

Emergency Preparedness for Small Modular Reactors and Other New Technologies Performance-Based Approach

Public Meeting
August 22, 2016

Agenda

1:00-1:15	Welcome <ul style="list-style-type: none">• Logistics, Introductions and Purpose
1:15-2:00	Background on EP for SMRs and ONTs Rulemaking <ul style="list-style-type: none">• SMRs, non-LWRs and Medical Isotope Production and Utilization Facilities• Staff Papers and Stakeholder Engagement• Commission Direction
2:00-2:45	Performance-Based EP Approach for This Rulemaking <ul style="list-style-type: none">• Comparisons between Prescriptive and Performance-Based approaches to EP• Advantages and Disadvantages
2:45-3:45	Discussion and Feedback
3:45-4:00	Meeting Summary and Closure

Welcome
Meeting Logistics
Introductions
NRC Staff
NGOs in attendance
Members of the public
Phone participants

Purpose

The purpose of this public meeting is to provide a forum for discussing an approach using performance-based concepts for rulemaking for emergency preparedness (EP) for small modular reactors (SMRs) and other new technologies (ONTs).

Background

08/19/2016

Final Slides

5

Background

This presentation may not reflect the final approach by the NRC in the development of the regulatory basis, guidance, and proposed and final rules.

Background

- Why are we considering a performance-based approach to EP?
- Commission directive (SRM-SECY-16-0077)
 - Interest by applicants in the licensing, construction, and operation of SMRs, non-light-water reactors (non-LWRs), and ONTs
 - Large LWRs, research and test reactors are not in the scope of this rulemaking.

Background

Staff Papers and Stakeholder Engagement

- [SECY-11-0152](#)

Commission Direction

- [SRM-SECY-15-0077](#)
- [SRM-SECY-16-0069](#)

Background

Rulemaking

- Addresses advanced technology in reactor plant designs
- Includes EP for medical isotope production facilities
- Provides guidance to facilitate the implementation of the rule
- Maintains adequate protection of public health and safety

Background

Small Modular Reactors (SMRs)

- Generally, each SMR
 - Is less than 300 megawatts electric power
 - Is built in factories and delivered to site
 - Has passive safety features, smaller core size and source term
- Can add modules as power needs increase
- NuScale design certification application expected in 2016
- EP will be required as is appropriate for design and spectrum of accidents

Background

- **Non-light Water Reactors**
 - Gas-cooled reactors
 - Molten salt reactors
 - Liquid metal reactors
- **Many designs have lower operating pressures as compared to large LWRs**
- **Currently, no applicant**

Background

Medical Isotope Production and Utilization Facilities

- Two construction permit (CP) applications submitted
 - SHINE Medical Technologies (CP granted)
 - Northwest Medical Isotopes (CP under review)

Background

EP for SMRs and ONTs

- Proposed advanced designs require new thinking
- Emergency planning zone (EPZ) size – informed by postulated offsite dose consequences
 - EPA Protective Action Guides (PAGs)
 - EPZ size could vary
- 10 CFR Part 100, Reactor Site Criteria – not in the scope of this rulemaking

Performance-Based EP Approach

Performance-Based EP Approach

- EP as it exists now
 - Post-TMI U2
 - Reassessed after significant industry events
 - Browns Ferry fire
 - TMI U2
 - Chernobyl
 - 9/11
 - Fukushima
 - Relies on methods or processes
- EP by Design
 - EP is included as an element of reactor and plant design
 - Technological advances
 - Leverages new designs
 - Based on advances in reactor studies
 - Relies on demonstrating results

Performance-Based EP Approach

Difference Between Approaches:

Prescriptive

- Specifies features, actions and programmatic elements
- Defines process and design to achieve goal
- Licensee responsible for meeting prescribed methods and features

Performance-Based

- Focuses on measurable outcomes
- Provides flexibility on the process or design
- Licensee responsible for design, methods and performance.

Performance-Based EP Approach

An Example:

Prescriptive: Adequate methods, systems, and equipment for assessing and monitoring actual or potential consequences of a radiological emergency condition are in use onsite.

Performance-Based: The licensee must access and monitor the radiological consequences resulting from deviations from normal operations.

Performance-Based EP Approach

The NRC has issued other performance-based rules and the Reactor Oversight Program

- Maintenance Rule (10CFR50.65)
- Station Blackout Rule (10CFR50.63)
- Reactor Oversight Program
 - Strategic performance areas are cornerstones that reflect the essential safety aspects of facility operation

Discussion and Feedback

08/19/2016

Final Slides

19

Discussion and Feedback

What activities would go into performance-based EP, for example:

- Classification
- Notifications
- Protective actions
- Assessment
- Others?

Discussion and Feedback

What activities should be evaluated, for example:

- Drills and Exercises
- Performance Indicators
- Consequence-oriented activities?
- Frequency?

Discussion and Feedback

Is a system similar to the Reactor Oversight Process and the EP Cornerstone appropriate?

For example:

- Oversight—Regulatory Response to EP Performance
 - Performance levels
 - Green Performance Band
 - White Performance Band
 - Yellow Performance Band

Discussion and Feedback

- What do you perceive as the advantages?
- What do you perceive as the disadvantages?

Meeting Summary and Closure

08/19/2016

Final Slides

24

Meeting Summary and Closure

Next Steps

- **Draft Regulatory Basis**
 - Publication of the draft regulatory basis planned for December, 2016
 - A public meeting planned for first quarter, 2017
- **Final Regulatory Basis**
- **Draft Rule with draft guidance**
- **Final Rule with final guidance**
- **Rulemaking Expected to be completed in 2020**

References, not all inclusive

- [SECY-93-0092 \(and SRM\)](#)
- [SECY-10-0034 \(No SRM\)](#)
- [SECY-11-0152 \(No SRM\)](#)
- [SECY-14-0038 \(and SRM\)](#)
- [SECY-15-0077 \(and SRM\)](#)
- [SECY-16-0069 \(and SRM\)](#)
- [NUREG-0396 \(EPA 520/1-78-016\)](#)
- [NUREG/CR-7195](#)
- [NUREG/BR-0303](#)
- [NUREG-0654/FEMA-REP-1](#)
- [EPA-400-R-92-001](#)

Information Sites

- NRC website for rulemaking
 - <http://www.nrc.gov/about-nrc/regulatory/rulemaking.html>
- Regulations.gov
 - <https://www.regulations.gov/>

Contacts

Arlon Costa, Project Manager

Arlon.Costa@nrc.gov

301-415-6402

Cindy Rosales-Cooper, Project Manager

Cindy.Rosales-Cooper@nrc.gov

301-287-9500

Kenneth Thomas, EP Specialist

Kenneth.Thomas@nrc.gov

301-287-9525