

**FREQUENTLY ASKED QUESTIONS AND ANSWERS
FOR
RULEMAKING ON EMERGENCY PREPAREDNESS FOR SMALL MODULAR REACTORS
AND OTHER NEW TECHNOLOGIES**

Question 1: What is the U.S. Nuclear Regulatory Commission?

Answer: The U.S. Nuclear Regulatory Commission (NRC) is an independent agency with the primary duty to regulate the civilian use of nuclear materials. The NRC implements its duty through such actions as issuing licenses and regulations governing the safe use of these materials. The NRC oversees such issues as siting, design, construction, operation, decommissioning, and ultimate shutdown of nuclear power plants, uranium mills, fuel facilities, waste repositories, and transportation systems. The NRC also regulates other uses of nuclear materials, such as nuclear medicine programs at hospitals, academic activities, research work, industrial applications such as the use of gauges and testing equipment, and the import and export of nuclear materials and technologies. However, the NRC does not regulate military uses of radioactive material or certain Department of Energy nuclear facilities.

Question 2: Which regulations apply to emergency preparedness (EP) for currently licensed nuclear power plants?

Answer: The following regulations govern EP:

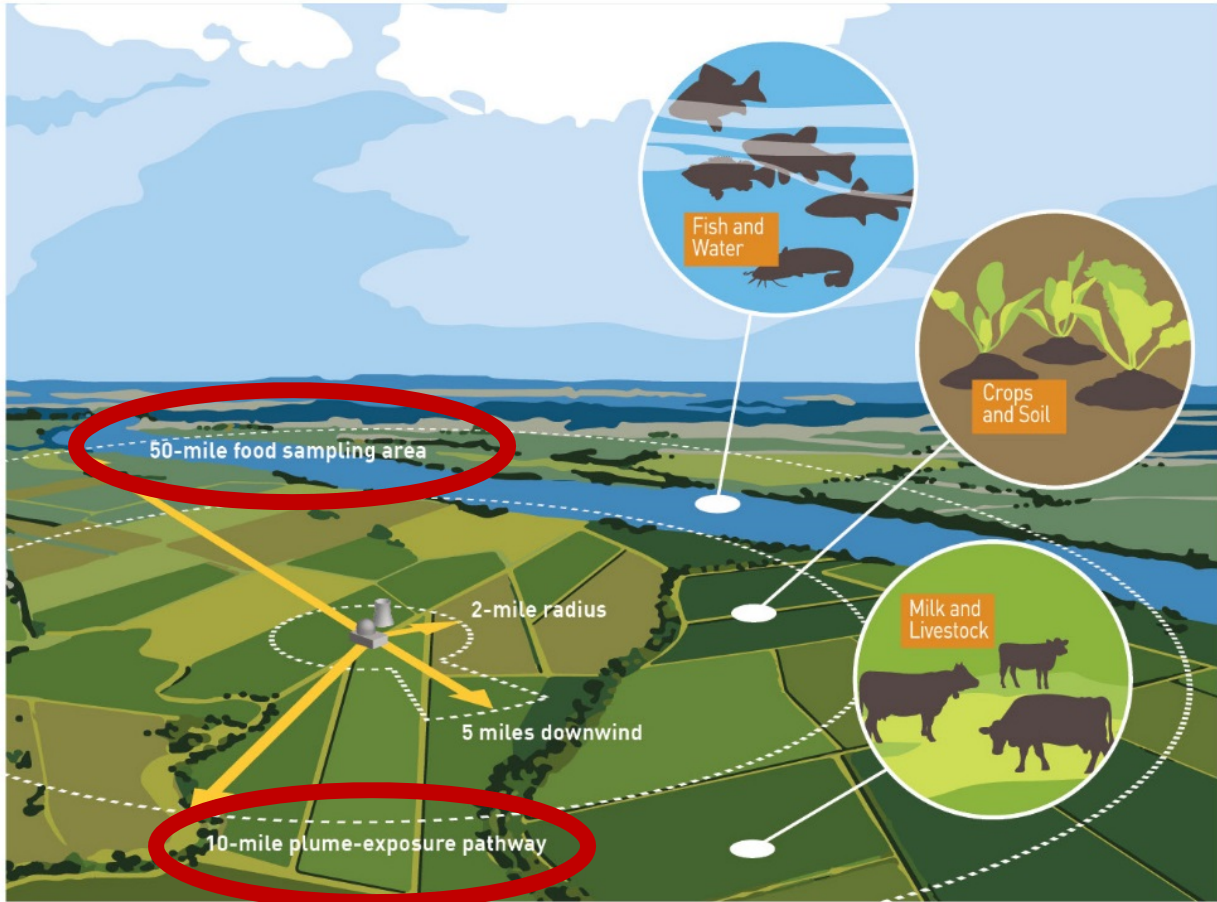
- For nuclear facilities licensed (or applying to be licensed) under Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, “Domestic Licensing of Production and Utilization Facilities”:
 - 10 CFR 50.33, “Contents of application; general information.”
 - 10 CFR 50.34, “Contents of application; technical information.”
 - 10 CFR 50.47, “Emergency plans.”
 - 10 CFR 50.54, “Conditions of license.”
 - 10 CFR Part 50, Appendix E, “Emergency Planning and Preparedness for Production and Utilization Facilities.”
- For nuclear facilities licensed (or applying to be licensed) under 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants”:
 - 10 CFR 52.17, “Contents of application; technical information.” [for an early site permit]
 - 10 CFR 52.79, “Contents of application; technical information in final safety analysis report.” [for a combined license]

Question 3: What is the key issue in this proposed rulemaking?

Answer: Among other important issues about EP, central to the framework is the determination of the emergency planning zones (EPZs). These areas are determined in advance to aid emergency response organizations in carrying out public protective actions in case of a radiological accident at a nuclear power plant. The NRC currently requires, in general, a 10-mile (16-kilometer) plume exposure pathway EPZ and a 50-mile (80-kilometer) ingestion pathway EPZ, also referred to as IPZ in this proposed rule, for large light-water reactors (LWRs). The EPZ and IPZ were developed for large LWRs and considered, among other elements, the source of potential releases would be from the large reactor cores. The nuclear industry has indicated that it intends to apply for the authorization to construct and operate reactors that have cores approximately 10 times smaller than those of current large LWRs.

These relatively smaller cores would potentially have a smaller source term, contributing to a smaller possible dose to the public, which would be used in the calculation for determining a potentially reduced EPZ boundary distance. In addition, the advanced reactor designers that have expressed interest to the NRC may or may not use cores smaller than the current large LWRs, but their designs appear to result in fewer offsite consequences should a credible accident occur.

Emergency Planning Zones (as currently depicted in regulations and guidance)



Note: A 2-mile ring around the plant is identified for evacuation, along with a 5-mile zone downwind of the projected release path.

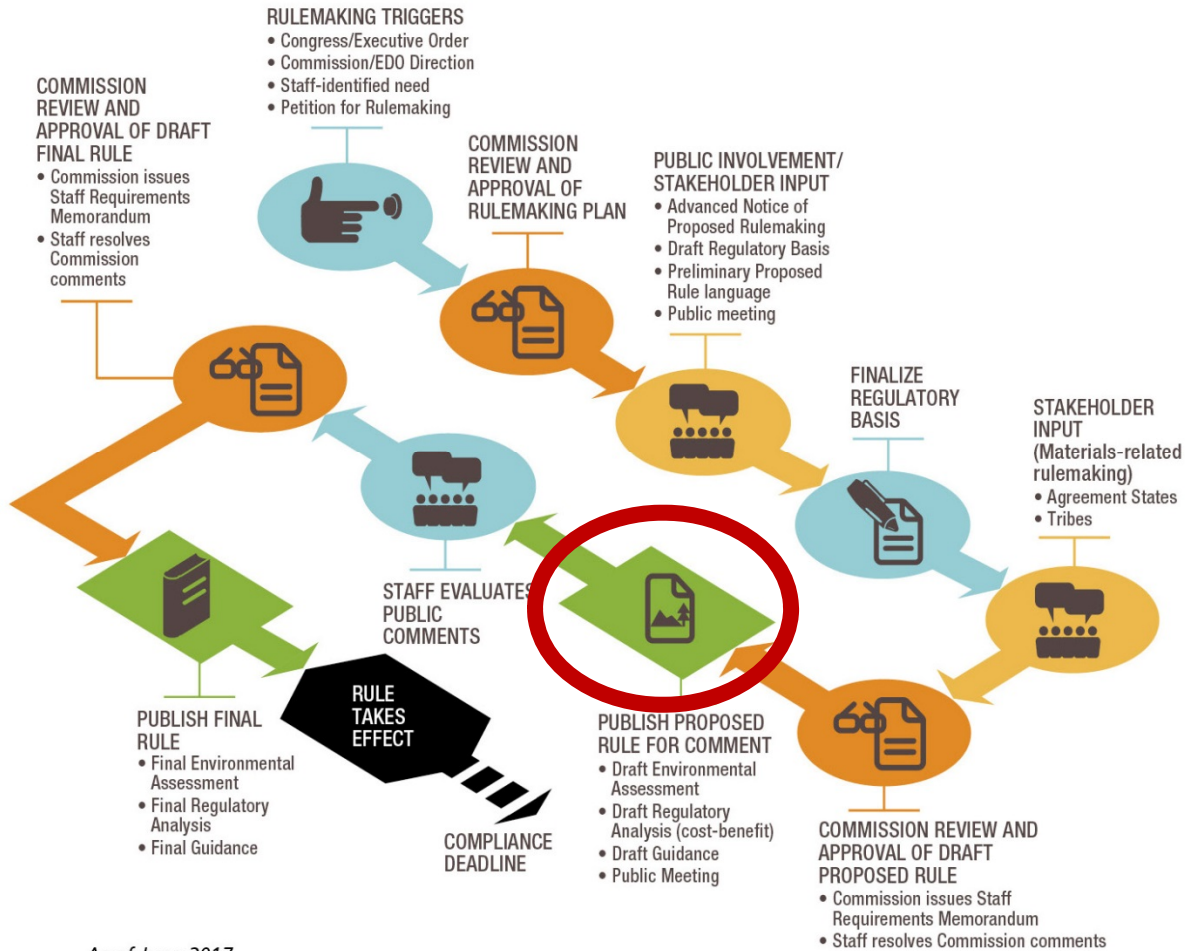
As of July 2017



Question 4: How can the tribal nations participate in the NRC's rulemaking process?

Answer: There are a few upcoming opportunities the public and the Tribal nations will have to participate and have their voice(s) heard by the NRC during the rulemaking activity. The process of developing these regulations is called "rulemaking." A regulation is sometimes referred to as a "rule."

A Typical Rulemaking Process



When a proposed rule is developed, it is published in the *Federal Register* for public comment. All rulemakings provide the public with at least one opportunity for comments. The notice provides information on where to send your comments and identifies an NRC contact who can reply to questions. The NRC may hold a public meeting and webinar during the proposed rule comment period to allow Tribes to ask questions about the proposed rule. The NRC will publish a notice of the location, time, and agenda of the meeting on <https://www.regulations.gov>, and on the NRC's public meeting Web site within at least 10 calendar days before the meeting. After the announced public comment period has ended, the NRC will consider comments received on the docket as it develops the final rule. The final rule, like the proposed rule, is published in the *Federal Register*. The documents related to this rulemaking can be found on the federal rulemaking Web site at <https://www.regulations.gov> by searching for Docket ID [NRC-2015-0225](https://www.regulations.gov).

The NRC plans to hold a variety of outreach activities, including a public meeting during the public comment period that will be open to all, including the Tribal nations. You may visit the NRC's public meeting Web site for information about any public meeting at <https://www.nrc.gov/pmns/mtg>. For more general information about the NRC, what we regulate, how we regulate, and our rulemaking process, please visit our Web site at <https://www.nrc.gov> or view our Information Digest NUREG-1350 (<https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1350/>).

The NRC issues press releases for rules that have strong public interest. In addition, the NRC tracks the status of its rules and petitions on its Web sites at <https://www.nrc.gov/about-nrc/regulatory/rulemaking/rules-petitions.html>.

In addition, the NRC publishes a Unified Agenda, which is a semiannual compilation of all rules on which the NRC has recently completed action, has proposed action, or is considering action. The Unified Agenda may be found on the NRC's rulemaking Web site at <https://www.nrc.gov/about-nrc/regulatory/rulemaking.html>.

Question 5: Why is the NRC developing new EP regulations in 10 CFR Part 50 and 10 CFR Part 52?

Answer: Under current regulations for large LWR designs, the size of the EPZs, which considers the U.S. Environmental Protection Agency's protective action guideline range of 10-50 millisievert (1-5 rem¹), is 10-miles (16-kilometers) for the plume exposure pathway EPZ and 50-miles (80-kilometers) for the ingestion exposure EPZ. However, for the small modular reactors (SMRs) and other new technologies (ONTs), the EPZ may be smaller and possibly extend only as far as the site boundary in some cases. Therefore, the NRC staff, consistent with the Commission's direction, has developed draft alternative EP requirements for SMRs and ONTs that will take into account: (1) the area in which planned, predetermined protective actions may be needed to protect the public from any potential radiation release (i.e., EPZ), and (2) the environmental conditions and the specific characteristics of radioactive materials that can potentially be released off site into the environment.

Question 6: What is the objective of this proposed rulemaking?

Answer: The objective for this rulemaking is to create alternative EP requirements that would: 1) continue to provide reasonable assurance that adequate protective measures can and would be implemented by an SMR or ONT licensee; 2) promote regulatory stability, predictability, and clarity; 3) reduce requests for exemptions from EP requirements; 4) recognize technological advancements embedded in design features; 5) credit safety enhancements in evolutionary and passive systems; and 6) credit smaller sized reactors' and non-light water reactors' (non-LWRs) potential benefits associated with postulated accidents, including slower event progression, and relatively small and slow release of fission products

Question 7: What does the regulatory basis document contain?

Answer: The NRC staff developed a regulatory basis that was issued in the *Federal Register* ([82 FR 52862](#)) on November 15, 2017, containing the justification for the rulemaking. The regulatory basis identified the regulatory problem, considered what regulatory options were available to solve the problem, identified the pros and cons for each option, and recommended a solution to that problem. The regulatory basis contains scientific, policy, legal, and technical information that support the staff's recommendation. It also contains a summary of stakeholder interactions during the development of the regulatory basis and limitations on the scope of the regulatory basis. The recommended solution is to amend the regulations, and the staff has developed this draft proposed rule, which will be issued for public comment, after Commission approval.

Question 8: What is the status and progress for the proposed rulemaking?

Answer: The NRC staff has developed a draft proposed rule, as well as draft implementing guidance (DG-1350), a draft regulatory analysis supporting the draft proposed rule, and an

¹ A Sievert is a unit of measure for radiation in SI units. A roentgen-equivalent man (rem) is also a special unit of measure of radiation but in English Units. 1 rem equals 10 millisieverts (mSv).

environmental assessment of radiological and non-radiological impacts to the environment. The NRC staff submitted the draft proposed rule to the Commission for its consideration and approval. The draft proposed rule package has been made publicly available (but not for comment at this point). If the Commission approves the draft proposed rule, then a notice will be sent to the Office of the Federal Register to be published in the *Federal Register* with a 75-day public comment period. The notice will identify an NRC contact who can reply to questions specific to the rulemaking, provide the timeframe for the public comment period, and provide information on where to send your comments.

The NRC plans to conduct a public meeting during the proposed rule comment period to allow stakeholders to ask clarifying questions about the proposed rule and draft guidance to inform their written comments. The NRC will publish a notice of the location, time, and agenda of the meeting on the NRC's public meeting Web site (<https://www.nrc.gov/pmns/mtg>) at least 10 calendar days before the meeting. Stakeholders (including Tribal nations) should monitor the NRC's public Web site. After the announced public comment period has ended, the NRC will consider comments received on the docket as it develops the final rule.

The documents related to this rulemaking can be found on the Federal rulemaking Web site: <https://www.regulations.gov> and search for Docket ID [NRC-2015-0225](https://www.regulations.gov).

Question 9: Will the new rule apply to existing power plants?

Answer: No. This proposed rule is not currently intended to apply to the existing large LWRs. Note that the entire existing fleet of operating commercial nuclear power plants, licensed by the NRC, are considered to be large light-water nuclear reactors. (See AQ #5 above)

The NRC initiated this rulemaking to seek a wide-range of public views and increase regulatory predictability and flexibility in the development of an alternative, generic approach that designers, vendors, and applicants may use to determine the appropriate EP requirements for SMRs and ONTs, for which emergency planning may otherwise be addressed on a case-by-case basis. In particular, this rulemaking would provide additional predictability and flexibility for advanced reactor developers that use simplified or other innovative means to accomplish their safety functions and provide enhanced margins of safety. Large LWRs were not included by the NRC in the scope of this proposed rule because an EP licensing framework already exists for those reactors, and licensees for those plants have not presented a clear interest in changing that framework. However, the Federal Register notice, under the "Specific Request for Comments," section, will include a question for public input as to whether the NRC should 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..

Question 10: What are ONTs?

Answer: Within this draft proposed rule, the NRC staff uses the term "ONTs" to refer to new technologies, such as non-LWRs and proposed medical radioisotope facilities that would be licensed under 10 CFR part 50. Further, within this proposed rule, the NRC uses the term "existing" or "current" when referring to existing licensees or applicants for an SMR or ONT facility. This proposed rule would also define "non-power production or utilization facility" to clarify the applicability of the proposed performance-based EP framework. As used in this proposed rule, the term "non-power production or utilization facility" would be defined to have the same meaning as the definition used in the NRC's proposed rule, "Non-Power Production or Utilization Facility License Renewal: Proposed Rule" (82 FR 15643; March 30, 2017)². The

² The NRC is currently addressing comments submitted on the March 30, 2017 proposed rule related to NPUF license renewal, which could impact the definition of "non-power production or utilization facility". Any changes made

definition would include non-power reactors and other production or utilization facilities licensed under § 50.21(a), § 50.21(c), or § 50.22 that are not nuclear power reactors or fuel reprocessing plants. In the context of this proposed rule, medical radioisotope facilities that would be licensed under 10 CFR part 50 would also be included within this definition of “non-power production or utilization facility”. The term “non-power production or utilization facility” is used in this rulemaking to distinguish between those medical radioisotope facilities that would be licensed as production or utilization facilities under 10 CFR part 50 and other facilities to be used for the production of medical radioisotopes that would be licensed under the regulations in 10 CFR parts 30, “Rules of General Applicability to Domestic Licensing of Byproduct Material,” 40, “Domestic Licensing of Source Material,” and 70, “Domestic Licensing of Special Nuclear Material.” Those facilities that would be licensed under 10 CFR parts 30, 40, or 70 would be covered by existing emergency planning requirements in these parts. Relevant 10 CFR part 70 fuel facility emergency planning considerations (e.g., inadvertent criticality accidents and hazardous chemical exposures) applicable to 10 CFR part 50 production facilities have been incorporated into this proposed rule and associated draft guidance. As such, the scope of this proposed rule is limited to these ONT facilities (i.e., non-LWRs and medical radioisotope facilities) for which the NRC expects to receive license applications under 10 CFR parts 50 or 52. Therefore, those NPUFs that are not considered ONTs (i.e., currently operating non-power reactors) are not within the scope of this rule. Currently operating non-power reactors will continue to implement existing emergency planning requirements and guidance.

Question 11: Will the new proposed EP regulations be applicable to the new advanced reactors (also known as non-LWRs)?

Answer: Yes. One of the NRC’s main considerations for developing this proposed rule is the potential consequences of accidents and applicability of accident source terms³ in the determination of the requirements for emergency planning, which includes direction on implementing protective actions in EPZs. The analyses that form the technical basis for the EPZ size for power reactors, as captured in the current EP regulations, assessed potential consequences of accidents using accident source terms for LWRs with a thermal power of around 3,000 MW. In the past, the NRC licensed several small-sized reactors ranging from 165 to 842 megawatts thermal (MWt) to a 5-mile plume exposure EPZ. This EPZ reduction, as compared to a 10-mile (16-kilometer) plume exposure EPZ for large LWRs, was based in part on the reactor’s smaller-sized reactor cores and associated smaller source terms.

Question 12: Why could multiple small reactors be treated differently in comparison to one large reactor?

Answer: The planning basis for EP includes consideration of several factors, such as the size of the potential source term included in any accidental release, the timing of the release, the mechanism for the release to the environment, and the mitigating factors that would influence the scope of the area where predetermined protective actions would be warranted. The draft proposed rule would enable the NRC to consider scenarios such as one SMR on a site as well as multiple SMRs on a site.

to the definition of “non-power production or utilization facility” based on the NRC’s disposition of these comments will be reflected in the final rule on EP for SMRs and ONTs.

³ *Source term* refers to the types and amounts of radioactive or hazardous material released to the environment following an accident.

Question 13: What is the role of the Federal Emergency Management Agency (FEMA) in this rulemaking?

Answer: The NRC continues to work with FEMA through the NRC-FEMA steering committee (as outlined in the NRC/FEMA Memorandum of Understanding under ADAMS Accession Number. [ML15344A371](#)) to ensure that our colleagues at FEMA understand the basis for the rulemaking. FEMA's role is associated with offsite preparedness and coordinating the overall Federal management of radiological issues via the Federal Radiological Preparedness Coordinating Committee (FRPCC). FEMA coordinates all Federal assistance and EP guidance to other Federal agencies and to State and local governments. The role of the FRPCC is to assist FEMA in developing policy direction for the provision of technical assistance to State and local governments in their radiological emergency planning and preparedness activities. In addition, FEMA continues to participate in the NRC's rulemaking process (e.g., FEMA submitted public comments on the regulatory basis document [ML17166A198](#)).

Question 14: Has there ever been an EPZ smaller than the current 10–50 miles (16-80 kilometers)?

Answer: Yes. The NRC approved a 5-mile (8-kilometer) plume exposure EPZ for each of the Big Rock Point (boiling-water reactor, 240 MWt), Fort St. Vrain (high-temperature, gas-cooled reactor, 842 MWt) and LaCrosse (boiling-water reactor, 165 MWt) reactors, which are all decommissioned. The NRC also has an existing EP framework with smaller EPZs for non-power reactors such as research and test reactors (RTRs). Because of the very low power level of RTRs, the small amount of radioactivity in the core, and the required safety features, the radiological risk to public health and safety from these facilities is expected to be small compared to large LWRs. Additionally, because non-power reactors are designed to operate with primary coolant temperatures and pressures close to ambient, the margins for safety are usually large; few, if any, credible accidents can be sufficiently damaging to release radioactive materials to unrestricted areas.