



## **Proposed Emergency Preparedness for Small Modular Reactors and Other New Technologies Rulemaking**

- Public meeting slides: ADAMS Accession No. ML20154K432
- Webinar Info:  
<https://usnrc.webex.com/usnrc/onstage/g.php?MTID=e85ff6062b780bbf023f5f39d55ec3d44>
- Bridge line: (888) 390-2955; Pass Code: 5504865
- Technical Difficulties? Please email [Glenna.Lappert@nrc.gov](mailto:Glenna.Lappert@nrc.gov)



# **Proposed Emergency Preparedness for Small Modular Reactors and Other New Technologies Rulemaking**

June 24, 2020



# Agenda

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- 1:00pm – 1:10pm: Welcome/Introductions
- 1:10pm – 2:30pm: NRC review/status of Emergency Preparedness (EP) for Small Modular Reactors (SMRs) & Other New Technologies (ONTs) proposed rule
- 2:30pm – 2:45pm: Break
- 2:45pm – 3:50pm: Public discussion of EP for SMRs & ONTs proposed rule
- 3:50pm – 4:00pm: Closure

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# Welcome/Introductions

## Welcome

- Kathryn Brock, NSIR – Director of the Division of Preparedness and Response

## Introductions

- Joan Olmstead, NMSS – Meeting Facilitator
- Bob Beall, NMSS – Rulemaking PM
- Arlon Costa, NRR – Business Line Lead
- Chris Howells, NMSS – Cost Analyst
- Eric Schrader, NSIR – Technical Lead



# Meeting Ground Rules

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- Limit interruptions:
  - Speak one at a time
  - Identify yourself when speaking
    - Please state your name, organization, and your comment or question
- Be respectful of other speakers/participants
- Webinar participants should:
  - Ask questions via the bridgeline during the designated time during today's meeting.
  - Participant lines are muted. The webinar operator will open phone lines during the public discussion period.



# Purpose of Today's Meeting

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- Answer questions on the EP for SMRs & ONTs proposed rule
- Today's meeting is a Category 3 public meeting, which means that public participation is actively sought in the discussion of the regulatory issues during the meeting.
  - The meeting is being transcribed. The transcription will be publicly available with the meeting summary by July 24, 2020.
- This meeting is not designed, nor intended to solicit or receive formal comments on topics in the EP for SMRs & ONTs proposed rule. Also, no regulatory decisions will be made at today's meeting.



# EP for SMRs & ONTs

## Proposed Rule Overview

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- On May 12, 2020, the NRC published the proposed rule in the *Federal Register* for a 75-day public comment period.
- *Federal Register* notice:
  - Regulations.gov docket ID: **NRC-2015-0225**
  - ADAMS Accession No. **ML20133J896**
  - <https://www.govinfo.gov/app/details/FR-2020-05-12/2020-09666>
  - Public comments are due by **July 27, 2020.**
  - See slide 39 for instructions on how to submit comments



# EP for SMRs & ONTs

## Proposed Rule Overview

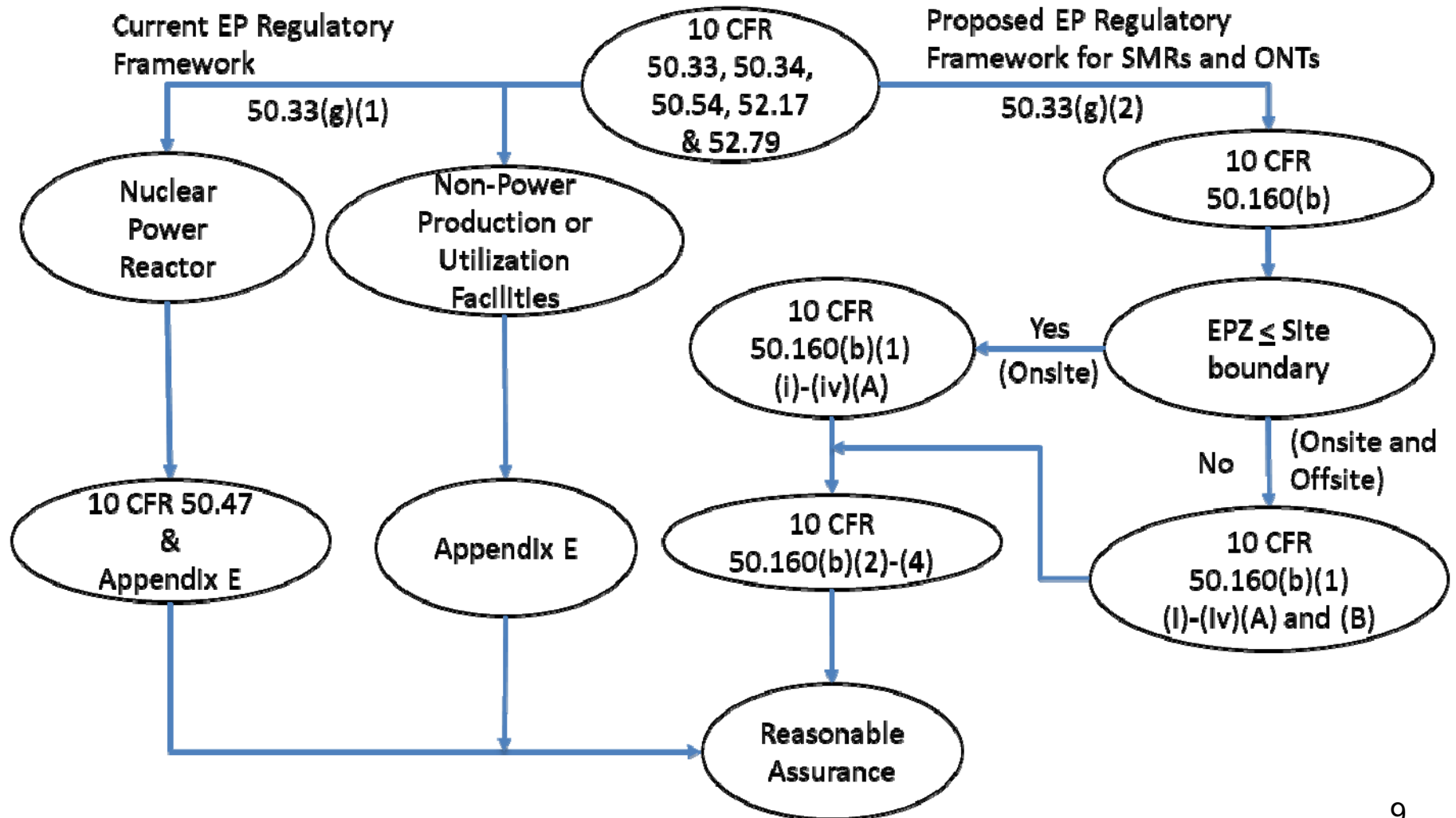
### Major Provisions of the EP for SMRs & ONTs Proposed Rule

1. New alternative performance-based EP framework
2. A hazard analysis of any NRC licensed or non-NRC licensed facility\*
3. Scalable approach for determining the plume exposure pathway EPZ size
4. Requirement to describe ingestion response planning

\* Hazard analysis would be performed by SMRs & ONTs choosing to comply with 10 CFR 50.160.



# 1. New Alternative Performance-Based EP Framework





# 1. New Alternative Performance-Based EP Framework

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- 10 CFR 50.160(b)(1) would establish a new alternative performance-based EP framework
  - (i) Maintenance of Performance
  - (ii) Performance Objectives
  - (iii) Emergency Response Performance
  - (iv) Planning Activities



## **2. A Hazard Analysis of Any NRC Licensed or Non-NRC Licensed Facility**

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- 10 CFR 50.160(b)(2) would require a hazard analysis of facilities contiguous or nearby to an SMR or ONT.
- DG-1350 includes guidance on hazard analyses for contiguous or nearby facilities.

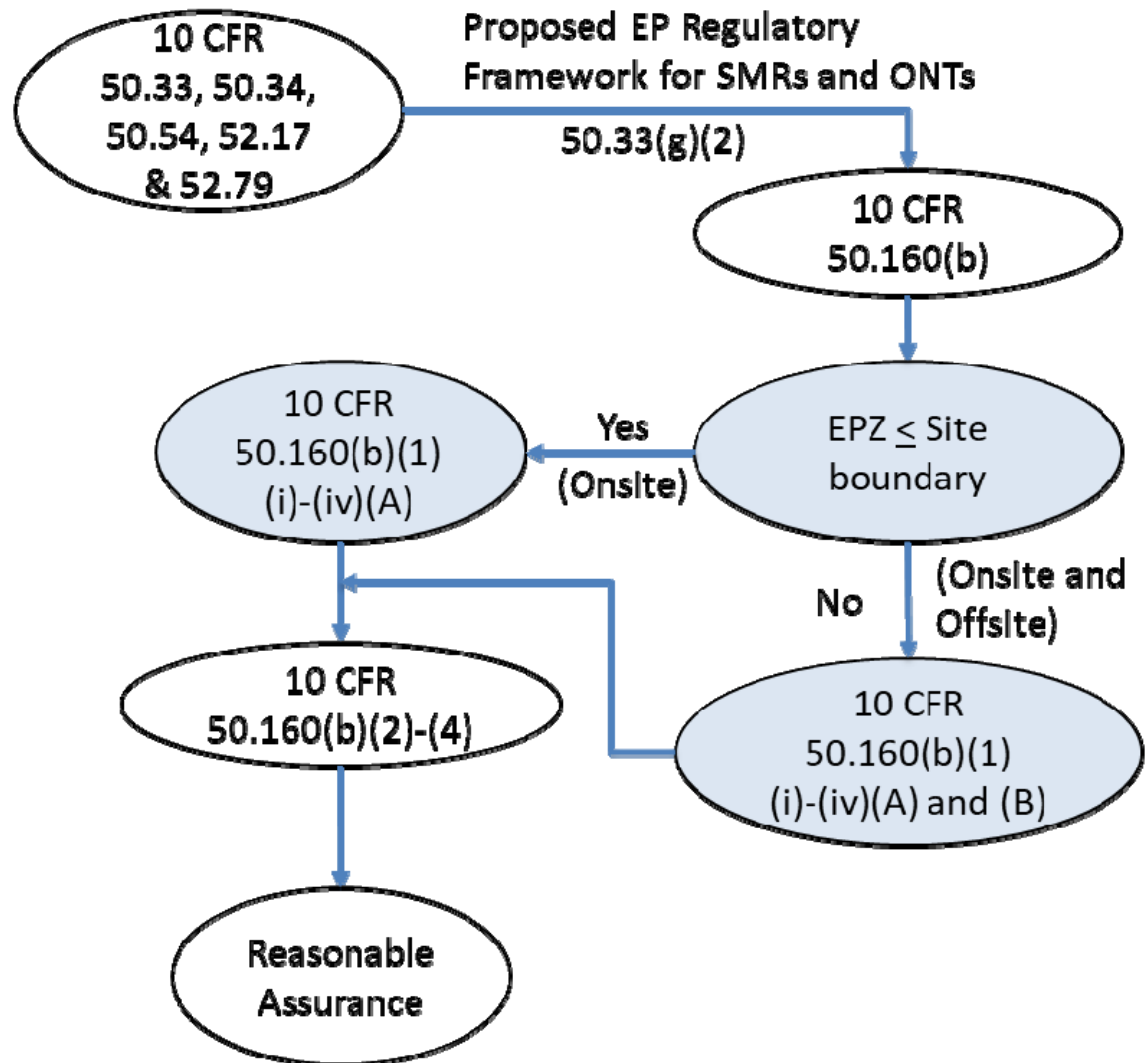


### 3. Scalable Approach for Determining Plume Exposure Pathway EPZ Size

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- Plume exposure pathway EPZ would be area within which public dose, as defined in 10 CFR 20.1003, is projected to exceed 10 mSv (or 1 rem) TEDE over 96 hours from the release of radioactive materials resulting from a spectrum of credible accidents for the facility.
- DG-1350 includes general guidance for determining the plume exposure pathway EPZ size.

# 3. Scalable Approach for Determining Plume Exposure Pathway EPZ Size





## 4. Requirement to Describe Ingestion Response Planning

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- 10 CFR 50.160(b)(4) would establish ingestion response planning requirements.
- Applicants and licensees would describe:
  - Ingestion response planning
  - Capabilities and resources available to prevent contaminated food and water from entering the ingestion pathway

# Draft Regulatory Guide

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- Draft Regulatory Guide (DG–1350), “Performance-Based Emergency Preparedness for Small Modular Reactors, Non-Light Water Reactors, and Non-Power Production or Utilization Facilities” issued for comment
  - Appendix A provides a sample methodology acceptable to the NRC for the analysis for establishing plume exposure pathway EPZ size
  - Appendix B provides guidance to support radiological dose assessment for plume exposure pathway EPZ size evaluations
- ADAMS Accession No. ML18082A044

# Regulatory Analysis

- Costs and Cost Savings (Undiscounted)

	Licensee	NRC
Implementation Costs	(\$149,000)	(\$650,000)
Operations Cost Savings	\$12.59 million	\$4.51 million
Net Benefits (Cost Savings – Costs)	\$12.44 million	\$3.86 million

- Total Net Benefit (Undiscounted): \$16.30M
  - 3 Percent discounting: \$9.71M
  - 7 Percent discounting: \$5.89M
- ADAMS Accession No. ML20041C826



- Flexibility for scalable plume exposure pathway EPZ would result in:
  - Averted exemption request costs to the NRC and Industry
    - \$1.30M (7% discount rate)
    - \$1.37M (3% discount rate)
  - Averted LAR costs to the NRC and Industry
    - \$4.95M (7% discount rate)
    - \$8.68M (3% discount rate)
  - Simplified EP plan benefits to the NRC and Industry
    - \$468,000 (7% discount rate)
    - \$490,000 (3% discount rate)

# Regulatory Analysis

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- Proposed rule would allow license applicants to use probabilistic risk assessment (PRA) to select the EPZ source term for the EPZ boundary:
  - Requires a PRA of acceptable scope, level of detail, and degree of realism to produce source terms
  - May result in additional licensee costs that are not quantified in the regulatory analysis if existing PRAs are insufficient



# Backfitting and Issue Finality

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- Proposed rule and implementing guidance would not be subject to the NRC's backfitting or issue finality regulations.
- New alternative requirements would not be imposed upon applicants and licensees and would not prohibit applicants and licensees from following existing requirements.



# Environmental Assessment and Information Collections

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- Environmental assessment: Finding of no significant impact on the quality of the human environment from this action
  - ADAMS Accession No. ML20041C892
- Information collections (i.e., OMB Statement): recordkeeping and reporting
  - 10 CFR Part 50: ADAMS Accession No. ML18184A308
  - 10 CFR Part 52: ADAMS Accession No. ML18184A309



# Specific Requests for Comments

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- The NRC is seeking comments and supporting rationale from the public on eight topics.
- On the following slides, the staff has added topic numbers (T#) and question numbers (Q#) to the specific requests for comments published in the FRN.
- For each question, commenters are asked to provide the basis for responses.



# Discussion of Specific Questions

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## Terminology used to describe the requirements (T1-Q1)

- Proposed rule uses “dose-based” and “consequence-oriented”
- Commission uses overarching term “risk-informed”
  - Q1: Would such a change impact the clarity and predictability of the regulations? (FRN pg. 28452)



# Discussion of Specific Questions

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## Scope of the proposed rule (T2-Q1)

- Large LWRs not in the scope of proposed rule
- NRC is open to considering a performance-based approach to EP for large LWRs, fuel cycle facilities, and currently operating NPUFs.
  - Q1: Are the proposed “non-light-water reactor,” “non-power production or utilization facility,” and “small modular reactor” definitions in § 50.2 sufficient to address EP for existing and anticipated technologies? (FRN pg. 28453)



# Discussion of Specific Questions

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## Scope of the proposed rule (T2-Q2)

- Large LWRs not in the scope of proposed rule
- NRC is open to considering a performance-based approach to EP for large LWRs, fuel cycle facilities, and currently operating NPUFs.
  - Q2: Are there any unintended consequences of including each of these classes of facilities within the scope of this proposed rule? (FRN pg. 28453)





# Discussion of Specific Questions

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## Scope of the proposed rule (T2-Q3)

- Certain facilities are not in the scope of proposed rule.
  - Q3: Should the NRC consider a performance-based, consequence-oriented approach to EP for entities besides SMRs and ONTs (e.g., large LWRs, fuel cycle facilities, and currently operating NPUFs) in a future rulemaking? (FRN pg. 28453)



# Discussion of Specific Questions

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## Scope of the proposed rule (T2-Q4)

- Certain facilities not in the scope of proposed rule.
  - Q4: If the NRC considers a performance-based, consequence-oriented approach to EP for entities other than SMRs and ONTs, what criteria should such entities be required to meet to use a performance-based, consequence-oriented approach to EP in a future rulemaking? (FRN pg. 28453)



# Discussion of Specific Questions

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## Scope of the proposed rule (T2-Q5)

- Certain facilities not in the scope of proposed rule.
  - Q5: If the NRC does not consider a performance-based, consequence-oriented approach to EP for entities other than SMRs and ONTs, should the NRC offer mechanisms (other than the existing exemption process) that would allow other entities to request NRC approval to use the EP framework proposed in this rulemaking? If so, what mechanisms? (FRN pg. 28453)



# Discussion of Specific Questions

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## Performance-based requirements (T3-Q1)

Applicants and licensees choosing to comply with the performance-based approach would demonstrate the emergency response functions in § 50.160(b)(1)(iii) through drills or exercises and performance objectives.

- Q1: Are there additional emergency response functions that the NRC should consider for incorporation in this proposed rulemaking? (FRN pg. 28453)



# Discussion of Specific Questions

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## Drills or exercises (T4-Q1 & T4-Q2)

Under § 50.160(b)(1), applicants and licensees would need to develop a drill and exercise program to demonstrate compliance with performance-based requirements.

- Q1: Would an 8-year exercise cycle (as is currently required for large LWRs) be appropriate for SMRs or ONTs choosing to comply with the performance-based approach? (FRN pg. 28453)
- Q2: If not, would an alternative cycle length be appropriate? (FRN pg. 28453)



# Discussion of Specific Questions

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## Planning activities (T5-Q1)

There are four planning activities under § 50.160(b)(1)(iv)(A) and 11 offsite planning activities under

§ 50.160(b)(1)(iv)(B) for cases where the EPZ extends beyond the site boundary.

- Q1: Are there any planning activities that should be added to or removed from the NRC's proposed list? (FRN pg. 28453)



## Discussion of Specific Questions

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### **Hazard analysis for contiguous or nearby facilities (T6-Q1)**

- Q1: To what extent should this analysis be harmonized with or rely upon the analysis conducted under 10 CFR 100.20, “Factors to be considered when evaluating sites,” for man-related hazards? (FRN pg. 28453)



## Discussion of Specific Questions

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### **Hazard analysis for contiguous or nearby facilities (T6-Q2)**

- Q2: What kinds of facilities might be located contiguous or nearby to SMRs or ONTs? (FRN pg. 28453)





## Discussion of Specific Questions

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### **Hazard analysis for contiguous or nearby facilities (T6-Q3)**

- Q3: Should the NRC change the scope of the hazard analysis? If so, how should the scope of the hazard analysis change? (FRN pg. 28453)



# Discussion of Specific Questions

## Emergency planning zones (T7-Q1)

10 CFR 50.160 uses a 10 mSv (1 rem) TEDE over 96 hours criterion for an analysis to establish a site-specific plume exposure pathway EPZ size.

- Q1: Is the proposed 10 mSv (1 rem) criterion appropriate? Are there particular factors and technical considerations that need to be included in an EPZ size analysis? (FRN pg. 28453)



# Discussion of Specific Questions

## Emergency planning zones (T7-Q2)

10 CFR 50.160 uses a 10 mSv (1 rem) TEDE over 96 hours criterion for an analysis to establish a site-specific plume exposure pathway EPZ size.

- Q2: If the analysis demonstrates that the EPZ is within the facility's site boundary, would the need for a dedicated, Federal-mandated offsite radiological emergency preparedness program exist? (FRN pg. 28453)



# Discussion of Specific Questions

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## Emergency planning zones (T7-Q3)

10 CFR 50.160 uses a 10 mSv (1 rem)

TEDE over 96 hours criterion for an analysis to establish a site-specific plume exposure pathway EPZ size.

- Q3: If the applicant or licensee provides an adequate description of the existing Federal, Tribal, State, and local Federal capabilities to interdict contaminated food and water, would the need for an IPZ exist? (FRN pg. 28453)



# Discussion of Specific Questions

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## Costs (T8-Q1)

- Q1: The NRC is seeking information on the incremental cost estimates for any additional PRA modeling necessary to generate the credible accident sequences and the development of the source terms used in determining a site-specific EPZ size. (FRN pg. 28453)



# EP for SMRs & ONTs Proposed Rule

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# Public Discussion of EP for SMRs & ONTs Proposed Rule

- Ask questions via the bridgeline



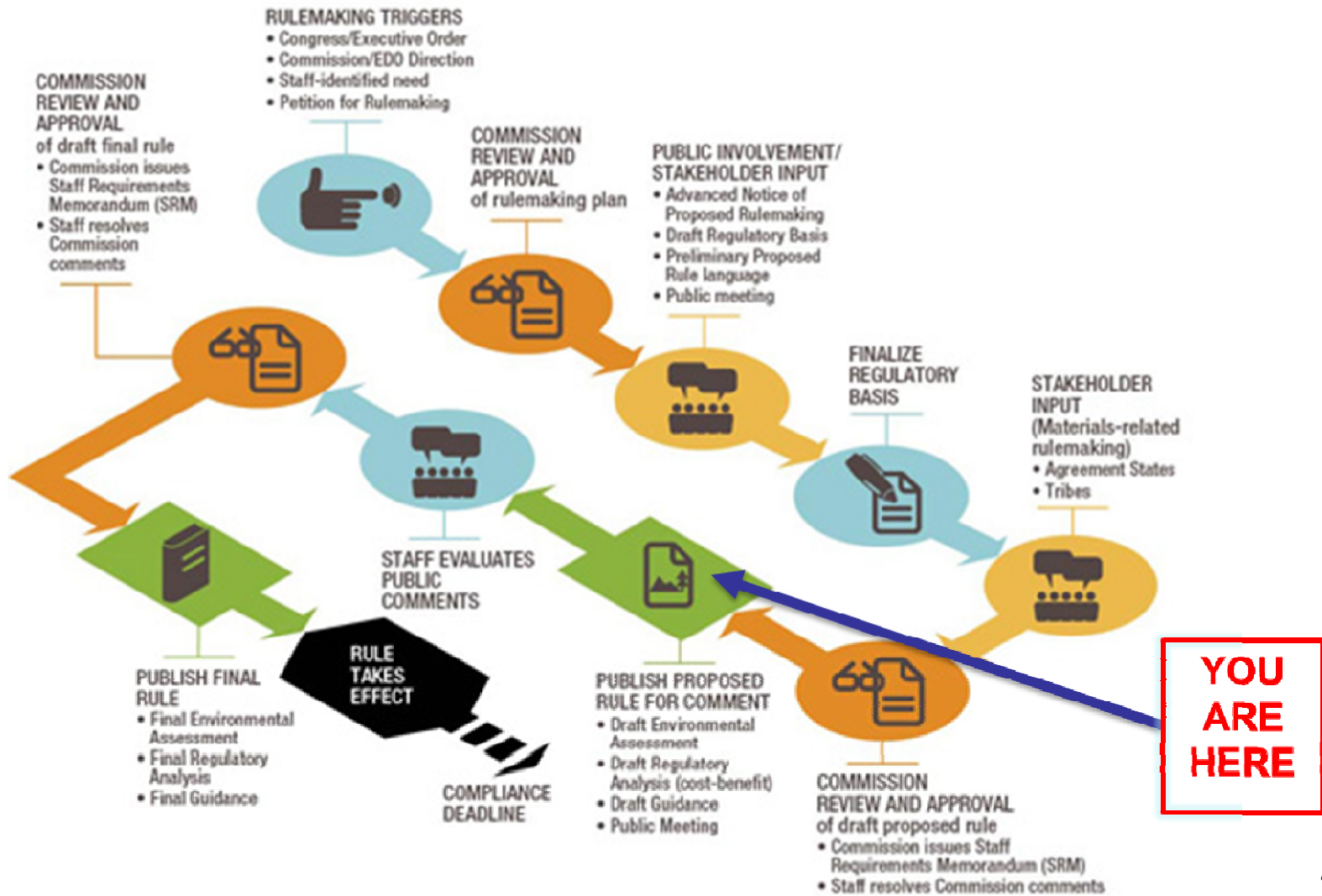
# Public Comments on Proposed Rule

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- Public comments need to be submitted **by July 27, 2020**.
- Public comments collected via:
  - **Online:** [www.regulations.gov](http://www.regulations.gov) (Preferred Method)
    - Search for Docket ID: **NRC-2015-0225**
  - **Email:** [Rulemaking.Comments@nrc.gov](mailto:Rulemaking.Comments@nrc.gov)
  - **Mail:** Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Rulemakings and Adjudications Staff
  - **Hand Delivery: None**
  - **Fax: None**

# EP for SMRs & ONTs Proposed Rule

## A TYPICAL RULEMAKING PROCESS





# Closing Remarks

## Rulemaking Contacts

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301-287-3789

Please provide feedback on this public meeting using this link:

<https://www.nrc.gov/public-involve/public-meetings/contactus.html>



# U.S. NRC Acronyms and Abbreviations

UNITED STATES NUCLEAR REGULATORY COMMISSION  
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ADAMS	Agencywide Documents Access and Management System	Non-LWR	Non-light water reactor
CFR	Code of Federal Regulations	NPUF	Non-power production or utilization facility
DG	Draft regulatory guide	NRC	U.S. Nuclear Regulatory Commission
EP	Emergency preparedness	NRR	Office of Nuclear Reactor Regulation
EPZ	Emergency planning zone	NSIR	Office of Nuclear Security and Incident Response
FRN	<i>Federal Register</i> notice	ONT	Other new technology
IPZ	Ingestion pathway zone	PRA	Probabilistic risk assessment
LAR	License amendment request	rem	Roentgen equivalent man
LWR	Light water reactor	SMR	Small modular reactor
M	Millions	TEDE	Total effective dose equivalent
mSv	milliSieverts		
NMSS	Office of Nuclear Material Safety and Safeguards		