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

NRC Emergency Preparedness Rulemaking Activities

Tri-State Directors Meeting
Framingham, MA
May 8, 2019

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What is Emergency Preparedness?

- EP is a defense-in-depth program
- EP is the last line of defense
- EP addresses a spectrum of potential accidents
- EP requires constant state of readiness
- The scope and nature of the preparedness depends on the potential hazards presented by the class of facility

What is changing and why?

- EPZ size and other radiological emergency preparedness (REP) Program capabilities should be proportional to the risk without undue regulatory burden on licensees
- Performance-based emergency preparedness (EP) and scalable EPZ size commensurate with risk
- Ingestion planning capabilities rather than defined zone
- New designs/technologies are including additional features to meet the expectations of the Commission Policy Statement on Advanced Reactors, issued in 2008
- NRC as a matter of long standing principle has licensed facilities such as research and test reactors, reactors at low power operation, and fuel facilities with EPZs that do not require an off-site REP program

Philosophy of EP

The overall objective of EP is to provide dose savings for a spectrum of accidents that could produce offsite doses in excess of Protective Action Guides.

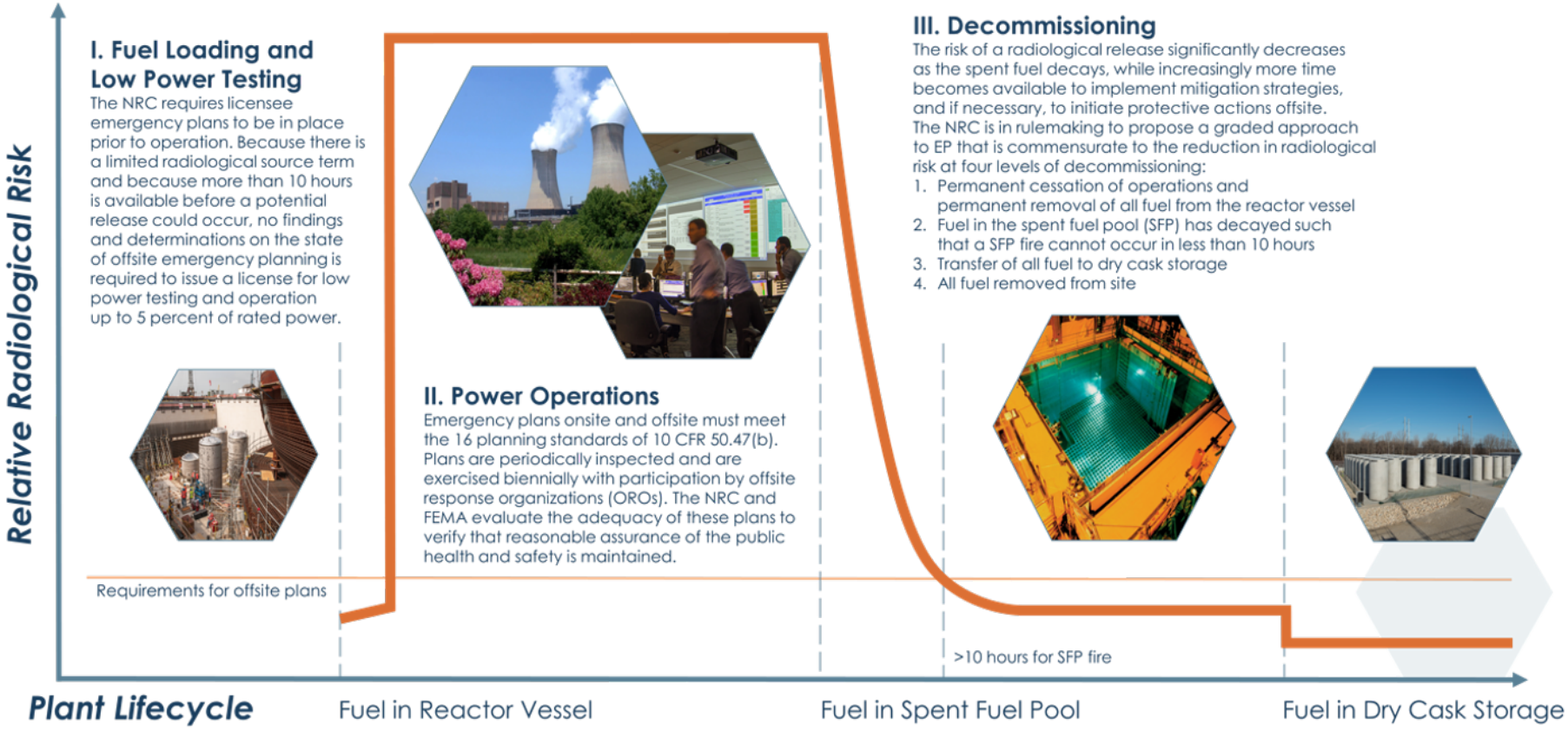
EPZs are areas for which planning is needed to assure that prompt and effective actions can be taken to protect the public in the event of an accident.

How is this applied in rulemaking?

Rulemaking Goals for EP

- Maintain reasonable assurance of adequate protection of the public health and safety
- Maintain EP as an independent layer of defense-in-depth
- Provide regulatory certainty and clarity
- Gain efficiencies from previous efforts
    - Exemption requests
    - Prior decommissioning rulemaking efforts
    - Supporting studies

Illustrative Milestones

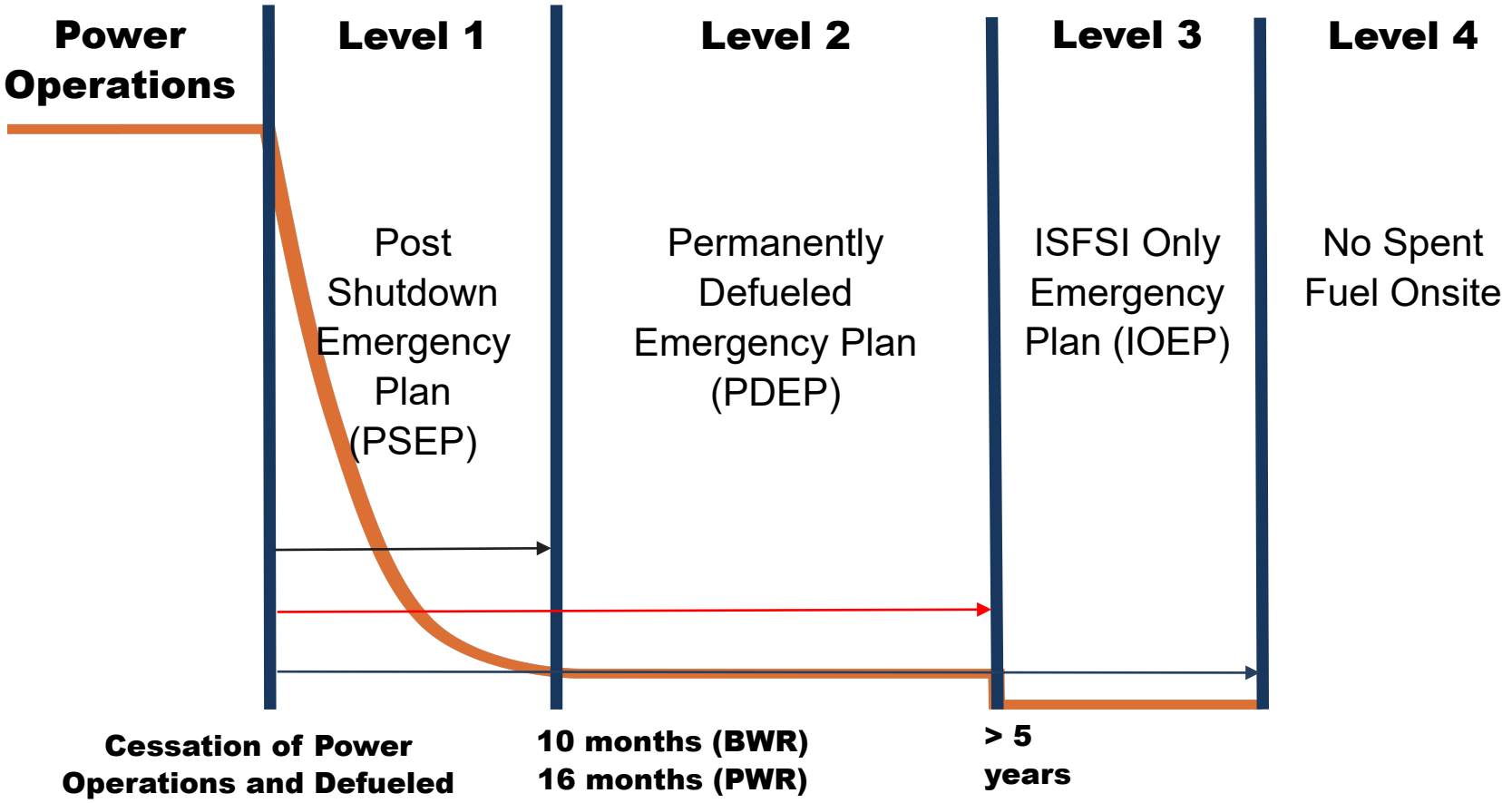


Supporting Research

Three recent analyses that support the planning basis for EP:

- *Analysis of Mitigative Actions*
- *Spent Fuel Decay Time*
- *Dose Rate of Accidental Radiological Release from Spent Fuel Pool*

Graded Approach to EP



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EP Basis for Decommissioning Sites

The overall objective of EP is to provide dose savings for a ***spectrum of accidents*** that could produce ***offsite doses in excess of PAGs***.

EPZs are areas for which planning is needed to assure that ***prompt*** and effective actions can be taken to protect the public in the event of an accident.

For example, in Level 2 decommissioning:

- **The spectrum of accidents are fewer**
- **DBAs will not exceed 1 Rem offsite**
- **At least 10 hours available before a SFP fire could occur**

Decommissioning Rulemaking

- Proposed graded approach to EP
  - Establishes requirements commensurate with radiological risk
  - Minimizes licensing actions and maintains reasonable assurance
  - Upholds EP as an independent layer of defense-in-depth
- Coordination with offsite agencies maintained
  - Arrangements for offsite services support
  - Communications maintained and tested periodically
  - Annual review of Emergency Action Levels (EALs)
  - Radiological orientation training program for local services
  - Voluntary participation in exercises
  - 10 CFR 50.54(t) evaluation of State and local interfaces

Decommissioning Rule Schedule

- Final Regulatory Basis
  - November 2017, ML17215A012
- Proposed Rule/Draft Regulatory Guidance
  - Provided to Commission May 7, 2018
  - Public May 22, 2018, ADAMS Package ML18012A019
- Public Comment Period (current estimate)
  - June 28, 2019
- Final Rule/Final Regulatory Guidance
  - August 31, 2020, Provide to Commission
  - March 15, 2021, Issue Final
- Regulations.gov Docket ID NRC-2015-0070

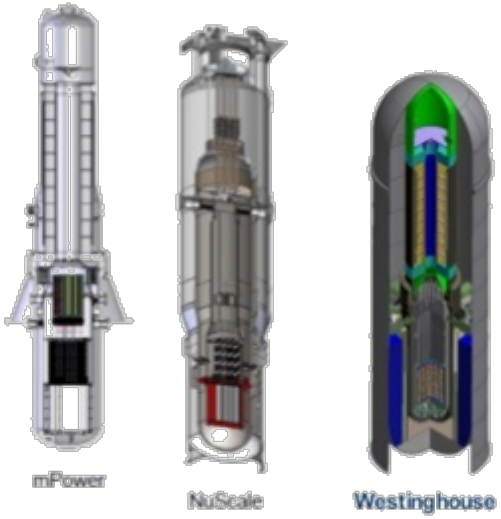
EP for SMRs & ONT

- Rulemaking to develop a clear set of rules and guidance for small modular reactors (SMRs) and other new technologies (ONT)

Technology Neutral

Risk-Informed, Performance Based

Principle of dose-at-distance and consequence-oriented approach to determine EPZ size



- New designs/technologies are including features to enhance the margin of safety through use of simple, inherent, or passive means to accomplish their safety and security functions.

Commission Policy Statement on Advanced Reactors

"the Commission expects, as a minimum, at least the same degree of protection of the environment and public health and safety and the common defense and security that is required for current generation light-water reactors (LWRs)…
the Commission expects that advanced reactors will provide **enhanced** margins of safety and/or use **simplified, inherent, passive, or other innovative means** to accomplish their safety and security functions." (emphasis added)

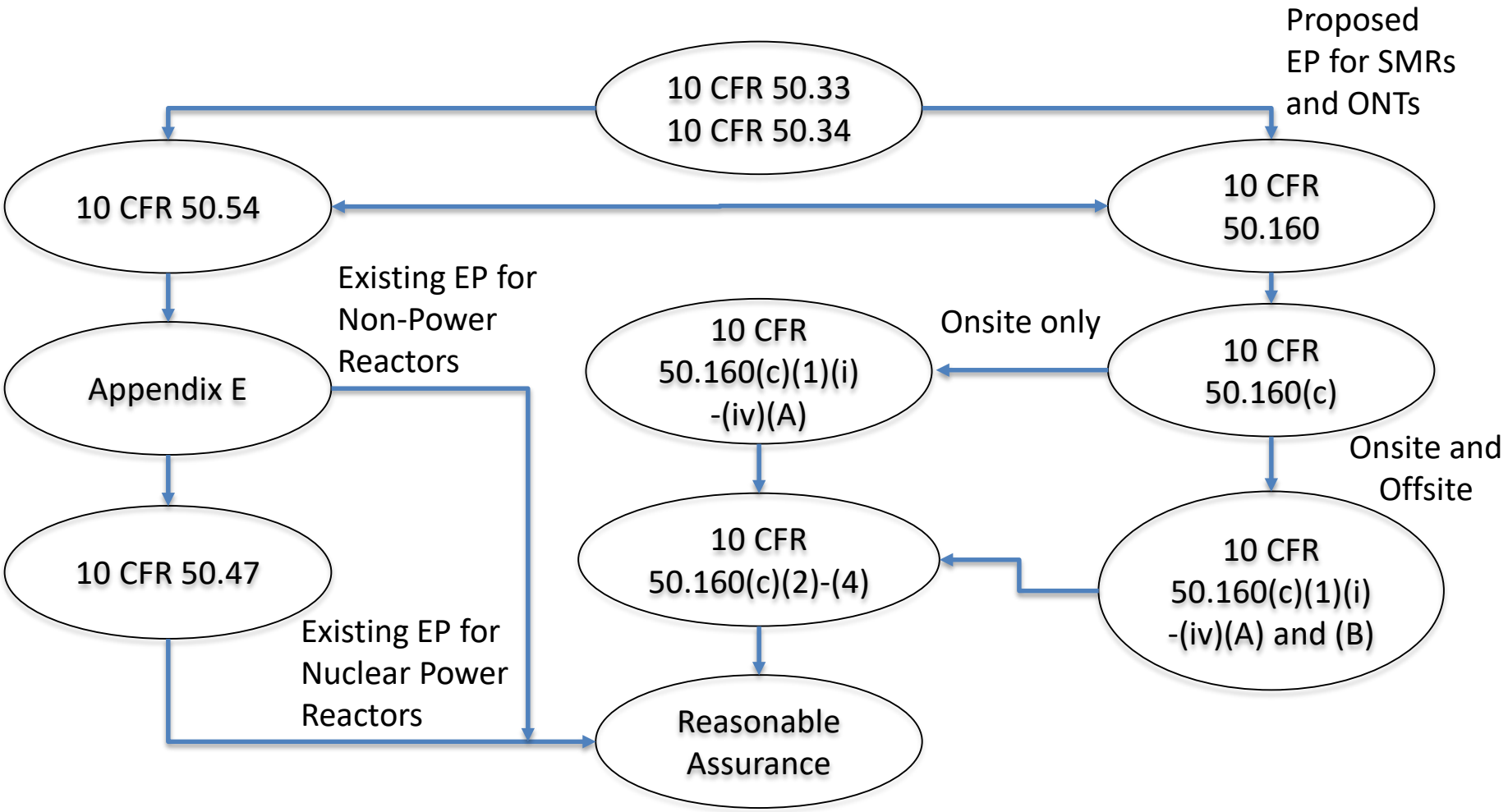
Major Provisions

- Technology-inclusive for future SMRs and ONTs, including medical radioisotope facilities and non-light-water reactors
- 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 planning capabilities rather than defined zone

Scalable EPZ

- Scalable approach for plume exposure pathway EPZ
  - Consistent with the analyses documented in NUREG-0396
  - EPA PAG manual supports the EPZ-PAG and planning relationship
  - Consistent with the existing graded-approach afforded to:
    - Research and test reactors
    - Fuel cycle facilities
    - Independent spent fuel storage installations
- Same level of protection afforded to public health and safety
- Development of guidance supported by Office of Nuclear Regulatory Research

Framework


10 CFR 50.33
10 CFR 50.34
Proposed EP for SMRs and ONTs
10 CFR 50.54
10 CFR 50.160
Existing EP for Non-Power Reactors
Appendix E
10 CFR 50.160(c)(1)(i)-(iv)(A)
Onsite only
10 CFR 50.160(c)
Onsite and Offsite
10 CFR 50.47
10 CFR 50.160(c)(2)-(4)
10 CFR 50.160(c)(1)(i)-(iv)(A) and (B)
Existing EP for Nuclear Power Reactors
Reasonable Assurance

Emergency Response Performance

- Event Classification and Mitigation
- Assessment
- Protective Actions
- Communications
- Command and Control
- Staffing and Operations
- Protective Equipment
- Releases
- Reentry
- Critique and Corrective Actions

Planning Activities

- All Facilities:
  - Public Information
  - Implementing Safeguards Contingency Plan at the same time as the Emergency Plan
  - Establish Voice Communications with the NRC
  - Establish Emergency Facilities

Offsite Planning Activities

- For those facilities that have an EPZ beyond the site boundary
  - Contacts and Arrangements
  - Offsite organizations descriptions
  - Protective measures
  - Site familiarization training
  - Evacuation time estimates
  - Offsite emergency response facilities
  - Dose projections
  - Public information, ANS, prompt action descriptions
  - Reentry
  - Drills and exercises

SMR/ONT Rule Schedule

- Final Regulatory Basis
  - September 2017, ML17206A265
- Proposed Rule/Draft Regulatory Guidance
  - Provided to Commission October 12, 2018
  - Public August 3, 2018, ADAMS Package ML18213A264
- Public Comment Period (current estimate)
  - June 28, 2019
- Final Rule/Final Regulatory Guidance
  - March 27, 2020, Provide to Commission
  - July 27, 2020, Issue Final
- Regulations.gov Docket ID NRC-2015-0225

Changes

Reactor technology is advancing,
EP is evolving,
but the NRC's mission to protect the health and safety of the public remains unchanged