prompt protective measures are not required due
22 to the timing of the releases from a credible
23 accident, or that extended time exists after release
24 and prior to reaching the need for evacuation or
25 sheltering such that the state and local authorities

1 could initiate actions in sufficient time to
2 adequately protect the public health and safety, such
3 accidents maybe excluded from consideration in
4 determining the size of the EPZ.

5 If the proposed EPZ extends beyond the
6 site boundary, then the exact size -- sorry, the exact
7 shape of the EPZ would need to be determined in
8 relation to the local emergency response needs and
9 capabilities as they are affected by such conditions
10 as demography, topography, land characteristics,
11 access routes, and jurisdictional boundaries. Next
12 slide, please.


13 Slide number nine. The existing EPZ
14 Guidance for nuclear power plants. Large light water
15 reactors use a variety of guidance documents in
16 support of their EP programs.

17 Among the various documents I'm discussing
18 NUREG-0396. 0396 provides the basis for federal,
19 state and local emergency preparedness organizations
20 to determine the appropriate distance for which
21 emergency response planning efforts around a nuclear
22 power plant.

23 It introduced the concepts of a generic
24 emergency planning zone as a basis for planning the
25 response actions that would result in dose savings in

1 an event of a serious power reactor accident.

2 These concepts were included in the final
3 Rule in 1980 in Sections 50.33, 50.47, and in Appendix
4 E to Part 50. And required a ten-mile plume exposure
5 pathway EPZ, and a 50-mile injection pathway EPZ
6 around each nuclear power reactor. Next slide.

7  MEMBER REMPE: Excuse me. In the draft
8 Rule, you mentioned two documents, ML 18064A317 and ML
9 18114A176 that are not available on the public NRC
10 website.

11 Some of the information in those documents
12 is included in the draft Guide in Appendix A. But,
13 are you planning to issue those before the draft Rule
14 becomes public? And what's their status?

15 MR. THOMAS: I'm not sure. Dr. Rempe,
16 could you repeat those ML numbers for me?

17 MEMBER REMPE: Sure. ML 18064A317 and ML
18 18114A176. That's on the bottom of page 78 and 79 and
19 -- the top of page 79 of the draft Rule. Generalized
20 dose assessment methodology for forming emergency
21 planning zone size determinations and required
22 analysis for informing emergency planning
23 determinations.

24 CHAIRMAN BLEY: Keith's an author on
25 these.

1 MEMBER REMPE: Yeah. You know which
2 documents I'm talking about folks?

3 (Off mic yeses.)

4 MR. THOMAS: Dr. Compton is --


5 MEMBER REMPE: And you actually quote
6 things in Appendix A of the draft Guide.

7 DR. COMPTON: Yeah. I think those
8 documents are complete and they can be -- or filed as
9 public.

10 MEMBER REMPE: Okay. Thank you.

11 MEMBER SKILLMAN: Ken, I would like to ask
12 this question, please.

13 MR. THOMAS: Sure.

14  MEMBER SKILLMAN: As I look at this slide,
15 and I've got a pretty good understanding of how large
16 a power plant executes under this NUREG.

17 MR. THOMAS: Yes, sir.

18 MEMBER SKILLMAN: The get done track for
19 the emergency preparedness organization at the site is
20 the accumulation of the EALs. You begin with them.

21 And you go event, you get an alert. You
22 get a site area emergency. And when you see
23 radiological conditions further decaying, when you
24 push that button to go to general, you realize that
25 you're evacuating schools and nursing homes and

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1 hospitals.

2 That is a big, big deal. So, at this time
3 I'm look -- I'm listening to your presentation. I've
4 looked at the background documents.

5 And I'm looking at Draft Guide 1350, and
6 I'm thinking about EALs. What is your thought, and
7 this is just a general question.

8 What's your thought about EALs when the
9 source term is low and the offsite release is also
10 very low for some of these ONTs?

11 And how do you develop EALs when there is
12 almost nothing to deal with?

13 MR. THOMAS: Well, I believe that we have
14 several models that we could use for that or the
15 industry could take a look at. We have a --

16 MEMBER SKILLMAN: Has the industry
17 responded to that? And they said hey, you know, that
18 you've got -- you've got technologies here where the
19 source term is so very, very low, we're not really
20 sure how to develop an EAL for this.

21 MR. THOMAS: We have not engaged the
22 industry at this time to address that specific
23 question. But within our own documents and within our
24 own constructs, if we were to look at NUREG-0849 for
25 research and test reactors, there's an EAL scheme

1 there.

2 We've endorsed ANSI Standard 1516 that
3 also has an EAL scheme that for really small source
4 terms, for those type of facilities. I'm not the
5 expert on that.

6 I could ask Mr. Lynch to address that as
7 well. But, we do have the different models for --
8 that does address emergency classification levels and
9 EALs for these types.

10 What we do expect from the rule, as you
11 look at the -- in the FRN, the proposed Rule, is that
12 they have to be able to classify the event.

13 So again, that's when the bells and
14 whistles start going on. And that's when the plant
15 needs to be thinking that they're in an emergency
16 situation. They have a condition that meets their
17 initiating condition.

18 We expected the various designs to have
19 different EALs. One size will not fit all.

20 If we look at NUREG-0654, there's a set of
21 EALs that we published in NUREG-0645. And those EALs
22 for large light water reactors have evolved quite
23 dramatically in the 40 years that we published NUREG-
24 0654.

25 And I think we're in rev six of NEI 99-01.

1 And so it -- they can vary from -- based on the
2 operating experience for the industry that we felt was
3 of major importance back in 1980 through the various
4 revisions, they've refined where those emergency
5 classifications and those EALs fall.

6 In order to support this Rule, to
7 implement this Rule, the industry and then specific to
8 designers will have to actually evaluate their plants
9 and determine what their EAL list is.

10 We give a template in the DG that kind of
11 -- if you look at the existing ones, the abnormal
12 radiological conditions, you have to be able to
13 address those.

14 The hazards. What are those hazards? And
15 that might be where the hazard analysis from
16 contiguous plants, those EALs maybe incorporated in
17 that. And there are analyses for those adjoining
18 contiguous plants need to be able to address that.

19 You know, equipment malfunctions. If you
20 have a design that relies on, you know, AC, DC, or
21 specific ECCS, those casualties have to be addressed
22 on your emergency classification scheme, the EALs and
23 initiating conditions.

24 And then your radiological barriers,
25 fission product barriers in the current scheme. We

1 would expect something analogous or very similar to
2 that for plants.

3 For the technical staff, we look at a
4 whole range and spectrum of different plants and
5 designs from the light water, small modular reactors
6 to small reactors to sodium fast reactors, molten salt
7 reactors with vacuous fuel.

8 So, developing those specific EALs was not
9 our intent for the Working Group. What we wanted to
10 do is follow what we were instructed to do, was to be
11 technology inclusive.

12 And then for the specific designs to come
13 in and describe your design. And then much like your
14 experience, you look at this and this doesn't make
15 sense.

16 The staff would also have to go, did you
17 look at abnormal radiological conditions? Did you
18 look at equipment malfunctions?

19 Did you look at whatever your fission
20 product barriers is? Is there a loss of containment?

21 For a sodium fast reactor, there's a
22 containment function as opposed to maybe a metal
23 building. So, the EALs is where it starts.

24 It's the one EPIP, the emergency planning
25 implementing procedure that you never leave. You're

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1 always in your classification procedure from the day
2 you start your program.

3 You know, I can't as an operator person,
4 I can't just close the book because it's -- that's the
5 one procedure. I'm always scanning.

6 My reactor operators are always scanning
7 to make sure that we're in that -- in the right place.
8 Operating in the right place.


9 And when it's not, I'm familiar enough
10 with that procedure and my EALs to immediately go
11 there. So, personally, based on my experience, EALs
12 is fundamental.

13 For today, for tomorrow, in the past, it's
14 that important that we address and try to give those
15 considerations in the draft Guide.

16 MEMBER SKILLMAN: That's sufficient.
17 Thank you very much. Thank you.

18 MR. THOMAS: I could talk about it all
19 day.

20 (Laughter)

21  CHAIRMAN BLEY: I wanted to sneak in a
22 question related to what was going on just before
23 that.

24 Those two papers were brought up, and they
25 aren't public yet. It sounds like they will be soon.

1 MR. THOMAS: Right.

2 CHAIRMAN BLEY: Those papers, like all the
3 other Guidance and like everything else I've read,
4 have an icebox. And as Michelle said, you've got to
5 do the source terms, you've got to do some area
6 specific source terms.

7 But so far we've got no guidance on how
8 you want people to do that. Do you anticipate
9 developing such guidance into the draft Reg Guide
10 before it's published?

11 Or are you leaving this up to the poor
12 folks who are going to have to send you a lock?

13 MR. COSTA: This is Arlon Costa. The
14 Guide that we have right now, it's overarching. So,
15 it's the big picture for the whole group.

16 CHAIRMAN BLEY: It hints there will be
17 something on source terms.

18 MR. COSTA: Right. So, because this is
19 technology inclusive, we expect that, well, right now
20 we don't have any application for some of these newer
21 technologies that we're talking about, like molten
22 salt reactors or the other one.

23 So, there will be a time when we're going
24 to have to address that. But, the Guide --

25 CHAIRMAN BLEY: Yeah. I wasn't asking for

1 an example. I was asking for guidance on how to
2 actually do those calculations.

3 MR. COSTA: Right. That will be there.
4 When we come to specificity, we may need to develop a
5 new Guide for those specific types of reactors coming
6 our way.

7 MEMBER CORRADINI: But I think what Dennis
8 is asking is, why in advance -- well, I mean, if I
9 were an applicant, I'd like to know way in advance
10 some general guidance to know what I have to throw
11 over the fence--

12 CHAIRMAN BLEY: Right.

13 MEMBER CORRADINI: Before I throw it.

14 MEMBER REMPE: For example, a cut off
15 frequency.

16 MR. THOMAS: That's the exact same
17 questions that the Working Group and the Steering
18 Committee have been tackling. And then whether to
19 talk specifically to what's gone on recently with the
20 licensing.

21 We had two vendors who came to us in early
22 discussions prior to the licensing. And the staff
23 developed what we call design specific review
24 standards.

25 We do envision that process continuing

1 forward. And we've engaged those individuals in NRO
2 to find out if that's a feasible process to moving
3 forward, as a design is going through its design
4 phases.

5 Hopefully the vendors come to us and talk
6 to us early enough to where we're starting work. We
7 get the information. We start looking at the standard
8 of review plan, NUREG-0800.

9 And we look at this Guidance and say what
10 do we need to do to address those specific reviews and
11 those specific contest via application?

12 CHAIRMAN BLEY: I must not be speaking
13 clearly. What I'm looking for is comments in
14 principal on how one does this.

15 What considerations need to be worked out?
16 What kind of calculations need to be done? Not what's
17 the specific source to input in a particular reactor.

18 And that's missing. And part of my
19 concern is some vendors are deeply, technically
20 competent and know what's involved here. Others maybe
21 not on this area.

22 And with no guidance at all, it's -- it
23 smells like a trap. You know?

24 MEMBER KIRCHNER: If I could add in here,
25 I think you underestimate how difficult this is to do.

1 And since that view graph is up, if you go back, I
2 have it with me.

3 They -- the task force that did 0396 did
4 what I thought, and I'll use their words, the prudence
5 approach. That remember this was done before TMI and
6 before Fukushima. In the late '70s.

7 And they realized then, even for the
8 commercial LWR fleet, which is much more mature then
9 than any of the advanced designs we're thinking about
10 now. That they couldn't bound the possibilities.

11 WASH-1400 had just been issued a couple of
12 years before. So they took that in consideration.
13 And then they stepped back from that.

14 And I think it's relevant, if you'll
15 indulge me, Dennis, the Task Force recognized that
16 more specific events with respect to acts and
17 incidents, consequences would be more severe then
18 design accidents, should be explicitly considered in
19 the process.

20 And that emergency response plans should
21 provide dose ABs for a spectrum of accidents that
22 could produce offsite doses in excess of the PAGs.
23 And that the planning basis is independent of a
24 specific accident sequence.

25 And then they went onto reference the

1 reactor safety study. And then they fin -- they
2 concluded that in the Task Force's judgement that
3 offsite planning for a generic distance around a
4 nuclear power plant is prudent and useful.

5 And that's because they recognized the
6 difficulty of covering the spectrum of accident
7 sequences that could -- that could occur.

8 Now we're dealing with new designs that
9 don't have the maturity or the PRA base that -- and
10 won't. Because many of them are paper designs.

11 So you're not going to have the
12 confidence. The uncertainties are going to be large.

13 So now if we go to the first principal
14 source term calculation, the uncertainties that
15 propagate through that calculation are enormous.

16 It's almost like compound interest when
17 you go through and see how your uncertainties grow in
18 trying to get your arms around a spectrum of source
19 terms that you could have from the many accident
20 scenarios.

21 And so with the slide up there, I wanted
22 to ask you what you believe is the prudent approach
23 given that you're stance of technology neutral right.

24 Would you not fall back on some minimum
25 take the source term which the first order correlates

1 with the power level? And then back out a bounding
2 set of calculations based on a worst case.

3 And then would you not come back to
4 exactly where the Task Force wound up? That's how
5 they came up with the ten miles by the way.

6 There is actually some -- there is some
7 actual technical basis for that. They looked at a
8 large spectrum. And then they looked at the fall off
9 with distance and weather conditions.

10 And then that's where the ten, you know,
11 the ten miles came from.

12 MR. THOMAS: Right.

13 MR. COSTA: And what you've said is our
14 expectation.

15 In fact, this is the point I was trying to
16 explain to Dr. Blue about the guidance that we have
17 general picture of what the Applicant of licensee will
18 have to do, something similar to exactly what you
19 said.

20 And that's why in our general guidance
21 that we have right now, which is technology inclusive,
22 we even provide a figure where we start with a source
23 term, we identify the release scenario, evaluated the
24 source term information, as described in the
25 instruction that we give, and then we go to the next

1 step.

2 What's the meteorological data development
3 that you're going to have, and then the following one
4 is what are the atmospheric transport models that
5 you're going to need, and then what is the exposure
6 model, and then the dose estimates that you have to
7 do, and also the probabilistic dose aggregations that
8 you have to have.

9 So, we understand precisely what you said
10 so this guidance is thinking technology inclusive and
11 we need to address that. That's just the fact.

12 MEMBER REMPE: So what you're saying is in
13 Appendix A of the draft guide and it was in those two
14 documents that aren't public, but when I was looking
15 at that, I really had wanted to see multiple modules
16 again explicitly called out.

17 It's not stated there. And then it would
18 be nice to think about a cut-off frequency, that's a
19 big thing.

20 CHAIRMAN BLEY: Let me ask you a question.
21 Is this assuming the rulemaking goes forward?

22 Somewhere before it's over, when maybe
23 these ideas have been fared out a little bit more, I
24 think it would be useful if we could have another
25 conversation and dig into some of the details of those

1 two papers and other things.

2 It's the same kind of picture we had
3 elsewhere. It's nice boxes that say what you have to
4 do but there's no hint of the work hidden inside those
5 brief little boxes.

6 So we'd love to dig into that sum with you
7 either before or at the end of this process, but I
8 think now there's nothing to dig into.

9 DR. HOLAHAN: We can do that and the
10 Steering Committee raised this issue as well and at
11 the time, we didn't have any Applicants. So we didn't
12 know but we always talked about needing further
13 guidance for individual Applicants.

14 MEMBER CORRADINI: So if I might just ask,
15 if you were to point to something for us to study, I
16 would assume the ESP for Clinch River is the closest
17 thing?

18 MR. COSTA: Well, Clinch River is under --

19 MEMBER CORRADINI: That's not for you, I
20 was throwing the ball over to the fellow with the
21 yellow shirt over there.

22 (Simultaneous Speaking.)

23 MEMBER KIRCHNER: -- again from the Clinch
24 River early site permit.

25 MEMBER CORRADINI: That's the only thing

1 practically that I would assume there is a calculation
2 by the Applicant and one can look at the details of.

3 MR. COSTA: Let me just clarify something,
4 and I think you're aware of this but maybe for the
5 public, for the Clinch River application, the
6 discussion that will be this afternoon is under the
7 current rule, under the current process that we have.

8 And what we're proposing today is
9 something totally new for technology-inclusive so that
10 will be different. So you're going to be looking at
11 NUREG-0396 and the documents that Walter mentioned
12 earlier.

13 So it's a different approach.

14 MR. THOMAS: Let me toss this back over to
15 Dr. Compton and Mr. Segala.

16 MR. SEGALA: This is John Segala. I would
17 just like to add, developing a source term for a
18 design is essential for licensing so we're going to
19 have to come up with a source term to do the design
20 basis accidents as well as EP.

21 This is not solely an EP issue, this is
22 something that you need and I think going into this
23 gives the assumption that they'll be able to develop
24 a source term for whatever particular design comes
25 forward.

1 Maybe this is something that down the road
2 we need to develop some sort of guidance to help these
3 new technologies come up with what are all the steps
4 they need to do to develop a source term. I'm not
5 sure that's strictly an EP issue.

6 MEMBER CORRADINI: And just speaking for
7 myself, I'm assuming they similarly are not but this
8 is the first thing, this is one of the applications of
9 it that make it quite important.

10 So we're looking for some sort of
11 generalized guidance so, as Dennis said, you don't
12 have a range of individuals that are highly
13 sophisticated and maybe not as sophisticated and they
14 don't appreciate the task ahead of them.

15 MR. SEGALA: I think that's probably why
16 we encourage early pre-application engagements, so we
17 can start talking to these developers and what are you
18 doing to develop that, what kind of --

19 MEMBER REMPE: Some of the Meetings we've
20 had on other topics related to this, some of the Staff
21 had said, well, we've got some of these little
22 reactors that just want to release the whole inventory
23 and they have such a small amount it won't matter.

24 And yet, if you're doing this to qualify
25 any sort of mitigating strategies, the chemistry, the

1 timing is important. And so I think those kind of
2 questions also need to be thought about.

3 Is that really acceptable to say I'm going
4 to just have the source term, just let the whole thing
5 go, and I don't care about any sort of chronological
6 or mechanistic type of considerations?

7 MR. SEGALA: I mean the NRC and maybe
8 Steve can talk about it. We do consider maximum
9 hypothetical accidents.

10 MEMBER REMPE: In an appropriate way?

11 MR. SEGALA: To take an approach that's
12 very conservative and clearly conservative, and that
13 is the approach that we have considered.

14 MEMBER REMPE: But in the past, sometimes
15 what we think is conservative has turned out to not be
16 conservative.

17 The TID source term was not perhaps the
18 most conservative when we think about it later. So
19 those kind of things need to be thought about perhaps.


20 MR. LYNCH: And just to briefly add onto
21 that, this is Steve Lynch, I'm a Project Manager in
22 the Office of Nuclear Reactor Regulation.

23 As John said, we do at times consider
24 these maximum hypothetical accidents, whereas, some
25 Applicants may choose to take credit for a complete

1 release of inventory. But that's not something we
2 could accept in the Office.

3 It will depend on what are the
4 consequences of that complete release? Where we have
5 accepted that, it's been where Applicants have still
6 demonstrated that even with that complete release,
7 they're still meeting Part 1 for what's considered
8 normal release at the site boundary so 100 millirem.

9 So that's an example of where maybe a
10 complete release might be acceptable. For larger
11 source terms, that's not something the Staff would
12 necessarily accept. It would be considered on a
13 case-by-case basis.

14  MEMBER CORRADINI: So let me ask you a
15 historical question since Will brought it up, which I
16 thought was interesting. 0396 has a technical basis
17 in how they came to the ten miles.

18 Has there been any sort of analysis within
19 the Agency since then that would re-look at that and
20 come to a different technical basis or confirm that
21 basis?

22 In other words, within Staff, has this
23 been re-looked at computationally?

24 MR. THOMAS: Dr. Compton?

25 MEMBER CORRADINI: So let me take it as

1 somebody who is against it.

2 So if were against all of what we're
3 talking about, I'd say 0396 is still acceptable and
4 unless you show me a technical calculation that says
5 that as I reduce the thermal power of the machine,
6 0396 becomes too conservative, I don't abide that.

7 Has there been any sort of analysis like
8 that since 0396?

9 DR. COMPTON: There certainly had been
10 calculations of -- I'm not speaking within the NRC --
11 but there have been calculations saying that if you
12 have reduced source terms, if you can show you have
13 reduced source terms, your dose distance curves are
14 going to come in closer. And I think that's the
15 principle.

16 I'll go back right now to a few things on
17 source term. First off, clearly it's an assumption of
18 the methodology that you have adequate information of
19 source terms and also in frequencies if you're dealing
20 with beyond design basis space.

21 That's just an assumption. What we did is
22 we had looked at NUREG-0396 and did a critical review
23 of the document and how they came up with it. And
24 it's fairly clear that they did two lines of approach.

25 They looked at the existing safety

1 analysis reports, about 70 of them at the time, and
2 then they did some scaling and they did some
3 calculations to figure out where you would get doses
4 exceeding 1 rem without really thinking of the
5 frequency.

6 They just took the worst-case DBA LOCA.
7 Then they also did another line of evidence which was
8 more PRA-based, which is where they were looking
9 beyond the siting, that single site source term. But
10 then they considered the frequency of the accidents.

11 That's why as we're writing, as we're
12 trying to come up with this methodology, we're trying
13 to be very general and recognize the different
14 designs. Different Applicants may want to use
15 different strategies.

16 MEMBER CORRADINI: So, you actually were
17 helpful. So, if tomorrow Joe's Reactor -- I didn't
18 mean it the way it sounded. It came out wrong, I
19 apologize.

20 But if tomorrow Joe's Reactor, LLC came to
21 you and said we're new to the game but we think we've
22 got the greatest machine since sliced bread but we
23 need a methodology to start thinking source terms,
24 would you point at the 0396?

25 Is that the only thing out there that you

1 point them to in terms of a methodology that they
2 could exercise their thinking process with?

3 DR. COMPTON: For source term, no, and
4 this is kind of a point, and back when 0396 was
5 developed, they used existing information on source
6 terms. They used the existing safety analysis
7 reports, they used the PRA that they had which was
8 WASH-1400.

9 And given that, one can look and see what
10 is the effect of those source terms on a particular --
11 to get doses out, what effect would it have on an EPZ
12 size? But those documents are not going to tell you
13 how to do the source term.

14 For this methodology, that's an assumption
15 that you can come up with this. Without trivializing,
16 yes, that's a hard problem.

17 MEMBER KIRCHNER: Pragmatically, I'm
18 thinking through a JM Applicant coming in. On paper
19 I'm going to have a PRA.

20 We expect it's the Commission statements
21 and policy that they expect these new designs to have
22 enhanced safety and that can be manifested in a number
23 of ways, lower frequencies.

24 But the question is that early in the game
25 how uncertain are you about the PRA numbers that are

1 presented? Because if you're going to entertain
2 frequency, then you're going to entertain that with a
3 large degree of uncertainty early in the design.

4 And yet, you'll want an early site permit
5 for one of these reactors. So, how do you swear the
6 difference so to speak? I see that as very
7 problematic for advanced designs that are not very
8 mature, to enter into the frequency arguments.

9 Because they're probably going to say the
10 CDF is 10 to the -7 or -8 so we don't have severe
11 accidents. That was not the approach that was taken
12 in 0396. They recognized that you could have a severe
13 accident.

14 They didn't do it on a frequency basis,
15 they just presumed that you could have a severe
16 accident.

17 DR. COMPTON: They did presume that you
18 could have a severe accident but then those were again
19 weighted by the frequency, they had frequencies from
20 the PRAs.

21 But, yes, they did not screen for that
22 particular analysis, they didn't screen out any of the
23 sequences.

24 MEMBER CORRADINI: They didn't screen out.

25 MR. COSTA: This is Arlon Costa.

1 Let me add a bigger picture because from
2 0396 we also recognized that the numbers that were
3 picked out by the EPA PAGs, the 1 rem number, were the
4 trigger point for all the other things that you have
5 to do after an accident happens, and the accidents
6 that you were talking about that Keith mentioned
7 there.

8 So there's an advantage for emergency
9 preparedness being in this situation because you're
10 thinking about the big picture. But you can backtrack
11 from it.

12 You still have to do the analysis that you
13 were talking about but at least for the purposes of
14 public protection, we use those same trigger points,
15 the 1 rem number, where all these things have to be
16 considered for the accident sequences to be evaluated
17 from the licensee standpoint and bring that analysis
18 to us.

19 And in the EP we're concerned about public
20 protection and we feel that is a very safe number, not
21 only because we have looked at it from 0396 but we're
22 imposing or putting it in the rule now.

23 MEMBER KIRCHNER: I have no problems with
24 the PAGs. I'm just curious as to how you're going to
25 evaluate this.

1 It seems to me a very complicated
2 undertaking to do a source term for a wide spectrum of
3 accidents and then evaluate the quality of the PRA,
4 which is where the frequencies are coming from and the
5 main sequences, and then come up with -- would it not
6 be more prudent for the Agency to just come up with a
7 new definition based on just 0396, just scale with the
8 source term?

9 CHAIRMAN BLEY: I'm going to interrupt at
10 this point. You've got a sense that some Members have
11 an area of concern and we would like to revisit it
12 later. I'm going to correct a little bit.

13 When we were talking Clinch River, Arlon
14 said that's under the current licensing. Yes, but
15 it's an exemption, which they have to justify. And
16 we'll be looking at that later.

17 MR. COSTA: And they are looking at the
18 PAGs, the 1 rem number, for the boundary EPZ that
19 they're looking for, properly so.

20 CHAIRMAN BLEY: I'm ahead. I'll wake him
21 up and go ahead again.

22 MR. THOMAS: Well, it's not going by.
23 When you started this conversation, it was on Slide 9,
24 it was talking about 0396.

25 Well, you guys really jumped forward in

1 our presentation to Slide 10, not a whole lot but I
2 was going to talk to -- Keith already did.

3 You guys have talked about what we were
4 going to talk to about this slide.

5 Part of the rulemaking process was to
6 engage research to get the subject-matter experts over
7 there to do the analysis to look at for the Agency
8 whether 0396, of course, could be applied to small
9 modular reactors and other new technologies.

10 Because the premise there was it was
11 written based on large light-water reactors that were
12 operating in the '60s and '70s.

13 So, we engaged Dr. Compton over there to
14 do the analysis for us. He quite eloquently talked
15 about the analysis that he did. It's still ongoing,
16 his analysis that we're doing is still ongoing.

17 So, Slide 11, please. This is where we're
18 talking about the ingestion response planning.

19 Earlier and elsewhere in the documents, we
20 clearly and decidedly said we're not including a
21 predetermined zone for ingestion planning within this
22 rule. And this slide tries to address why we, the
23 Staff, feels this is an appropriate approach when
24 doing so.

25 So the NRC is proposing ingestion response

1 planning requirements instead of a set distance as
2 part of a performance-based framework.

3 The proposed rule would require licensees
4 to comply with Section 50.160 to describe in their
5 emergency plan the licensee's state, local, travel, or
6 Federal resources for emergency response capabilities
7 to protect against contaminated food and water from
8 entering the ingestion pathway.

9 The concept of an ingestion pathway
10 emergency planning zone was created in the 1970s when
11 there may not have been a sufficient infrastructure to
12 support the identification or removal of
13 radiologically contaminated goods from the food chain.

14 Our primary concern in the 1970s were the
15 livestock and food products that could be contaminated
16 from a radiological release at a large light-water
17 reactor.

18 Since the 1970s, there have been I guess
19 improvements in the Federal and state capabilities to
20 identify and remove from the food chain biologically
21 and radiologically contaminated foods or produce. All
22 of the response actions are long-term issues.

23 Some immediate precautionary actions could
24 be taken prior to a significant release occurring.
25 For example, state and local authorities could

1 instruct individual farmers to wash garden products
2 and to place livestock in fields on stored feed.

3 State and Federal authorities frequently
4 use similar precautionary actions to implement
5 quarantines or embargoes for non- radiologically
6 contaminated foods.

7 Further, Federal resources are available
8 upon request to state, local, and travel response
9 through any nuclear radiological incident, including
10 no notice of incidents.

11 Federal resources that are available for
12 radiological emergency response include the Federal
13 Radiological Monitoring and Assessment Center, the
14 advisory team for environmental food and health, as
15 well as sampling and testing laboratories.

16 Through notable incidents documented by
17 the Center for Disease Control and Prevention that
18 demonstrate the capability to conduct large-scale
19 quarantines for the multi-state outbreaks of E.Coli,
20 infections from spinach in 2006, a multi-state
21 outbreak of salmonella associated with eggs in July
22 2010, multi-state outbreak of fungal meningitis and
23 other infections in October 2012.

24 In each case, the success quarantine and
25 removal from public access of contaminated food and

1 water products in response to biological contamination
2 demonstrates that a response to prevent ingestion of
3 contaminated foods and water could be performed in an
4 expeditious manner without a predetermined planning
5 zone.

6 Unlike biological contamination, the cause
7 is widespread illnesses and only discovered days after
8 infection, a radioactive accident is a leading
9 indicator that long-term actions to protect against
10 ingestion should be considered.

11 Next slide, please. This slide addresses
12 the existing offsite national level emergency
13 preparedness. These programs are managed by FEMA, our
14 Federal partner, who are in attendance today. I see
15 several FEMA faces here.

16 They're waving at me; hi, guys. For all
17 communities in the United States, the National
18 Preparedness Goal allows for a scaled and coordinated
19 response to any emergency.

20 The implementation and review of the
21 frameworks considered effective practices and lessons
22 learned from exercises and operations as well as
23 pertinent new processes and technologies.

24 These technologies enable the nation to
25 adapt efficiently to the evolving risk environments

1 and use data relating to a location, context, and
2 interdependencies, allowing for effective integration
3 across all missions using a standard spaced approach.

4 The mission areas on the slide represent
5 a spectrum of activities that are highly
6 interdependent and there is regular coordination among
7 the Departments within FEMA and inter-agencies working
8 to prevent, protect against, mitigate, respond to, and
9 recover from all threats and hazards.


10 Next slide, please. On this slide, we
11 briefly discuss the existing EP requirements for
12 nuclear power plants, as I said briefly. The existing
13 EP requirements for nuclear power plants and
14 production utilization facilities are found in Part 50
15 of the regulations.

16 The regulations in Section 50.47 provide
17 the EP requirements for nuclear power reactors
18 including planning standards for onsite and offsite
19 emergency response plans. These regulations took
20 effect in 1980 after the Three Mile Island accident.

21 Appendix E identifies the specific items
22 required to be included in the emergency plans. These
23 regulations took effect in 1970 and were last updated
24 in 2011.

25 Other relevant regulations include Section

1 50.33, the contents of the applications, Paragraph
2 (g). So that's the 50.34, technical content of
3 applications, Section 50.54, conditions of license
4 paragraphs (q), (s), and (t).

5  CHAIRMAN BLEY: Kenneth, a quick question.
6 Most of the guidance document is focused on, or a
7 great bulk of it, on content of the emergency plans.

8 MR. THOMAS: Yes, sir.

9 CHAIRMAN BLEY: I haven't done the
10 side-by-side comparison with 50.47 Appendix E but
11 isn't most of the emergency plan the same as in the
12 past or are there many changes?

13 MR. THOMAS: There's a considerable amount
14 of changes from what we have in the current guidance,
15 NUREG-0654, FEMA Rep. 1, that's a joint document, and
16 the content and structure of Draft Regulatory Guide
17 1350.

18 Where NUREG-0654, FEMA Rep. 1 tried to
19 identify capabilities or resources that should be
20 available to implement the planning standards in 10
21 CFR 50.47, Paragraph B, if you look at the structure
22 of the NUREG 0654, the planning standards A-16, JM
23 whatever, must align with the 16 planning standards in
24 Paragraphs 50.47(b) 1 through 16.

25 CHAIRMAN BLEY: Pardon me.

1 MR. THOMAS: So we looked at 50.47(b) and
2 its alignment with NUREG-0654 and those were captured
3 for the evaluation of emergency plans, and as
4 stipulated in the NUREG-0800 standard review plan.

5 What we did here is we drafted Section 160
6 and we said, okay, let's line up a similar guide for
7 Applicant who are going to come in for a permit
8 application or a license application for the various
9 parts, and they need to be able to submit in their
10 application an emergency plan that describes what
11 their emergency preparedness program is.

12 So there was a parallel that I used and
13 that's why I kind of point to what we have here,
14 50.47, in this corresponding guidance, what we did in
15 5160 or what we proposed to do in 5160, and its
16 proposed guidance as well.

17 And that's why we did that. We also
18 wanted to make sure that we had some kind of generic
19 or general guidance on how to develop a calculation or
20 analysis --

21 AUTOMATED PHONE MESSAGE: Please pardon
22 the interruption. Your conference contains less than
23 three participants at this time. If you would like to
24 continue, press star 1 now or the conference will be
25 terminated.

1 CHAIRMAN BLEY: Apologies again. If you
2 can capture the thread, keep going.

3 MR. THOMAS: Sorry for the interruption.
4 So, we wanted to contain general guidance for it to
5 assist the Applicant in submitting their application
6 for this.

7 So, I'm trying to keep it technology
8 inclusive. So that's why we had the preponderance of
9 the guidance speaking to the content of our emergency
10 plan, because that's our primary licensing document as
11 you will hear later on this afternoon.

12 CHAIRMAN BLEY: You gave good guidance in
13 a lot of detail.

14 MR. THOMAS: Thank you.

15 CHAIRMAN BLEY: We were looking for
16 something similar on the other side. We're near the
17 halfway point. I think one more slide and then it
18 looks to me like that's a good place for our break.

19 MR. THOMAS: I think so as well. So here
20 we go. I'm going to finish this one up. Next slide,
21 please.

22 The summarized recent rule-making
23 activities, as we mentioned earlier, with the
24 regulatory basis, the draft was issued in April 2017.

25 We had a public Meeting May 10th, 2017,

1 where we facilitated the public's ability to construct
2 public comments and submit those to us. We weren't
3 accepting comments at that Meeting. I'll be very
4 particular about how I say that.

5 As a result of the draft regulatory basis,
6 we got 57 public comment submissions on the draft
7 regulatory basis as we discussed earlier. NEI
8 supplied one comment to us but questioned about how we
9 were not addressing large light-water reactors and
10 operating reactors.

11 They felt that given the information in
12 draft reg, or at least how we interpret it, they felt
13 that it may be technology-inclusive enough to apply to
14 them.

15 Like I said before, the Staff initially
16 considered that to be outside the scope and we didn't
17 address that comment directly but upon concurrence of
18 the proposed rule package that we have going now, we
19 are reassessing that by including another opportunity
20 for the public to weigh in on the scope of the FRN.

21 MEMBER REMPE: So I have a question about
22 this document. The version I have says September 2017
23 but I guess that's the one that was issued November
24 2017.

25 But in there, and as well as in the draft

1 rule, you have a comment that says the NRC hasn't
2 issued a license for a commercial non-LWR facility for
3 construction or operations in Fort St. Vrain in 1973.

4 And maybe that's the way you guys refer to
5 things but since the NRC wasn't established until
6 after that, I'm kind of wondering if in the draft
7 rule, if you correct it, you ought to fix that
8 language?

9 MR. THOMAS: No, no, it's a valuable
10 thing. We did catch a couple of our anachronisms,
11 cell phones, riding horseback in the 11th century. I
12 tried to avoid that at all costs.

13 So, we did catch a couple of those and we
14 kind of face-palmed when we do that. So I appreciate
15 it, I will take note of it and we'll address it in our
16 published documents. We'll be happy to so I
17 appreciate that.

18 Key messages, no comments were received
19 that would alter the Staff's proposed approach in the
20 draft regulatory basis. The Staff reviewed all of the
21 comments, we binned them and then we addressed the
22 meter on the final regulatory basis, or we deferred
23 their resolution for the proposed rule and proposed
24 guidance.

25 And then we also, as we were instructed by

1 the Commission, worked very closely with the
2 decommissioning or the transitioning into
3 decommissioning for nuclear power plant rulemaking
4 that's currently in front of the Commission.

5 And we tried to apply those lessons
6 learned as we went through. In fact, there were
7 several Members on our Working Group that also were
8 Members of that Work Group. There were several
9 different themes. We addressed those as well.

10 The definition of small modular reactors,
11 that's one of those action items that we included in
12 the proposed rule.

13 Consequence-based approach for the sizing
14 of the emergency planning zone and the need for a
15 co-location discussion which is how we're addressing
16 or using hazard analysis to talk about multi-module
17 events and the co-location.

18 And the sum total is that we issued the
19 final regulatory basis in the fall of 2017.

20 CHAIRMAN BLEY: Thank you. At this time,
21 I think we'll recess until 20 after. We're going to
22 start promptly at 20 after. See you back here then.

23 (Whereupon, the above-entitled matter went
24 off the record at 10:01 a.m. and resumed at 10:19
25 a.m.)

1 CHAIRMAN BLEY: The Meeting will come to
2 order. And Patricia, you're going to start?

3 → DR. HOLAHAN: Yes. I'd like to just
4 refocus us on this is an EP rule going forward. We'd
5 like it to be published for public comment and the
6 source term will be already addressed through the
7 siting and licensing process.

8 And Bob may want to add something but
9 we're focusing on the emergency preparedness aspects,
10 not the source terms specifically.

11 MR. TAYLOR: I'm Robert Taylor, Branch
12 Chief of NSIR. Very good interesting conversation
13 that was just prior to the break.

14 We do want to emphasize that this is the
15 emergency preparedness rule-making for small modular
16 reactors and other new technologies and our guidance
17 is based upon the information that would be available
18 at the time the Applicant would be providing us with
19 their emergency plan content based upon that guidance,
20 which would include the EPZ size.

21 And we provided some guidance on how to
22 make that determination on our EPZ size utilizing the
23 methodology that had been researched on NUREG-0396.

24 So, during the licensing process, all the
25 discussion we've had, those kind of items would be

1 assumed to have already been determined and policy
2 decisions been made on it such that emergency
3 preparedness would be utilizing that information, the
4 Applicant would be utilizing that information in order
5 to make that EPZ size determination, similar to what
6 happened with NUREG-0396.

7 You're quite familiar, of course, that
8 they had the WASH-1400 document to be able to draw
9 from for the current fleet of operating plants.

10 Those kind of items would already be there
11 for the designs that were being applied for by the
12 Applicant, early site permits, already having that
13 parameter set for EPZ sizes on what the source term
14 would need to be.

15 It's divorced from that development, just
16 that it would need to plug in that this is what it
17 cannot exceed once those accidents are being
18 determined.

19 So, the emergency preparedness is a
20 general broad framework in order for small modular
21 reactors and new technologies based upon assumptions
22 that the licensing process, we would be part of that
23 licensing process, utilizing that information that
24 would already be available at the time.

25 So I just wanted to try to talk to the

1 emergency preparedness program is not where we have
2 included in the scope a determination of how to create
3 that source term.


4 That is something that would be part of
5 another piece of the licensing process.

6 CHAIRMAN BLEY: Do I hear any
7 protestations? You'll probably hear this from us
8 again. Go ahead.

9 MR. TAYLOR: I'm just trying to delineate
10 the scope of the rule-making itself.

11 CHAIRMAN BLEY: I understand.

12 DR. HOLAHAN: So, Kenny, we'll turn it
13 back to you.

14  MR. THOMAS: Okay, welcome back.

15 Up to this moment, we talked about some of
16 the policy and some of the considerations that the
17 Work Group, the technical issues for the Work Group,
18 are addressing within this rule.

19 On the next slide, Slide Number 15, we
20 have a diagram that provides the overall structure of
21 the rule and this relationship to the existing EP
22 regulations.

23 We've already used the performance-based
24 rule and the Applicant would need to specify in
25 application which approach the licensee would use.

1 The options are the existing EP regulations or the
2 performance-based regulations over in 10 CFR 50.160,
3 or the proposed Section.

4 In the following slides I will present the
5 specific changes to Sections 50.33, 34, 47, 54, and
6 the new Section, 160.

7 For conforming changes elsewhere in the
8 regulations are proposed to allow for an Applicant or
9 a licensee to use either of the existing EP
10 regulations or the new set of regulations in Section
11 160.

12 I'll draw your attention now to the bottom
13 or lower right-hand corner of the slide. The
14 Applicant would have to provide an analysis to support
15 the specific EPZ size.

16 If the Applicant demonstrates that a side
17 boundary EPZ is appropriate, then the regulations in
18 Paragraph (c1)IV(b) would not apply to the licensee.

19 If the emergency plan would extend beyond
20 the site boundary, then the Applicant would need to
21 address the requirements in C(1)IV(a) and (b) of the
22 proposed rule.

23 The Staff would then need to re-engage our
24 friends over at FEMA for a review of the offsite plan
25 submitted as part of the licensed application or

1 permit application as appropriate.

2 There is guidance in the Draft Regulatory
3 Guide to support the implementation of the
4 performance-based regulations.

5 Next slide, please.

6 In Section 50.2, the Staff is proposing
7 adding three definitions, one for a non-light-water
8 reactor means that nuclear power reactor using a
9 coolant other than light water, non-power production
10 or utilization facility means a non-power reactor
11 testing facility or other production or utilization
12 facility licensed under Section 50.21(a), Section
13 50.21(c), or Section 50.22 that is not a nuclear power
14 reactor fuel reprocessing plant.

15 This definition aligns with the non-power
16 production or utilization rule. Small modular reactor
17 means a power reactor as defined in 10 CFR 100.3
18 licensed to produce heat energy up to 1000 megawatts
19 thermal, which may be a modular design as defined in
20 10 CFR 52.1.

21 In the rule, we used the explicit language
22 for the facilities, although for convenience, while
23 I'm speaking I will continue to use other than new
24 technologies, having Dr. Skillman's comment from
25 earlier about the use of ONT in the ruling guidance as

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1 well. I made a note of that.

2 In Section 50.33, this proposed rule would
3 revise Paragraph (g) to construct two sub-paragraphs,
4 (g) (1) and (g) (2), which would allow for the Applicant
5 to select which EP regulations the licensee would
6 meet.

7 Additionally, paragraph (g) (2) would
8 establish an EPZ size determination process for small
9 modular reactors and other new technology for
10 Applicants to comply with Section 50.160. We will
11 discuss this further in a few minutes.

12 In Section 50.34 of this proposed rule, we
13 would revise paragraphs (a) (10) and (b) (6) IV to require
14 small modular reactors and other new technologies
15 described in their preliminary safety analysis report
16 or final safety analysis report as appropriate to the
17 application and the plans for coping with emergency
18 based on the requirements in either Section 5160 or
19 Appendix E to Part 50.

20 Next slide, please. Section 50.47, this
21 proposed rule would remove and reserve Paragraph
22 (C) (2). Paragraph (f) denoting the offsite remaining
23 response plan requirements in Section 50.47 (b) do not
24 apply when the EPZ is entirely within or at the site
25 boundary.

1 This aligns with the proposed changes to
2 the transition to the decommissioning rule that's
3 before the Commission.

4 In Section 50.54, this proposed rule would
5 add a new subparagraph (Q)(7) but would contain the
6 details for submitting license amendment requests for
7 small modular reactors and other new technology
8 licensees implementing the associated plan changes
9 necessary to meet the requirements in Section 50.160.

10 The Staff proposes revising Paragraph
11 (s)(3) to add clarification that if the standards
12 apply to offsite emergency response plans or with the
13 planning activities in the new Section 5160(c)(1) IV(b)
14 apply, then the NRC will base its reasonable assurance
15 findings on a review of FEMA's findings and
16 determinations.


17 This proposed rule would also revise the
18 paragraphs in these Sections to include conforming
19 changes for a small modular reactor and other new
20 technology for Applicants to use the Section 50.160 as
21 applicable.

22 Next slide, please. The following slides
23 provide the details of the Staff's proposed rule.
24 This proposed rule would add Section 5160, which would
25 contain the alternative EP requirements for small

1 modular reactors, non-light-water reactors and non-
2 power-production or utilization facilities.

3 Paragraph (a) is the applicability.
4 Summarizing that paragraph, Applicants or licensees
5 that elect to use Section 51.60 must comply with the
6 requirements of this Section for the contents of their
7 emergency plans.

8 (B) is the definition. We have one new
9 definition here, although, you've seen it elsewhere in
10 10 CFR 20.1003 for a site boundary.

11  MEMBER KIRCHNER: Could you just clarify,
12 does that equal the exclusion area boundary?

13 MR. COSTA: No, it does not.

14 MEMBER KIRCHNER: So the site boundary
15 is...what's the distinction?

16 MR. COSTA: Basically, the site boundary
17 is what is owned by the licensee and the exclusion
18 area is a calculation using the source terms.

19 MEMBER KIRCHNER: They may be or may not
20 be the same?

21 MR. COSTA: They may or may not be the
22 same.

23 MEMBER KIRCHNER: Okay.

24 MR. THOMAS: Next slide, please.
25 Paragraph (c) are the requirements. The emergency

1 planning shall contain the information needed to
2 demonstrate compliance with the elements set forth in
3 this paragraph.

4 The NRC will not issue an initial
5 operating license to a licensee unless a finding is
6 made by the NRC that there is reasonable assurance
7 that adequate protective measures can and will be taken
8 in the event of a radiological emergency.

9 No finding under this Section is necessary
10 for an assurance of a renewed power reactor operating
11 license.

12 Paragraph 1 is the performance-based
13 framework. The licensee must demonstrate effective
14 response in drills and exercise for emergency and
15 accident conditions.

16 The Draft Regulatory Guide 1350 simply
17 states Section 50.60 requires licensees to demonstrate
18 effective response in drills and exercises for
19 emergency and accident conditions.

20 I, maintenance and performance, the
21 licensing must maintain in effect preparedness to
22 respond to emergency and accident conditions and
23 describe in an emergency plan the provisions to
24 re-employ to maintain preparedness.

25 Essentially, the Applicant needs to

1 describe the process of running drills and exercises,
2 critiquing its performance, implementing corrective
3 actions to improve its performance, and develop the
4 metrics to measure their effectiveness in maintaining
5 their preparedness.


6 The guidance for the emergency plan is it
7 should contain a general description of the facility,
8 any site-specific definitions, any relevant
9 appendices, drawings, diagrams, and other information
10 needed to demonstrate compliance with this Section.

11 The emergency plan should describe the
12 process for maintaining and making changes to the
13 emergency plan and associated procedures, including
14 methods to account for facility changes and methods
15 used to conduct independent reviews of the EP program.

16 Next slide, please.

17 MEMBER SKILLMAN: Question, please?

18 MR. THOMAS: Yes, sir?

19  MEMBER SKILLMAN: This is a topic that has
20 been debated very thoroughly around this table after
21 Fukushima and it has to do with changes that get made
22 off site.

23 So here we have the site, nice, tight
24 site, the site demonstrates by and large that its
25 emergency planning conditions and its releases are

1 fairly well described by the site boundary and we end
2 up with an emergency plan that the relevant
3 authorities and the licensee agree to.

4 And then there are major changes in the
5 area whereby the emergency plan probably needs to be
6 adjusted. How is that potential change factored into
7 the new 50.160?

8 MR. THOMAS: That's a great question.
9 Could you go to Slide 28, please?

10 MEMBER SKILLMAN: I'm looking for the word
11 contemplated or actual changes wrapped in that
12 paragraph.

13 MR. THOMAS: They're not in that
14 paragraph.

15 (Simultaneous Speaking.)

16 MEMBER SKILLMAN: -- the question, okay.

17 MR. THOMAS: So the words that you were
18 looking for again?

19 MEMBER SKILLMAN: Actual or contemplated
20 changes. So, everybody is happy to put a hospital
21 right on the property line, everybody's happy to put
22 a large school right on the property line.

23 I know it's nuts but the issue that we
24 dealt with in months following Fukushima as we sat
25 around the table is how can we handle the changes in

1 the locality that affect how we see the licensed
2 acceptability of this?

3 MR. THOMAS: Well, the 5054(2) just kind
4 of mentions it's part of the change process but if
5 it's not being proposed by the licensee, it's not
6 necessarily going to be analyzed.

7 One of the interesting parallels between
8 what you just said is similar to the resources working
9 with IAEA small modular reactors regulators was that
10 Great Britain has different zoning laws, which they
11 are able to immediately tackle this as part of their
12 nuclear reactor safety regulations.

13 They talk about how the licensee and the
14 community action monitors to maintain a low population
15 zone for their facility. So what I can do is go back
16 and take a look at that. I made a note of your
17 comment and I can go back and look at that.

18 But quite clearly, those words are not in
19 this but this regulation is intended to be continually
20 assessed. It's not just once that you do for siting
21 and then not going on.

22 The licensee should be aware of, hey,
23 there's a new transportation hub or a new industrial
24 facility that's going to be put into place near here.
25 They need to go back and re-evaluate the hazard

1 analysis.

2 MEMBER SKILLMAN: If the words continually
3 assessed were to be endowed, I think it is accurate to
4 communicate that what we've come up against was the
5 motion of finality, which we all understand very
6 clearly.

7 Once the permit's been granted, it's fine,
8 and so that raises the question, what happens when
9 there's a change? How final is final? Does something
10 need to be reassessed?

11 Hence the words that you just used. Since
12 this is new rule-making, those words might just be the
13 right thing at the right time as we looked at ONTs and
14 as we looked at Carpin SMR and Ravenswood across the
15 East River from the United Nations, a site that was
16 once considered in 1964.

17 I'm just saying.

18 MR. THOMAS: That's a good point. We are
19 going to take a note of it, sir.

20 MEMBER SKILLMAN: Thank you.

21 MR. TAYLOR: This is Bob Taylor, Branch
22 Chief of NSIR DPR. Your question was very well taken.
23 It does go back to the 54(q) regulation that talks to
24 having a plan in place and the furtherance of 54(q),
25 it talks to maintain the effectiveness of the plan.

1 I think this is a possibility to try to
2 clarify what that continuous observation is of all the
3 factors that would impact the plan, be it on site or
4 off site, even if you have a site boundary EPZ, that
5 you would need to have that in consideration at all
6 times. And the licensee needs to be made aware of
7 that.

8 But that is the intent of that statement
9 about maintaining the effectiveness of the plan, it's
10 not just if you make a change to the plan. You have
11 to make sure that the change maintains effectiveness
12 of the plan with the change.

13 It also means outside influences if the
14 plan as written doesn't get changed, what does that do
15 to the effectiveness of the plan? So instead of a
16 change, it needs to be initiated from that offsite
17 impact.

18 MEMBER SKILLMAN: I think what's missing,
19 at least from my perspective, is the trigger
20 statement. Something that communicates and, oh, by
21 the way, you can't just let this sit for 10 or 20 or
22 30 years.

23 There needs to be a trigger at some point
24 in time, when you go back and you take an official
25 look, and you formally document what we assumed before

1 remains sound today for there have been some changes
2 and we're going to assess those changes and we're
3 going to give a report in 90 days or whatever it is,
4 and then if we need to make adjustments, particularly
5 to our emergency plan, we will.

6 CHAIRMAN BLEY: I'm going to back up what
7 Dick is saying a little bit.

8 We've run into, in this room, both from
9 Staff and from holders of licenses completely
10 divergent arguments on this issue from here's the
11 quarter part of the regulation, when you need to do
12 this, to nobody does it, we don't do it, to Applicants
13 and licensees who say, yes, we do that all the time.

14 It's not consistent throughout the Staff
15 and throughout our regulated people. It would be nice
16 to make it clearer.

17 (Simultaneous Speaking.)

18 MR. TAYLOR: -- Committee Members is this
19 is in opportunity to possibly take a look at that.

20 MEMBER SKILLMAN: You're proposing new
21 regulations. This is the time to catch it is my
22 point. Thank you.

23 MR. THOMAS: Thank you, Dr. Skillman.
24 Return us, please, I think back to Slide 20. Did I
25 skip number 19? Good, that's what I thought.

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1 Performance indicators, the process used
2 to develop performance indicators for each emergency
3 response function in (c)(1)III, including the
4 methodology used to develop the indicators, the basis
5 for relying on the indicators, and how acceptability
6 or successful achievement is determined.

7 In the guidance the Staff provided for an
8 example for the methodology to develop the premise
9 indicators is a quotient, a percentage quotient,
10 number of correct opportunities over the number of
11 total opportunities.

12 Next slide, please. Further, parts of the
13 performance-based framework and the things that we're
14 expecting the Applicant and licensees to be able to
15 demonstrate. I'm not going to read each and every one
16 of these to you. It could get kind of boring.

17 So here we go. At the top of the list we
18 have vent classification and mitigation, assess,
19 classify, monitor, and repair facility malfunctions in
20 accordance with the emergency plan and return the
21 facility to safe conditions.

22 Part of this is not getting into the ops
23 or maintenance or engineering procedures, it is in
24 accordance with the emergency plan for staffing,
25 making sure you have the right individuals identified

1 to be able to perform these.

2 And then using those individuals to
3 actually perform, it's not getting into the ops,
4 maintenance or any of those other procedures.

5 Protective actions, plants should maintain
6 protective actions for onsite personnel for emergency
7 conditions, recommend protective action to offsite
8 authorities as conditions warrant.

9 Communications, establish and maintain
10 effective communications with the emergency response
11 organization and make notifications to response
12 personnel and organizations who may have
13 responsibilities for responding during emergencies.

14 Command and control, establish and
15 maintain effective command and control for emergencies
16 by using the supporting organizational structure with
17 defined roles, responsibilities, and authorities for
18 directing and performing emergency response functions
19 as described in Paragraph (c) of the Section.


20 So particularly for the command and
21 control, when we took a look back at the near-term
22 taskforce, command and control was one of those
23 concerns from Fukushima Daiichi.

24 Among the other ones that we have on here
25 are staffing and operations, radiological assessment,

1 radiological conditions underneath that, protective
2 equipment for radiological assessment, core and vessel
3 damage and releases for radiological conditions.

4 We also have one for re-entry and one for
5 critique and corrective actions.

6 Yes, sir?

7  CHAIRMAN BLEY: I'm going back to where I
8 started. The last time you asked the question you
9 pointed to I think some guidance that's occurred over
10 the years and other documents that have led to the
11 things you're incorporating in 160 but are not, I
12 think he said, in Appendix E.

13 Now, most of these things are in Appendix
14 E in one form or another. I hate to ask it this way,
15 the way you're writing 160, is that the way one might
16 think Appendix E ought to be revised?

17 I'm not suggesting you ought to run off
18 and revise Appendix E right now but the impression I
19 got from what you said earlier is these are things
20 that have been adapted into the guidance for meeting
21 Appendix E that will now be part of 160.

22 Am I misinterpreting?

23 MR. THOMAS: No, sir, I don't think you're
24 misinterpreting it, and by the way, Bob, I need more
25 money for my project.

1 MR. TAYLOR: No problem, Kenny, it's on
2 its way.

3 MR. THOMAS: Okay, so the ACRS says that
4 -- Dr. Bley, I think the approach that we took was
5 emergency management is emergency management so there
6 should be a great number of parallels between what you
7 see in any emergency response framework.

8 CHAIRMAN BLEY: I would think so.

9 MR. THOMAS: Exactly.

10 So the similarities between what we see in
11 Section 5160 may be very similar to what you see in
12 Appendix D and 50.47 but then also very familiar with
13 what our friends over at FEMA put out for the national
14 planning frameworks.

15 Emergency management and this is emergency
16 preparedness as a portion of emergency management.
17 There's no crystal ball on this. What we did do is
18 construct Section 5160 in what I would say the
19 importance, and again, the emergency classifications
20 mitigations at the top of the list.

21 That's where we get started for our
22 licensee or an Applicant. Corrective actions, we have
23 to protect our individuals.

24 When we first started looking at this, we
25 looked at the significant determination process and in

1 our document we have risk-significant planning
2 standards, the four that we currently have under
3 50.47.

4 I said, well, I'm going to move those to
5 the top of my list because those are the ones that are
6 the most important to us currently and what's really
7 important for everybody else.

8 So good emergency management is good
9 emergency management. There are parallels, I'm glad
10 you're not asking me to go out and revise Appendix E,
11 I think that would be fraught with a lot of other
12 things that I don't really want to address.

13 This is an opportunity for us to write the
14 new rules to take another look at what's really
15 applicable to small module reactors and other new
16 technologies and that's where we constructed this
17 framework the way we did.

18 CHAIRMAN BLEY: So let me ask a little
19 differently because I don't see the difference between
20 the LWR here and the SMR for this kind of thing.

21 If we didn't have an Appendix E in 50.47
22 and we were going to write one tomorrow, I'm thinking
23 we'd write it kind of the way you're trying to write
24 160. That's Working Group.

25 Do you agree?

1 MR. TAYLOR: If I can? Again, Bob Taylor.

2 CHAIRMAN BLEY: I'm not suggesting we do
3 that, I'm trying to understand why there would be a
4 difference in principle.

5 MR. TAYLOR: What we found is, and I'll
6 have to congratulate the authors of Appendix Echo at
7 this time because they incorporated into Appendix Echo
8 all the core principles of emergency preparedness.

9 They also did that in 10 CFR 50.47 Bravo
10 and those stand today and it has been validated by the
11 fact that our partners at FEMA have established core
12 capabilities.

13 And whenever we start to align those core
14 capabilities in the current national response
15 framework that's currently existing in Appendix Echo,
16 5047 Bravo, they are matched well such that all of
17 those core capabilities of today are found within
18 Appendix Echo and as a result, also in 160.

19 So we're following suit with what's
20 happened not only in the past but what's the current
21 principles of good emergency management.

22 So, when you're asking would we rewrite
23 Appendix Echo to mimic 160, I would say we would be
24 rewriting Appendix Echo to match what the current
25 level of emergency management principles are today,

1 which is already found in the Appendix Echo in 160.

2 So, yes, that would be something that
3 would follow the logic principle.

4 CHAIRMAN BLEY: So let me try one last
5 time. Is there any technical reason why there should
6 be a difference between emergency planning other than
7 the size of the EPZ perhaps for the SMRs and for the
8 OWRs?

9 MR. TAYLOR: To answer that question, we
10 would have to take a deep dive into the Appendix Echo
11 and we did not do that in the scope of this
12 rule-making.

13 I'll be honest about that in that that has
14 been brought up, the Working Group has approached that
15 but what we're saying is that's one of the reasons for
16 the questions, because if that were true, we would
17 want to give that assessment and an analysis as part
18 of the rule-making which we haven't done.

19 MR. COSTA: Dr. Bley, just to emphasize
20 the direction that we're going in the rule, in a
21 little bit Kenny is probably going to talk a little
22 bit more about the boundaries.

23 You're going to see that for the offsite
24 boundary, the whole Appendix Echo is part of that.
25 And when you're talking about the boundary, the inside

1 boundaries, we take advantage of the performance-based
2 approach that we have.

3 And you're going to see that some of the
4 requirements in Appendix X was brought in and some are
5 not necessary because of the size of the boundary does
6 not apply.

7 CHAIRMAN BLEY: Here's where I'm coming
8 from with everything I read in the rule and in the
9 guidance. It's all about how to do emergency
10 planning. I think that subsequently changed.

11 The real change is it might have a
12 different-sized set of boundaries and part of which is
13 that source term which allows you to do that.

14 So all of our focus is on the stuff that
15 isn't really changing much and we'll send somebody
16 else to be covering this other piece. And I don't
17 want to keep going on that.

18 MR. THOMAS: Let me (Simultaneous
19 Speaking.) Patricia Milligan.

20 DR. MILLIGAN: Hi, Patricia Milligan,
21 Senior Advisor of Preparedness and Response.

22 To get to your question, 160 is describing
23 a performance-based program which is going to be very
24 different than 5047 and Appendix E which describes a
25 more deterministic approach that would have to EP.

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1 So in order to keep them separate, the
2 criteria 160 is describing performance-based. So
3 that's why we're trying to do it a little bit
4 differently and call them out separately.

5 MEMBER CORRADINI: I think all Dennis is
6 asking is once ten miles becomes X miles, once that's
7 done, the procedure ought to be technically similar if
8 not identical. I think that's all you're asking.

9 CHAIRMAN BLEY: It is but she brings up
10 the point of what the performance criteria would be,
11 which is different.

12 DR. MILLIGAN: Which is different, yes,
13 and will look different. So I think that's an
14 important distinction and Kenny will probably talk a
15 little bit more about that when he gets the
16 opportunity to talk more about the performance-based
17 program.

18 MR. THOMAS: Let me give a
19 behind-the-curtain look. When the Work Group started
20 this process we started with the end in mind.

21 So one of our retirees, he's now since
22 retired, Steve Levine, who you are probably very
23 familiar with, he said no rule is good if you can't
24 write a contrary to statement.

25 So they illustrate the difference between

1 what would be contained in 50.47 or Appendix E in
2 today's rule and what we're proposing in Section 150
3 is the contrary to statement.

4 Contrary to statement for the current
5 regulations would be contrary to the regulation
6 50.47(b) where the licensee failed to maintain the
7 capability to perform whatever.

8 Here in Section 160, the contrary to
9 statement would be contrary to the requirements of the
10 5160(c)(1)III whatever, the licensee failed to perform
11 whatever.


12 (Whereupon, the above-entitled matter went
13 off the record at 10:51 a.m.)

14 CHAIRMAN BLEY: Thanks. That's good. I
15 think you can go ahead.

16 MR. THOMAS: I think I'm on slide 22 at
17 this point.

18 MEMBER SKILLMAN: Kenneth, let me ask you
19 a question.

20 MR. THOMAS: Yes.

21  MEMBER SKILLMAN: Back on the slide you
22 just presented, you identify an event classification
23 and mitigation.

24 MR. THOMAS: Yes, sir.

25 MEMBER SKILLMAN: I look at Draft Guide

1 1350, pages 9 and 10, and you provided some sample EAL
2 descriptions.

3 MR. THOMAS: Yes, sir.

4 MEMBER SKILLMAN: I'm stuck on the EALs
5 because I've lived a rich life being judged on how
6 well we executed EALs.

7 MR. THOMAS: Yes, sir.

8 MEMBER SKILLMAN: The ones that are
9 presented in Draft Guide 1350, I will read them:
10 abnormal radiological controls, external hazard and
11 natural phenomenon, system malfunction, fission
12 product barriers and judgment.

13 I will caution be certain that the EALs
14 are based on source term and radiological consequence
15 as opposed to administrative issues. For instance, at
16 one site we got to a site area emergency because of a
17 perceived intruder into a vital area. A security
18 issues.

19 I'm not saying for a millisecond that
20 security is not important but I'm not sure we ought to
21 get to a site area emergency in this procedure in
22 Draft Guide 1350. I think this ought to be a
23 radiological influence instead of guidance for the
24 industry.

25 If there are other reasons to escalate an

1 EAL, and security may certainly be one, it ought to be
2 somewhere else. Otherwise, I think it in tolerates
3 what you're trying to communicate here, or it somehow
4 affects the importance of the source-term arguments
5 that you are attempting to make in this Draft Guide.

6 I hope I haven't goofed up in my
7 communication. What I'm trying to say is there may be
8 a reason to get to a site based on security.

9 MR. THOMAS: Yes, sir.

10 MEMBER SKILLMAN: No doubt very important.
11 Highly important. I think what you're trying to drive
12 at here is with an SMR and an ONT you can have the
13 source term that is so very very low you may be able
14 to bring in your boundary. That has some very
15 important implementation as to where we might be able
16 to park an SMR. Security ought to be just as
17 important but it not ought to be hiding in these EALs
18 that are basically radiologically based.

19 MR. THOMAS: Yes, sir.

20 MEMBER SKILLMAN: Thank you.

21 MR. THOMAS: Point taken. Slide 22.
22 These are the planning activities. These planning
23 activities are for those activities that may be
24 impractical or even if you did measure them, those
25 measurements may not mean that much. These planning

1 activities are for all SMRs and ONTs, not just ones
2 that are situated for onsite and offsite.

3 (iv) Planning activities. The licensees
4 must be capable of -- this is where we have the
5 capabilities -- preparing and issuing public
6 information during emergencies.

7 Were you able to coordinate with the
8 public information with federal, state, local, or
9 tribal officials to make sure that if you have
10 declared emergency and the sirens and the fire trucks
11 or whatever, are you able to adequately notify the
12 public what's going on.

13 Implementing the NRC-approved emergency
14 response plan in conjunction with the licensee
15 safeguard contingency plan. Can you implement both at
16 the same time.

17 Next slide, please. Onsite for voice
18 communications with the NRC. There's no surprises
19 there. When you have an emergency we want you to be
20 able to notify us and do you have the capabilities to
21 be able to do so.

22 Establish an emergency response facility
23 from which effective direction can be given and
24 effective control can be exercised during an emergency
25 with capabilities to support emergency response

1 functions described in Paragraph C. In the emergency
2 plan it should describe the facilities; location,
3 capability, size, equipment, backup locations if it's
4 needed.

5 MR. COSTA: Dr. Bley, in this slide here
6 -- this is Arlon Costa again -- where the
7 incorporation of Appendix E is coming into this rule
8 for the performance base, part of it, as Kenny has
9 demonstrated here about voice communication, about
10 emergency facility. You are going to see a slew of
11 things like that from the experience as a baseline.

12 CHAIRMAN BLEY: I can find everything over
13 here.

14 MR. COSTA: Okay.

15 CHAIRMAN BLEY: In fact, I can't find
16 anything here, and if you have one as we go through
17 that wouldn't apply to an LWR, say this one really
18 doesn't apply to an LWR. But go ahead.

19 MR. THOMAS: Challenge accepted. The four
20 next slides describe the planning activities for those
21 facilities that have an EPZ that extends beyond the
22 site boundary. These are the offsite planning.

23 Contacts and arrangements made and
24 documented with local, state, tribal, and federal
25 government agencies as applicable with

1 responsibilities for coping with the emergencies
2 including identification of the principal coordinating
3 agencies and coordinated reviews of changes in offsite
4 and onsite planning and preparation that may touch
5 tangentially to the other question about changes to
6 the offsite areas. This would be applicable to those
7 facilities that do have an offsite plan.

8 Offsite organizations responsible for
9 coping with emergencies and means of notifying in the
10 event of emergency, persons assigned to the emergency
11 organizations including the means of validating the
12 notifications and the time period by which the
13 notifications must be completed, and primary and
14 secondary methods of communicating the notification.

15 This is going back to our means of
16 notification, validation of the notification, time
17 within which the notifications need to be completed
18 and, of course, primary and secondary methods of
19 making those notifications.

20 Next slide, please. Protective measures
21 to be taken within the Emergency Planning Zone to
22 protect the health and safety of the public in the
23 event of an emergency including the procedures by
24 which the protective measures are implemented,
25 maintained, and discontinued.

1 There's a subtle difference here about
2 where it's discontinued. We don't currently require
3 that for large light-water reactors. Have a
4 description of where the protective measures could be
5 discontinued. Subtle difference.

6 No. 4. Site familiarization training for
7 any offsite organization that may respond to the site
8 given an emergency. We currently do that for large
9 light-water reactors. In the guidance in 1350 the
10 service-specific information concerning a site's
11 capability should be shared with the responding
12 service.

13 For example, the locations of important
14 fire mains, hydrants, suppression systems should be
15 provided to the fire response services if needed to
16 respond to the facility to assist in fire suppression
17 investigation. Likewise, for local law enforcement
18 and medical services, services should be aware the
19 capabilities of the site and the locations of key
20 resources.

21 CHAIRMAN BLEY: I'm just curious since you
22 pointed that one out --

23 MR. THOMAS: Yes, sir.

24 CHAIRMAN BLEY: -- even thought it's not
25 spelled out currently, if we reach the point that all

1 the stuff was gone, what happens if the staff
2 recommends to the Commission that we no longer need
3 emergency planning, how is it done? It's not spelled
4 out in the rule.

5 MR. THOMAS: You're talking about
6 termination of the event?

7 CHAIRMAN BLEY: No. This was for an event
8 here. I thought you meant --

9 MR. THOMAS: This is the capability to be
10 able to respond to an event.

11 CHAIRMAN BLEY: Yeah. And it's spelled
12 out when we no longer have to be able to do that. I'm
13 sorry. Go ahead. I'm slowing us down.

14 MR. THOMAS: That's all right.

15 An evacuation time estimate. The areas
16 beyond the site boundary but within the Emergency
17 Planning Zone.

18 Next slide, please. Offsite licensee and
19 any backup facilities from which the licensee
20 coordinates the licensee's response with the offsite
21 response. Kind of like the ELF ISH thing.

22 No. 7. The means of making offsite dose
23 projections and the means of communicating the offsite
24 dose projections to the offsite response coordinating
25 agencies.

1 No. 8. The means by which public
2 information is provided to the members of the public
3 concerns emergency planning information, public alert
4 notification system, and any prompt actions that need
5 to be taken by the public.

6 Here is where I would like to -- we had
7 another face palm, Dr. Rempe, where we had a small
8 discrepancy in the Draft Regulatory Guide where we had
9 guidance to implement an emergency response data
10 system that is required by 10 CFR 50.72(a)(4). There
11 is no requirement in Section 164 for emergency
12 response data system.

13 → MEMBER SKILLMAN: Why not?

14 MR. THOMAS: Because the requirement for
15 emergency response data system is actually located in
16 50.72(a)(4) for nuclear power reactors. If you are a
17 nuclear power reactor irrespective of where your EPZ
18 is, we're not changing this rule and you still have to
19 implement emergency response data system. I just need
20 to have a similar rule in EP to implement that rule.
21 It's already in there.

22 MEMBER SKILLMAN: Okay. Thank you. So
23 it's not precluded, it's just, if you will, embedded
24 in another part applicable regulation.

25 MR. THOMAS: It is. In Appendix E we have

1 Section 6 something is the emergency response data
2 system where we address that, but the requirement is
3 actually in 50.72 so I didn't see the need for
4 redundancy.

5 MEMBER SKILLMAN: Okay. Thank you.

6 MR. THOMAS: We should be on Slide 27
7 where we start talking about reentry, the general
8 plans and methods to allow entry into the Emergency
9 Planning Zone during and after an emergency.


10 Capabilities should exist that the
11 specific plans can be developed during an emergency to
12 allow for timely reentry into the affected parts of
13 the EPZ and the facility as conditions warrant.

14 No. 10. Drill and exercise program that
15 tests and implements major portions for the planning
16 and preparation of coordinated response by the onsite
17 response organizations with the offsite response
18 organizations within the Emergency Planning Zone
19 without a mandatory public participation.

20 No. 11. The methods for maintaining the
21 emergency plan, contacts and arrangements, procedures,
22 evacuation time estimate up to date including periodic
23 reviews by the licensee and the coordinating
24 organizations.

25 And the next slide, Slide 28. We get to

1 the hazard analysis which we looked at earlier. The
2 words "collocation, modularity, industrial" I don't
3 believe are in the actual rule text. I used that on
4 this slide just to pinpoint what I'm actually
5 addressing, or intend to address, with this proposed
6 paragraph.

7  MEMBER CORRADINI: I don't -- so you're
8 saying -- I'm not sure what you just said. You're
9 saying that what's in the parens doesn't appear in the
10 rule?

11 MR. THOMAS: I don't believe it does.

12 MEMBER CORRADINI: But your intent is to
13 consider it?

14 MR. THOMAS: Yes. This is the
15 consideration that we have for the hazard analysis for
16 the intensive -- elsewhere I told you I was going to
17 address collocation, modularity, and industrial in the
18 SRMs and the SECYs. This is where I'm addressing
19 collocation, modularity, and industrial facilities.

20 CHAIRMAN BLEY: Why had you folks decided
21 not to be specific on that?

22 MR. THOMAS: Is it in the rule language?
23 I didn't think it was. It is in the guidance.

24 CHAIRMAN BLEY: Okay.

25 MR. THOMAS: I was getting ready to read

1 the guidance --

2 CHAIRMAN BLEY: I remembered it from
3 somewhere.

4 MR. THOMAS: Yes, sir. It's in the
5 Statements of Considerations.

6 CHAIRMAN BLEY: Legally binding.

7 MR. THOMAS: Modular reactor, non-light
8 water reactor, or nonpower production or utilization
9 facility. Applicant or licensee that chooses to adopt
10 the EP regulations in Section 5160 must include in the
11 emergency plan an analysis of any credible hazard from
12 a contiguous facility that would adversely impact the
13 implementation of the emergency plans.

14 The emergency plans should describe the
15 results of the hazard analysis of any contiguous
16 facility, planning activities, or emergency response
17 functions that will address any credible hazard that
18 would adversely impact the implementation of the
19 emergency plans.

20 The analysis should identify and
21 characterize site-specific hazards posed by
22 multi-modular or nuclear units or contiguous
23 facilities that could complicate the small modular
24 reactor or non-light water reactor or nonpower
25 production and utilization facilities' emergency

1 response. For example, the nature of the challenge in
2 terms of timing, severity, and persistence.

3 Evaluate the impacts of the identified
4 hazards; for example, realistic response time,
5 functional threats caused by the hazard, strategies
6 needed to address the hazard. And describe the
7 planning activities or emergency response functions
8 that will mitigate the impacts of the identified
9 hazard.

10 MEMBER SKILLMAN: And this is where we
11 would sure like to see something like what we
12 periodically updated.

13 CHAIRMAN BLEY: Just for my illumination
14 the Statements of Consideration, are they in the FRN?

15 MR. THOMAS: Yes, sir.

16 CHAIRMAN BLEY: Are they labeled that way?
17 I didn't remember seeing that label.

18 MR. THOMAS: I don't think it's labeled
19 that way.

20 CHAIRMAN BLEY: That seems to be happening
21 these days which is a little confusing because my
22 understanding is Statements of Consideration are
23 legally used and the lawyers refer back to them all
24 the time. Except in some of the older rules it's
25 really hard to find the Statements of Consideration.

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1 If they are in the FRN, that's great. It would be
2 nice if we knew what they were.

3 MR. THOMAS: And Howard Benowitz, our
4 attorney, is at the mic.

5 MR. BENOWITZ: Howard Benowitz, Office of
6 General Counsel. The Statements of Consideration are
7 the part of the Federal Register Notice that appear
8 for the rule text.

9 CHAIRMAN BLEY: Always.

10 MR. BENOWITZ: I think the Office of the
11 Register refers to them as supplementary information.
12 I think that is the actual heading in the FRN. They
13 are not legally binding. The Statements of
14 Consideration, supplementary information, are more
15 like guidance so lawyers might be referring to them
16 not to legally binding requirements, but maybe for
17 explanations of those requirements. That's their
18 intent.

19 CHAIRMAN BLEY: What the requirements
20 mean.

21 MR. BENOWITZ: It's what does the agency
22 mean in the rule language. What is the basis for the
23 proposed rule.

24 CHAIRMAN BLEY: They used to actually be
25 labeled Statements of Consideration.

1 MR. BENOWITZ: Long time ago.

2 CHAIRMAN BLEY: Some of us have been
3 around. Go ahead.

4 MR. THOMAS: Okay. Slide No. 29. We
5 lumped two of these requirements on the same page.
6 One of the Emergency Planning Zone. Licensees and
7 applicants must determine and describe the boundary,
8 physical characteristics of the Emergency Planning
9 Zone in the emergency plan.

10 This is not the analysis. Remember the
11 analysis is required as part of the application and
12 those requirements contained in Sections 50.33 and 34.
13 This is just -- once you establish the EPZ what does
14 it look like. Currently we have maps and other
15 descriptions and stuff like that in the emergency
16 plan. It's the same idea here.

17 The next one is the ingestion response
18 planning. This is the requirement for the description
19 of all of the resources and capabilities that would go
20 into ingestion response planning. This is applicable
21 for those facilities with an onsite only EPZ within
22 the site boundary or at the site boundary, and for
23 those facilities that have an offsite EPZ.

24 Next slide, please. Implementation. Here
25 we are not deviating from what's already required for

1 operational programs. Eighteen months prior to fuel
2 loading for Part 52 combined license application, or
3 18 months before the issuance of an operating license
4 for a Part 50 operating license issuance. We're not
5 deviating too far outside that box for the
6 implementation of this operational program.

7 Next slide, please. We've been talking
8 all day about a particular question that we have set
9 up for this scope. Here are all of the specific
10 requests for comments and it's contained within
11 Section IV of the FRN and there are several other
12 sections.

13 There are specific questions on here. We
14 are asking a question about the scope of the proposed
15 rule, performance-based requirements, drills or
16 exercises, planning activities, hazard analysis for
17 contiguous facilities, the Emergency Planning Zones.

18 Next slide, please. They are up on the
19 screen. There's all sorts of more questions here.
20 Draft regulatory analysis question, cumulative effects
21 of regulation, plain writing, environmental
22 assessment, Paperwork Reduction Act, and on the Draft
23 Regulatory Guide. Within the FRN we actually have the
24 addresses and instructions on how the public can
25 provide us those comments as required.

1 Next slide, please. Slide No. 33. There
2 is a nexus between what we're doing here and the
3 Licensing Modernization Project. The Licensing
4 Modernization Project's objective is to develop
5 technology-inclusive risk informed and performance
6 based regulatory guidance for licensing with non-light
7 water reactors.

8 The NRC could consider and possibly
9 endorse an industry-submitted working draft of a
10 consolidated guidance document called Risk-Informed
11 Performance-Based Guidance for Non-light Water Reactor
12 Licensing Basis Development.

13 The NRC is supporting activities related
14 to the licensing modernization project being led by
15 Southern Company coordinated by the Nuclear Energy
16 Institute, and cost sharing by the Department of
17 Energy.

18 The current draft of this document was
19 submitted on May 27, 2018. The staff has held several
20 public meetings to discuss the draft guidance document
21 and brief the ACRS in June of 2018. As you can see
22 from the purpose of the licensing modernization
23 project the staff is currently working to ensure the
24 guidance related to the project is consistent with and
25 supportive of the proposed rule and draft guide.

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1 The staff is scheduled to brief the ACRS
2 Future Plant Design Subcommittee again in October 2018
3 and the ACRS full committee in December 2018. The
4 staff is targeting late calendar year 2019 to issue a
5 draft regulatory guide DG-1353 to endorse the
6 NEI-18-04 guidance which will be submitted to the NRC.

7 → MEMBER REMPE: When we had the meeting on
8 this, we discussed the point that the two-hour limit
9 for 10 CFR 20 was not included. They said, well, they
10 need them for a licensing basis event selection.

11 That's all true, but as I recall, former
12 Commissioner Apostolakis pointed out, "Yeah, you're
13 right. Even if you use this to select your licensing
14 basis events and you design your reactor that way, you
15 may not meet all the regulations."

16 Now, with emergency planning it seems like
17 it better include that two-hour limit for 10 CFR 20.
18 It's just something to think about if you do this
19 draft guide and you endorse it.

20 MEMBER CORRADINI: I don't understand.
21 Versus the --

22 MEMBER REMPE: Okay.

23 MEMBER CORRADINI: For them to make an
24 action based on the PAGs is a dose over time and the
25 time goes longer. That's why I'm not clear. You guys

1 are writing it down so I'm still not sure if there's
2 a consistency.

3 MEMBER REMPE: I'm not sure at all but I
4 just am bringing up the point that if you endorse it,
5 it may not meet all the regulations. Yeah, you can
6 use it for licensing basis events. For the PAG,
7 again, it's not clear to me and it would be cleaner if
8 they would include all of the regulations in that
9 document in the draft guide.

10 MR. SEGALA: This is John Segala, NRC
11 staff in NRO. I think it's part of the licensing
12 modernization project. We are making it clear that,
13 you know, if we endorse that process, they still have
14 to meet all the NRC's regulations.

15 MEMBER REMPE: If you design a plant for
16 that, it may not need all the regulations. Thanks.

17 MR. THOMAS: Okay. That concludes my
18 portion of the presentation. I'm going to now turn it
19 over to Dr. Carrera who will discuss the status and
20 the path forward.

21  DR. CARRERA: Okay. Thank you, Kenny.

22 Good morning, Mr. Chairman, and ACRS
23 members, and members of the audience. My name is
24 Andrew Carrera. I'm one of the project managers for
25 this rule. Dennis Andrukat is my co-pilot and he's

1 standing back there. You can look up his number if
2 you have any questions.

3 (Laughter.)

4 Thank you again for allowing us the
5 opportunity to come in front of you to discuss this
6 rulemaking on Emergency Preparedness for Small Modular
7 Reactors and Other New Technologies.

8 I initially made this protest to Trish
9 before and I'm making this protest to you, Mr.
10 Chairman. After two years of hard work, scraping my
11 knees and my hands, catering to every need of the
12 working group, all I get is just one lousy slide that
13 talks about schedules and process which no one wants
14 to hear. I've got to follow through and be a soldier
15 about it.

16 (Laughter.)

17 I would like to take a moment today to
18 briefly go over the current status of the rulemaking
19 effort on where we are now and where we're going next.

20 You've heard from Trish and Kenny on how
21 we got here with the background information on SMR
22 SECY-16-0069 where the Commission approved the staff's
23 rulemaking plan to move forward. Since then the staff
24 has had significant interactions with internal and
25 external stakeholders regarding this rulemaking

1 effort.

2 The staff will continue interactions with
3 the Federal Radiological Preparedness Coordinating
4 Committee to discuss issues of mutual interest to the
5 NRC and our federal partners.

6 The staff also coordinated with other NRC,
7 as you heard before, such as the ongoing regulatory
8 improvement for production and utilization facilities
9 transitioning to decommission, or the DECOM rule, and
10 the non-power production of utilization facilities
11 license renewal, or the NPUF rule.

12 As well as the Tennessee Valley Authority
13 early site permit review that we touched a little bit
14 on earlier to ensure that what we do in this
15 rulemaking will not undue the great work that has
16 already been done to other projects. As such, we
17 continue to assess and coordinate this rulemaking
18 effort with those activities moving forward.

19 Current status of this rulemaking is that
20 the staff is still working on finalizing this draft
21 proposed rule. The staff has released a draft
22 rulemaking document to support today's rulemaking, but
23 please note that these documents have not been subject
24 to the Commission's senior management and legal review
25 and approval and the contents should not be taken as

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1 final official agency position.

2 Following this meeting the staff plans to
3 continue working on these documents as well as other
4 documents related to this rulemaking effort.

5 The staff now has to provide a final
6 proposed rule package including the associated draft
7 guidance document to EDO on September 28th and to
8 Commission for approval on October 12th. As Trish
9 mentioned earlier, we are currently on track to meet
10 these dates.

11 Pending Commission approval the proposed
12 rule package and associated draft guidance documents
13 will be issued for official public comments in
14 estimated early in 2019.

15 After the official public comment period
16 closes and based on the public comments received, the
17 staff will develop a draft final rule which the staff
18 plans to submit to the Commission for approval in
19 early 2020.

20 I believe our next scheduled discussion
21 with the ACRS regarding this proposed rule after
22 today's meeting will be at the full committee meeting
23 in October. I've heard some requests -- some desires
24 from ACRS members that we should still go back to the
25 ACRS for further clarification or discussion of those

1 aspects of this rule after this rule has been
2 published. That is a discussion that needs to be done
3 at Trish's level and the committee level on how we can
4 best accommodate your request.

5 CHAIRMAN BLEY: Okay. That's good. Work
6 with Derek on that as time goes on. I don't know when
7 that will happen here. They are not due for their
8 final rule until 2020. That's not that far away, is
9 it?

10 DR. HOLAHAN: No.

11 DR. CARRERA: In rulemaking timeline
12 anything beyond three weeks is purely a guess.

13 CHAIRMAN BLEY: I would suggest, and you
14 can talk with Derek some about this, for October if
15 anything you folks do internally leads to anything
16 anticipated changes, go through those in great detail
17 in October.

18 Over two-thirds of us are here today so it
19 will be a review for the rest of us. There are
20 several members who are not here today who will be
21 hearing this for the first time in October and we're
22 expected to write a letter about what we've heard at
23 that time.

24  Anything else from members for the staff?

25 Okay. I think we're finished. We have some public

1 comments from members of industry, and then we'll have
2 comments from anyone on the line or here in the room
3 who wants to make them.

4 My understanding is that we have five
5 people who wish to speak. The first one on my list is
6 Farshid Shahrokhi from Framatome. I hope I didn't
7 mangle your name too much but please come forward.

8 → MR. SHAHROKHI: Thank you, Dr. Bley. My
9 name is Farshid Shahrokhi. I'm the high-temperature
10 gas reactor director of technology for Framatome.
11 Obviously we support and encourage this rulemaking,
12 this proposed rulemaking, and the basis for our
13 support is our reactor design.

14 Our reactor is a high-temperature gas fuel
15 reactor prismatic. It's a four-modular plant. Many
16 safety systems, impassive and inherent safety, and at
17 the core of that is our fuel. It's been under
18 irradiation qualification the last 15 years. We have
19 another three or four years to go.

20 Interim results from this radiation
21 exceeds our expectations. Our reactor is basically
22 designed to produce process heat in the form of
23 high-temperature steam and, of course, we can product
24 electricity also. Therefore, we need to be collocated
25 near our end users.

1 Performance of our reactor establishes EPZ
2 at our plant boundary which is 400 meters which is our
3 site boundary. The dose rate for our boundary based
4 on expected performance of our fuel and our reactor
5 design is much less than one rem over any two-hour
6 period.

7 Based on that, of course, that doesn't
8 mean that the potential owner operator of our reactor
9 will not have an emergency plan. It will be similar
10 to the emergency plan of any industrial facility. It
11 will not be a basis of this license. It will be a
12 cooperation with the local and state authorities to
13 establish an emergency plan on that site. Thank you.

14 CHAIRMAN BLEY: Thank you. I should
15 mention most of the people who are going to speak now
16 have submitted written comments and those will be
17 attached to our minutes when they are published on the
18 NRC website.

19 Next is Steve Mirsky from NuScale. Steve.

20 → MR. MIRSKY: Thank you, Dr. Bley. My name
21 is Steven Mirsky. I am currently the senior technical
22 adviser for NuScale Power. Previously I was manager
23 of Regulatory Affairs. Of all the vendors you may be
24 hearing from tonight -- excuse me, today, we are the
25 one vendor of an SMR that is actually under review by

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1 the NRC. We submitted our design certification in
2 January of 2017.

3 I heard a number of comments made by some
4 members regarding concerns about how this proposed
5 rulemaking could actually be applied. I think it's
6 important to present the ACRS with as much information
7 of what has really been going on the last few years to
8 help you in seeing a perspective.

9 NuScale started engaging with the NRC and
10 preapplication on Emergency Planning Zone back in
11 2011, six years before our submittal. NuScale has
12 worked closely with NEI to develop NEI white papers
13 that were submitted to the small modular reactor
14 Emergency Planning Zone methodology.

15 NuScale's presentations to the NRC have
16 occurred over several years. In 2015 NuScale
17 submitted a plume exposure Emergency Planning Zone
18 methodology topical report. We support this proposed
19 rulemaking because it exactly aligns with our
20 methodology topical report.

21 A methodology topical report is
22 performance based, risk informed, and consequence
23 oriented. It's been under review by the NRC since
24 2015. It's been revised once and we are now in the
25 mode of waiting for the development of the safety

1 evaluation report which you will all, of course, be
2 seeing in future ACRS meetings.

3 I would like to assure ACRS members that
4 the methodology doesn't appear to be extremely
5 detailed and is sufficient for a vendor to develop a
6 topical report and a means to justify a pre-exposure
7 Emergency Planning Zone at distances different from 10
8 miles.

9 I also would like to make one comment
10 about PRA and NUREG-0396. We looked very closely at
11 NUREG-0396. We've been able to duplicate the figures
12 specifically in Appendix I, the famous knee curve
13 which was the basis for the 10-mile plume exposure.

14 I think it's important to note that the
15 state of technology of PRA in 1974 and the state of
16 knowledge of the input to PRA. That is actually very
17 crude compared to what we have today. The PRA that
18 NuScale has done and revised many times involves much
19 fewer systems, much fewer structures, much fewer
20 components and considerably more --

21 AUTOMATED HONE MESSAGE: Pardon the
22 interruption. Your conference contains less than
23 three participants at this time. If you would like to
24 continue, press *1 now or the conference will be
25 terminated.

1 MR. MIRSKY: That's all I've got to say.

2 CHAIRMAN BLEY: It worked.

3 (Laughter.) Thanks, Steve.

4 Next we'll have Brian Johnson from
5 TerraPower.

6 → MR. JOHNSON: Hello. I'm Brian Johnson
7 from TerraPower. I'm the nuclear risk assessment lead
8 which is sort of short for Chapter 19. There's a lot
9 of stuff in there. I just wanted to come and say we
10 do support and encourage this rulemaking. A lot of
11 thanks certainly to NuScale and NEI developing the
12 methodology. We've written an emergency preparedness
13 plan that we would like to implement.

14 In looking at this draft rulemaking it's
15 extremely aligned with the NEI guidance with what
16 NuScale has been doing and the path that TerraPower
17 would like to go forward with our reactor designs.

18 For those who are not familiar, we are
19 pursuing both TWR more in China, but that could
20 eventually become a global product, as well as the
21 MCFR. TerraPower is an innovation company so we limit
22 ourself to two reactors. We are very excited to see
23 this rulemaking.

24 We do think that the PRA elements that a
25 lot of people are concerned about being crude, I was

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1 sort of going to say something reverse to what NuScale
2 said. With the 0396 there are using the most relevant
3 cold data, the most relevant data they could get to
4 make their PRAs for the nuclear reactors.

5 As we develop new technologies, we
6 shouldn't let the lack of operating data for those
7 specific technologies prevent us from creating PRAs
8 that we can use to inform our design, we can use to
9 inform our failures, and the expected reliability of
10 a lot of equipment in these reactor types. I think
11 this is very exciting. I think it's doable. I think
12 it will provide a lot of flexibility and also
13 practicability for licensing new designs.

14 CHAIRMAN BLEY: Thank you.

15 Next should be Darrell Gardner of Kairos.

16  MR. GARDNER: Thank you. I'm Darrell
17 Gardner with Kairos Power. We submitted comments in
18 writing. This is just a brief summary of some of the
19 highlights here.

20 I'm director of Licensing Applications and
21 we wanted to point out that we're developing a
22 TRISO-based fuel molten salt cool reactor design.
23 It's a new technology. We think this will enable us
24 to support our mission to transition the world to
25 clean energy sources and make a difference in

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1 improving people's quality of life around the world.


2 We expect to demonstrate minimal exposure
3 to the public as a result of postulated accidents and
4 as a result of the reduced source term, longer acts of
5 progression times, increased use of passive safety in
6 the design.

7 The deployment of this and other
8 technologies requires removal of artificial barriers
9 to emergency planning requirements not commensurate
10 with the risk of these technologies.

11 We encourage the NRC's proposed rule and
12 support the efforts here today.

13 CHAIRMAN BLEY: Thank you.

14 Last should be Brandon Waites from
15 Southern Nuclear.

16  MR. WAITES: Thank you for the opportunity
17 to speak today. My name is Brandon Waites. I am with
18 Southern Nuclear Development. I am providing
19 consulting services to X Energy for their design in
20 the area of regulatory affairs.

21 Today I would like to provide a few
22 comments for X Energy about this proposed rule. X
23 Energy supports to propose performance based EP rule.
24 X Energy is pursuing the deployment of Xe-100 reactor,
25 a pebble bed high temperature gas cooled reactor

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1 design that emphasizes highly reliable passive and
2 inherent safety features.

3 Leveraging this inherent safety case is
4 instrumental to X Energy's business case. The
5 proposed draft guidance and rulemaking, if adopted,
6 will provide vendors and users the ability to leverage
7 lower risk profiles and remove obstacles currently
8 associated with the deployment of advanced reactor
9 technologies under existing rules.

10 X Energy commends the work done in this
11 area for advanced reactor technologies and looks
12 forward to similar work done in other areas to further
13 enable advanced reactor deployment. Thank you.

14 CHAIRMAN BLEY: Thank you.

15 → At this point I would like to get the
16 phone line open. While we're waiting for that, if
17 there's anyone in the room who would like to make a
18 comment, please come to the microphone and identify
19 yourself and make a comment.

20 Is there anyone on the phone line who
21 would like to make a comment? If so, please identify
22 yourself and make your comment.

23 → MS. FIELDS: Yes. This is Sarah Fields --

24 CHAIRMAN BLEY: I'm sorry. If you're
25 using a speaker phone, can you go to the handset?

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1 You're cutting out a lot. Can you go ahead? Do you
2 want to try again?

3 Is there anyone else who would like to
4 make a comment? I'll give her just a minute and see
5 if she's trying to dial back in.

6 MS. FIELDS: This is Ms. Fields. My
7 connection dropped off. I hope I can continue my
8 comments.

9 CHAIRMAN BLEY: Yeah, go ahead. This is
10 much better. We can hear you now.

11 MS. FIELDS: Okay. Is the NRC taking into
12 consideration the indefinite storage for fuel at a
13 small modular reactor and maybe at some other advanced
14 reactor site? For example, NuScale intends to use
15 conventional nuclear fuel. Not that it's wrong but it
16 will still be conventional fuel.

17 Eventually it will go into the spent fuel
18 pool for five years and then be removed into canisters
19 and the design of those canisters has not been
20 identified. Currently there is no place to move that
21 fuel, only in terms of indefinite storage of that
22 fuel.

23 I don't see where you are taking into
24 consideration the possibility of different types of
25 accidents or releases related to that fuel. I would

1 like maybe some comment from the ACRS about this.

2 CHAIRMAN BLEY: Thank you for your
3 comment. We don't engage in discussions. We are
4 collecting information but your comments will appear
5 in our transcript and we will consider them. Thank
6 you.

7 MS. FIELDS: I read your comments in your
8 final determination. Thank you.

9 CHAIRMAN BLEY: Thank you.

10 Anyone else care to make a comment? Okay.
11 We'll close the phone line now. Thank you.

12 → At this time I'm going to go around to the
13 members and see what comments they have.

14 Pete Riccardella, are you still on the
15 line and can you make comments?

16 → MEMBER RICCARDELLA: I am. I guess I have
17 some thoughts, you know, regarding modular reactors we
18 earlier had the discussion of single unit versus
19 multiple modules on a single site.

20 It seems to me that if the methodology is
21 truly risk informed and performance based that it
22 should be possible to address different accident
23 frequencies for single versus multiple module
24 accidents, as well as the different source terms that
25 are involved. I don't see that to be a big issue in

1 this regard.

2 Then I'm also keenly intent on Dick's
3 point about future changes that might influence the
4 emergency plan and initial citing versus continual
5 assessment. That's all I have.

6 CHAIRMAN BLEY: Thanks, Steve. Thanks for
7 being there.

8 Walt.

9 MEMBER KIRCHNER: I would just thank the
10 presenters. I don't have any further comments at this
11 point. Thank you.

12 CHAIRMAN BLEY: Charlie.


13 MEMBER BROWN: I have no further comments.
14 Thank you.

15 CHAIRMAN BLEY: Thank you, Charlie.

16 Jose.

17 MEMBER MARCH-LEUBA: I have no specific
18 comments.

19 CHAIRMAN BLEY: Joy.

20  MEMBER REMPE: So I also side with or like
21 the second what Pete said about that I think the draft
22 rule should explicitly say multiple modules need to be
23 considered with a parenthetical statement. I agree
24 that the continuous updates to emergency planning
25 should be noted.

1 I guess I would like to see some
2 additional guidance on the source term more than what
3 I saw in Appendix A. For example, I think that some
4 discussion of cutoff frequency might be useful here,
5 or some place.

6 I am also curious about the 96 hours. Why
7 the first 96 hours and should we be thinking about
8 just reactor which might have something that comes out
9 at 100 hours. I mean, why just that first 96 hours?

10 Last, there are those two papers and they
11 are not yet released. I would like to make sure those
12 two references are released publicly before we meet
13 again. Okay? Thank you.

14 CHAIRMAN BLEY: Thanks.

15 Mike.

16 MEMBER CORRADINI: No, I don't have any
17 additional comments. I think we've talked about our
18 concerns and interests earlier. Thanks to the staff.

19 CHAIRMAN BLEY: Thank you.

20 Matt.

21 → MEMBER SUNSERI: I would like to thank the
22 presenters and a few general comments. I do generally
23 support the need for and the direction of this rule.
24 I think it's important and necessary.

25 I suppose my biggest concern, which is

1 probably too strong a word, but the observation I'll
2 make is regarding the discriminator for applicability.
3 The success or failure of a rule like this will depend
4 on the implementation guidance and the quality of that
5 guidance.

6 I think you heard a number of comments
7 today about what is the discriminator, megawatts or
8 whatever, source term this or that. We heard, I
9 think, at least in my mind conflicting information
10 regarding the source term, whether the citing criteria
11 is bounding or not, multiple modules. Some of my
12 colleagues have already commented on this.

13 I suppose my closing point here is I look
14 forward through the comment period and after you get
15 the public and industry and everybody's comments after
16 the Federal Register addressing these issues in a way
17 that would make sense and make it absolutely clear how
18 we are going to implement this rule and who is going
19 to do that.

20 Just one final comment. I wasn't in the
21 military but maybe Charlie can comment on this. I've
22 often heard military planners say the battle plan goes
23 out the window when the first shot is fired. I think
24 a similar analogy applies here.

25 I don't know that we need to necessarily


1 have emergency plans that address the worse
2 conceivable thing that we could ever think of, but
3 what is the most credible thing that can happen at
4 these plants from a radiological consequences
5 perspective.

6 If we can adequately prepare for that,
7 then that planning and that thinking process will
8 carry over to whatever absurd thing that we might be
9 able to think of.

10 I've seen this happen in the communities
11 where I've worked where non-radiological events have
12 occurred; tornadoes, storms, floods, whatever, but the
13 community responded to those in a way of implementing
14 what they learned through working with the nuclear
15 power plant that was really beneficial to the
16 community. I think that type of thought adds value.
17 That's all I have. Thank you, Dennis.

18 CHAIRMAN BLEY: Thank you.

19 Dick.

20  MEMBER SKILLMAN: First of all, to Dr.
21 Holahan and the whole staff, thank you very much for
22 a very beneficial morning.

23 Second comment I would like to make is we
24 learned at TMI-2 the importance of the containment.
25 The containment of TMI-2 saved the day. It held the

1 water from going in the Susquehanna River and it
2 prevented any real offsite dose release.

3 To that point, the way this documentation
4 is written, as Dr. Bley said, it seems to be all
5 around EP. It really needs to focus on source term.
6 Let me give you an example. We just had several SMR
7 vendors in here talking about their product. Salute
8 to them.

9 Let's suppose the staff and the ACRS gets
10 real antsy and basically says, "We don't like that
11 design because we have questions about the source
12 term." That vendor then says, "Okay. We'll put a
13 second containment on it. We say, "We still don't
14 like that." They says, "We've got deep pockets.
15 We'll put another containment."

16 At some point the designer has the
17 capability to make that source term of no consequence.
18 This rule should allow that. It should allow a
19 designer to be so innovative that the offsite releases
20 are so low that one would say that is a safe facility.

21 In my view, the source term carries the
22 day in this discussion as the reactor building carried
23 the day on March 28th of 1979. I don't think the
24 importance of that can be understated. A good strong
25 box, a good strong steel container, is just what the

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1 doctor ordered.

2 Let the legislation, let the documentation
3 that you're creating, let the rule that you're
4 proposing focus solidly on source term that all of
5 kind of say, yeah, if we follow that path, we will
6 have a successful facility in terms of radiologic
7 consequence no matter what the fuel is. Thank you.

8 CHAIRMAN BLEY: Thanks, Dick.

9 Ron.

10 MEMBER CORRADINI: Green light.

11 MEMBER BALLINGER: I'm not the first and
12 not the last.

13 CHAIRMAN BLEY: But you're consistent.

14 (Laughter.)

15 MEMBER BALLINGER: Well, since Stetkar
16 left. Where was I? I appreciate the presentations a
17 lot but I have no further comments.

18  CHAIRMAN BLEY: Thanks, Ron.

19 I, too, would like to thank all the
20 presenters today and thank you for your patience and
21 lengthy discussions. I'm sure we'll have more in the
22 future. I won't reiterate the things I've already
23 said but I stand by them. We'll look forward to
24 seeing you in October. We'll have some discussions
25 through Derek on our part for what to expect at that

1 time.

2 → Like I say, if anything out of this
3 meeting or anything that evolves as you go forward
4 makes changes of any kind in the rule language or in
5 the guidance, please bring that and show us clearly.
6 I assume it won't be much. If it heads that way, then
7 we need to see something in writing. But I think if
8 it's all minor things, you can show us at that time.

9 I would like to finally thank everyone
10 else who was here for a good session. We are
11 adjourned.

12 (Whereupon, the above-entitled matter went
13 off the record at 11:44 a.m.)

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ACRS
Future Plant Designs and
Regulatory Policies and Practices Subcommittees
August 22, 2018

My name is Farshid Shahrokhi - I am the director of the high temperature gas-cooled reactor (HTGR) technology at Framatome Inc.

Framatome's steam cycle HTGR relies on the performance and radionuclides retention characteristics of TRISO particle fuel currently undergoing irradiation testing for qualification at Idaho National Laboratory.

Interim results from multi-year irradiation and testing campaign indicate better than expected results. Framatome's steam cycle HTGR is designed to deliver process heat and electricity at the highest level of reactor safety utilizing intrinsic and passive safety design features.

The combined radionuclides retention capabilities of TRISO particle fuel, intrinsic, and passive safety of our design concept limits the accident dose to less than 1.0 Rem (EPA PAG dose limit) in any two hour time interval during and following any design bases accident at the plant site boundary of 400 meter.

In other words the SC-HTGR is designed to not interfere with the environment beyond the plant's site boundary.

We expect the plant owner/operator to develop a robust off-site emergency plan, not as a condition of the NRC license but in co-operation with the state and local authorities similar to the emergency plans of any other large industrial complex in the U.S.A.

Existing regulations on emergency planning (EP) do not allow the owner/operator to benefit from the added safety and security of the advanced reactors limiting incentives for deployments of these safer designs.

We therefore applaud and strongly support the NRC's proposed EP rulemaking.

August 21, 2018

Mr. Derek Widmayer
Advisory Committee on Reactor Safeguards
US Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Kairos Power LLC Comments on Draft Proposed Rule, *Emergency Preparedness for Small Modular Reactors (SMRs) and Other New Technologies (ONTs)*

Kairos Power appreciates the opportunity to provide comments for consideration by the Advisory Committee on Reactor Safeguards (ACRS) in their review of the subject proposed rule. Kairos is developing an advanced reactor in support of our team's mission, which is to enable the world's transition to clean energy, with the ultimate goal of dramatically improving people's quality of life while protecting the environment. We seek to address energy poverty, reduce the impact of climate change, create real and lasting jobs, and reestablish American technology leadership. But doing that requires that we remove artificial impediments to deploying this safe technology.

Kairos is developing a solid, TRISO-fueled, molten salt-cooled, high-temperature reactor. We expect to demonstrate minimal public exposure during conservatively postulated events.

Kairos strongly supports the proposed rule. We know from the direct involvement of members of our team that this rule represents years of collaboration on an approach that recognizes enhancements in safety of advanced designs while still requiring applicants to demonstrate compliance with rigorous requirements before the new approach can be used. The proposed rule acknowledges safety enhancements such as reduced core inventories and source terms, reduced potential for accidents, longer progressions of events postulated to lead to releases, and increase in the use of passive safety. Further, as indicated in the proposed rule package, the rule would apply the same dose standard for predetermined protective actions as is required of the current operating large reactors. It results in no less protection of public health and safety as compared to existing requirements for the current operating fleet.

The real risk associated with many other industries is much higher than a reactor, yet our industry historically presupposes that a higher burden is necessary. The proposed rule is logical in that it removes barriers to deployment by establishing requirements commensurate with the risk of the technology.

Importantly, the lack of a pre-approved offsite emergency plan – which is an important aspect of the change being contemplated in this rule – does not imply a lack of emergency planning, but rather a level of emergency preparedness more aligned with other comparable risks.

Kairos is pleased to support this rulemaking and we hope the ACRS finds these comments to be useful.

Respectfully submitted,



Peter Hastings, PE
Vice President, Regulatory Affairs & Quality

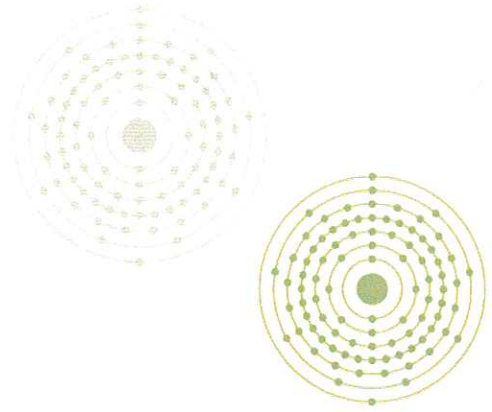
NuScale Power, LLC Comments on the August 22, 2018 ACRS SC EP Rulemaking Meeting

NuScale Power fully supports the NRC proposed rulemaking on small modular reactor (SMR) and other nuclear technology (ONT) Emergency Planning (EP). This proposed rule, along with draft regulatory guide DG-1350, was developed in response to a series of Commission-approved documents (i.e., SECYs and SECY-SRMs) that were issued since 2005, as well as to extensive nuclear industry input. It is based on evaluation of the technical basis for current emergency planning regulations for large light water reactors (LLWRs) and application of this identical basis to SMRs and ONT. New rulemaking for SMR and ONT EP is in alignment with revisions of many other LLWR regulations, which have been updated to reflect the enhanced safety, simplicity and smaller radionuclide source terms of SMR and ONT designs.

The NuScale SMR was designed to: eliminate many safety issues; greatly reduce the likelihood and consequence of applicable accidents; simplify operations; and expand reliance on passive systems and natural processes resulting in unparalleled resiliency. All these features greatly reduce risks to public health and safety. This proposed EP rulemaking is in alignment with the NuScale plume exposure EPZ methodology topical report that is currently under review by the NRC. Both the proposed EP rulemaking and the NuScale EPZ topical report describe a performance-based, risk informed, consequence-oriented approach.

Public perception of nuclear power plant risk is closely tied to EP because signs, sirens, and emergency drills associated with the current 10-mile plume exposure emergency planning zone (EPZ) are a tangible and visible manifestation of potential danger to individuals. The NRC has determined that many licensed nuclear facilities including: low electric power commercial nuclear plants; research and test reactors; decommissioned nuclear power plants; orphan (i.e., with no collocated nuclear power plant) independent spent fuel storage installations (ISFSIs); and medical or industrial radioisotope users have an inherently low public health risk. This low risk results in a reduced EPZ by setting it at a smaller distance, the site boundary, or replacing the EP with existing facility all hazard plans. This proposed rulemaking uses the identical regulatory basis and technical justification to allow SMRs and ONTs the same opportunity to have an appropriately sized EPZ. An appropriately sized EP for an SMR or ONT will afford the same protection to the public as the current 10-mile plume exposure EPZ at operating LLWRs.

Since its inception in 1980, the underlying goal of EP has always been to protect the public. The proposed rulemaking provides the identical level of protection while recognizing that 21st century nuclear power plant technology has and will offer game changing advances in safety. Crediting the new paradigm in SMR and ONT safety by an appropriately sized EPZ accurately informs the public on the relative risk of new nuclear power plants. Imposing unnecessary public EP responses (e.g. evacuation) to low risk nuclear facility events has been shown to increase risks to public health and safety, which is antithetical to the basic tenet of EP.



August 17, 2018

Mr. Derek Widmayer, NRC/ACRS
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Comments on Draft Proposed Rule for EP for SMRs and ONTs

Dear Mr. Widmayer,

TerraPower LLC is pleased to provide comments to the Advisory Committee on Reactor Safeguards (ACRS) in support of the Draft Proposed Rule, *"Emergency Preparedness for Small Modular Reactors and Other New Technologies."* TerraPower is developing multiple advanced reactor technologies. We support the Draft Proposed Rule and encourage NRC Commissioners to approve publication in the Federal Register of the proposed rule and draft guidance related to amending regulations for emergency preparedness for small modular reactors and other new technologies.

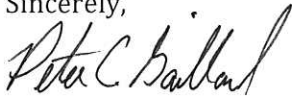
Existing regulations impose unnecessary regulatory burden and cost on applicants and licensees. This hinders development and deployment of advanced reactor technologies. Implementation of new emergency preparedness requirements as described in the proposed rule and draft guidance will increase the cost competitiveness of advanced reactor technologies by promoting the establishment of a clear, predictable and stable licensing process for advanced reactor technologies.

The new regulations will also enable advanced reactor technology developers to take advantage of technological advancements which may be used with the amended regulations and implementing guidance to further increase the cost competitiveness of advanced reactors. The level of public protection will be equivalent to that provided by existing emergency planning requirements by using the same public protection standard and EPA Protective Action Guidelines used by the current operating fleet of large light water reactors.

In addition, the international regulatory community continues to refer to NRC regulations for guidance and input when developing international regulations. If approved, the proposed changes may be reviewed and evaluated by international regulators. As a result, this rulemaking has the potential to benefit and influence international projects in addition to domestic projects.

For the reasons stated above, TerraPower supports the Draft Proposed Rule and encourages publication in the Federal Register by the NRC. Thank you for consideration of these comments. If you have any questions, please feel free to contact me at 425-324-2732 or via email at pgaillard@terrapower.com.

Sincerely,

A handwritten signature in black ink, appearing to read "Peter C. Gaillard".

Peter C. Gaillard
Manager, Licensing

ACRS Subcommittee
August 22, 2018



Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking

10 CFR Parts 50 and 52

NRC-2015-0225

RIN 3150-AJ68

- Project Manager: Andy Carrera (NMSS)
- Technical Leads: Kenneth Thomas (NSIR)
Steve Lynch (NRR)
Arlon Costa (NRO)

Emergency Preparedness for Small Modular Reactors and Other New Technologies

Proposed Rulemaking



- Purpose of Rulemaking
 - Amend regulations for new alternative performance-based EP requirements for future SMRs and ONTs.
- Proposed rule would be:
 - Technology inclusive for future:
 - SMRs
 - Nuclear power reactor < 1000MWt that may have modular design
 - ONTs
 - Non-light-water power reactors
 - Non-power Production or Utilization Facilities
 - » Medical Radioisotope Facilities

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- Major provisions of this proposed rule:
 - technology-inclusive for future SMRs and ONTs, including medical isotope facilities
 - alternative performance-based EP framework, including demonstration of effective response in drills and exercises
 - hazard analysis for contiguous facilities
 - scalable approach for plume exposure pathway EPZ
 - ingestion response planning option for SMRs and ONTs that opt to use §50.160.

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- Background

- SECY-10-0034, “Potential Policy, Licensing, and Key Technical Issues for Small Modular Reactor Designs”
- SECY-11-0152, “Development of an Emergency Planning and Preparedness Framework for Small Modular Reactors”
- Final Rule in 2011 Enhancements to EP, post-Fukushima EP enhancements
- SECY-14-038, “Performance-Based Framework for Nuclear Power Plant Emergency Preparedness Oversight”

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- Background

- SRM-SECY-14-0038, “Performance-Based Framework for Nuclear Power Plant Emergency Preparedness Oversight”
- SECY-15-0077 and SRM-SECY-15-0077, “Options for Emergency Preparedness for Small Modular Reactors and Other New Technologies”
- SECY-16-0069 and SRM-SECY-16-0069, “Rulemaking Plan on Emergency Preparedness for Small Modular Reactors and Other New Technologies”

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- What about Operating Reactors?
 - They meet existing rules.
 - Developing and implementing would divert resources from other higher priority projects for the NRC and licensees.
 - Staff received a comment from NEI on draft regulatory basis document.
 - FRN would include a question whether to include within the rule's scope.

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- Scalable approach for plume exposure pathway EPZ
 - Same level of protection afforded to other reactors under existing rules
 - Consistent with the existing graded-approach afforded to other facilities

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- EPZ size technical analysis
 - The plume exposure pathway EPZ should encompass an area where prompt protective measures, such as evacuation and sheltering, may be needed to minimize the exposure to individuals.
 - The analysis should consider radiological releases from credible accidents for the facility.

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- Existing EPZ guidance for nuclear power plants
 - NUREG-0396, “Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants”
 - Sets generically applied distances
 - Dose Savings
 - Incorporated into the 1980 final rule
 - Describes the considerations for determining EPZ sizes

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- Planning basis for EP for SMRs and ONTs consistent with the analyses documented in NUREG-0396
- Development of guidance supported by User Need Request NSIR-2017-002
 - Generalized Dose Assessment Methodology for Informing Emergency Planning Zone Size Determinations
 - Required Analyses for Informing Emergency Planning Zone Size Determinations

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- Ingestion response planning
 - Early phase of the response
 - Precautionary protective actions
 - Washing garden products and food
 - Placing livestock on stored feeds
 - Longer term actions
 - Leading indicator drives response
 - Biological contamination similarities

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- National Preparedness Goal
 - National Planning Frameworks
 - Prevention
 - Protection
 - Mitigation
 - Response
 - Recovery
 - Federal Interagency Operations Plans

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



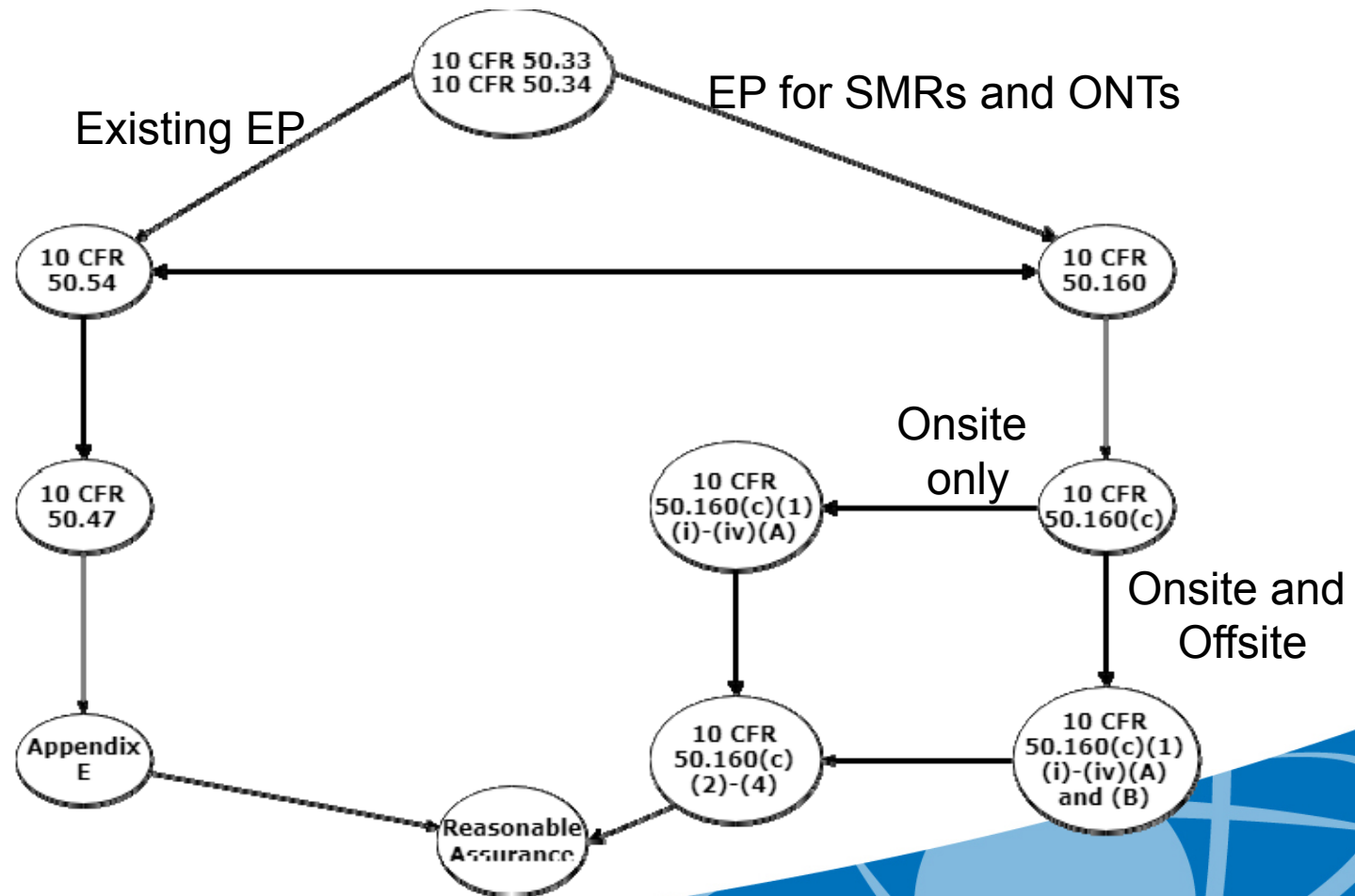
- Existing EP requirements for nuclear power plants in 10 CFR Part 50:
 - §50.47, “Emergency Plans”
 - Appendix E to Part 50, “Emergency Planning and Preparedness for Production and Utilization Facilities”
 - §§50.33, 50.34, and 50.54

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- Regulatory Basis: “Rulemaking for Emergency Preparedness for Small Modular Reactors and Other New Technologies”
 - Draft issued April 2017
 - Final issued November 2017
- Key comments

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- Draft Proposed Rule Changes:
 - §50.2 Definitions
 - Non-light Water Reactor
 - Non-power Production or Utilization Facility
 - Small Modular Reactors
 - §50.33 Contents of Applications; general information
 - §50.34 Contents of Applications; technical information

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- Draft Proposed Rule Changes:
 - §50.47 Emergency Plans
 - Conforming changes to paragraph (b)
 - Reserves paragraph (c)(2)
 - New paragraph (f)
 - §50.54 Conditions of licenses
 - Conforming changes to (q), (s), and (gg)
 - Clarifying when FEMA determinations would be needed.

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- §50.160
 - (a) Applicability
 - (b) Definitions
 - Site-boundary refers to the Part 20 definition

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- §50.160
 - (c) Requirements
 - (1) Performance-based framework
 - (i) Maintenance of performance: The licensee must maintain in effect preparedness to respond to emergency and accident conditions and describe in an emergency plan the provisions to be employed to maintain preparedness

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- §50.160
 - (c) Requirements
 - (ii) Performance indicators: The licensee must maintain and update at the end of each calendar quarter, a complete list of performance indicators for the previous eight calendar quarters;

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- §50.160
 - (c) Requirements
 - (1)(iii) Emergency response performance
 - (A) *Event classification and mitigation*
 - (B) *Protective actions*
 - (C) *Communications*
 - (D) *Command and control*
 - (E) *Staffing and operations*
 - (F) *Radiological assessment*
 - (G) *Reentry*
 - (H) *Critique and corrective actions*

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- §50.160
 - (c)(1)(iv) Planning activities
 - (A) Onsite-
 - (1) Public information
 - (2) Implement emergency response plan with safeguards contingency plan

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- §50.160
 - (c)(1)(iv) Planning activities
 - (A) Onsite-
 - (3) Voice communications with the NRC (Emergency Notification System)
 - (4) Emergency facility

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- §50.160
 - (c)(1)(iv) Planning activities
 - (B) Offsite (if the plume exposure pathway EPZ extends beyond the site boundary)
 - (1) Contacts and arrangements
 - (2) Notification of offsite organizations

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- §50.160
 - (c)(1)(iv) Planning activities
 - (B) Offsite (if the plume exposure pathway EPZ extends beyond the site boundary)
 - (3) Protective measures
 - (4) Offsite organizational training
 - (5) Evacuation time estimate

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- §50.160
 - (c)(1)(iv) Planning activities
 - (B) Offsite (if the plume exposure pathway EPZ extends beyond the site boundary)
 - (6) Emergency response facilities
 - (7) Offsite dose projections
 - (8) Public information

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- §50.160
 - (c)(1)(iv) Planning activities
 - (B) Offsite (if the plume exposure pathway EPZ extends beyond the site boundary)
 - (9) Reentry
 - (10) Drill and exercise program
 - (11) Maintaining the emergency plan

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- §50.160

- (c) Requirements

- (2) Hazard analysis (collocation, modularity, industrial)

Licensees and applicants complying with this section must conduct a hazard analysis of any contiguous facility, such as industrial, military, and transportation facilities, and include any credible hazard into the licensee's emergency preparedness program that would adversely impact the implementation of emergency plans.

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- §50.160
 - (c) Requirements
 - (3) Emergency Planning Zone
 - (4) Ingestion response planning
 - Federal, Tribal, state and local capabilities
 - National Response Framework
 - » Federal Interagency Operation Plans
 - » Nuclear/Radiological Incident Annex

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- §50.160
 - (d) Implementation
 - (1) Future applicants must meet the requirements no later than 18 months before the issuance of an operating license.
 - (2) A holder of a combined license must meet the requirements no later than 18 months before fuel loading.

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- Specific Requests for Comments
 - Section IV of the FRN
 - Scope of the proposed rule
 - Performance-based requirements
 - Drills or exercises
 - Planning activities
 - Hazard analysis
 - EPZs

Emergency Preparedness for Small Modular Reactors and Other New Technologies Proposed Rulemaking



- Specific Requests for Comments
 - Section VII Regulatory Analysis
 - Section IX Cumulative Effects of Regulation
 - Section X Plain Writing
 - Section XI Environmental Assessment
 - Section XII Paperwork Reduction Act
 - Draft Regulatory Guide

Licensing Modernization Project



- The LMP's objective is to develop technology-inclusive, risk-informed, and performance-based regulatory guidance for licensing non-LWRs for the NRC's consideration and possible endorsement
- LMP Participants:
 - Southern Company - lead
 - Nuclear Energy Institute - coordination
 - U.S. Department of Energy - cost-sharing
- Integrated approach to licensing basis development
 - Licensing basis event selection
 - Classification of structure, systems, and components
 - Assessment of defense-in-depth
- ACRS public meetings
- Schedule calendar year 2019:
 - DG-1353 - to consider endorsing NEI-18-04 publication

Status and Path Forward



- Proposed rule package is in concurrence:
 - Due to the OEDO on September 28, 2018 and the Commission on October 12, 2018
 - Draft guidance is planned for issuance with proposed rule in early 2019 (pending Commission's approval)
 - Draft final rule due to the Commission for approval in early 2020
- Future ACRS interactions
 - Full committee – October 2018 (proposed rule)
 - Full committee – to be determined (final rule)

Abbreviations



ACRS – Advisory Committee on Reactor Safeguards

CFR – Code of Federal Regulations

COL – combined license

DG – draft regulatory guide

OEDO – Office of the Executive Director of Operations

EP – emergency preparedness

EPZ – emergency planning zone

FEMA – Federal Emergency Management Agency

FRN – Federal Register notice

LMP – Licensing Modernization Project

LWR – light-water reactor

NEI – Nuclear Energy Institute

Abbreviations



NMSS – Office of Nuclear Material Safety and Safeguards

NRC – U.S. Nuclear Regulatory Commission

NRO – Office of New Reactors

NRR – Office of Nuclear Reactor Regulation

NSIR – Office of Nuclear Security and Incident Response

ONT – other new technology

RG – regulatory guide

RIN – Regulation Identification Number

SECY – Office of the Secretary to the Commission

SMR – small modular reactor

SRM – staff requirements memorandum