Draft Environmental Assessment for the Proposed Rule—Emergency Preparedness for Small Modular Reactors and Other New Technologies

U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety and Safeguards

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TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS

ADAMS	Agencywide Documents Access and Management System
CFR	*Code of Federal Regulations*
EA	environmental assessment
EP	emergency preparedness
EPA	U.S. Environmental Protection Agency
EPZ	emergency planning zone
FEMA	Federal Emergency Management Agency
FR	*Federal Register*
FRPCC	Federal Radiological Preparedness Coordinating Committee
IPZ	ingestion pathway emergency planning zone
LWR	light-water reactor
mSv	millisievert(s)
NEI	Nuclear Energy Institute
NHPA	National Historic Preservation Act of 1966, as amended
NPUF	non-power production or utilization facility
NRC	U.S. Nuclear Regulatory Commission
NUREG	an NRC technical report designation
ORO	offsite response organizations
ONT	other new technology
PAG	protective action guide
rem	roentgen equivalent man
RTR	research and test reactor
SMR	small modular reactor
SRM	staff requirements memorandum
TVA	Tennessee Valley Authority
U.S.C.	United States Code

1 INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) is proposing to amend its regulations to introduce a new alternative emergency preparedness (EP) regulatory framework for small modular reactors (SMRs) and other new technologies (ONTs). The proposed performance-based EP requirements would appear in a new section of the regulations, Title 10 of the *Code of Federal Regulations* (10 CFR) (Ref. 1) Section 50.160, "Emergency preparedness for small modular teactors, non-light water reactors, and non-power production or utilization facilities." Major provisions of the proposed rule and guidance would include the addition of: (1) a new alternative performance-based EP framework, including requirements for demonstrating effective response in drills and exercises for emergency and accident conditions, (2) a hazard analysis of any NRC-licensed or non-licensed facility contiguous or nearby to an SMR or ONT, that considers any hazard that would adversely impact the implementation of emergency plans, (3) a scalable approach for determining the size of the plume exposure pathway emergency planning zone (EPZ), and (4) a requirement to describe ingestion response planning in the emergency plan, including the capabilities and resources available to prevent contaminated food and water from entering the ingestion pathway.

The proposed rule and guidance could affect existing and future SMR and ONT facilities. For the purposes of this proposed rule, the term "small modular reactor" refers to a nuclear power reactor that has a licensed thermal power rating of less than or equal to 1,000 megawatts per module and that is licensed by the Commission under the authority of Section 103 or 104 of the Atomic Energy Act of 1954, as amended (AEA) (Ref. 2), and under the provisions of 10 CFR 50.21, "Class 104 licenses; for medical therapy and research and development facilities," or 10 CFR 50.22, "Class 103 Licenses; for Commercial and Industrial Facilities." In this proposed rule, the NRC is using the term "other new technologies" to refer to technologies, such as non-light water reactors (non-LWRs) and certain non-power production or utilization facilities (NPUFs) that would be licensed under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities." 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 SECY-19-0062, "Final Rule: Non-Power Production or Utilization Facility License Renewal" (Ref. 3). The definition of NPUF would include production or utilization facilities, licensed under 10 CFR 50.21(a), 10 CFR 50.21(c), or 10 CFR 50.22, as applicable, that are not nuclear power reactors or production facilities as defined under paragraphs (1) and (2) of the definition of *Production facility* in § 50.2. Proposed medical radioisotope facilities that would be licensed under 10 CFR Part 50 would also be included within this definition of NPUF.

The proposed alternative EP regulations would adopt a consequence-oriented, risk-informed, performance-based, and technology-inclusive approach, to the extent possible, to ensure reasonable assurance of adequate protection of public health and safety.

The NRC has prepared this environmental assessment (EA) in compliance with the agency's environmental protection requirements in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions" (Ref. 4), which implement the National Environmental Policy Act of 1969 (Ref. 5), as amended. This EA evaluates and documents the potential environmental impacts resulting from the proposed

rulemaking related to the amendment of its regulations to specify new alternative EP requirements for SMRs and ONTs.

1.1 Background

Under the NRC's current EP regulatory framework, applicants for a construction permit, early site permit, operating license, or combined license are required to provide emergency planning information as described under 10 CFR 50.33, "Contents of applications; general information," 10 CFR 50.34, "Contents of applications; technical information," 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants" (Ref. 6) Sections 52.17, "Contents of applications; technical information," or 10 CFR 52.79, "Contents of applications; technical information in final safety analysis report". Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50 establishes the specific items required for inclusion in emergency plans. Additionally, 10 CFR 50.47, "Emergency plans," provides EP requirements for nuclear power reactors, including planning standards for onsite and offsite emergency response plans. Other relevant regulations include 10 CFR 50.33 and 10 CFR 50.54(q), (s), and (t).

The EP requirements that apply to a particular licensee can vary depending on the type of license and facility. For example, in "10 CFR Parts 50 and 70, Emergency Planning; Final Rule," dated August 19, 1980 (Ref. 7), the NRC established emergency planning requirements in 10 CFR Part 50, Appendix E for research and test reactors (RTRs) that reflect the lower potential radiological hazards associated with these facilities. Although RTRs and other non-power production or utilization facilities (NPUFs) must meet the emergency planning requirements in 10 CFR 50.34(a)(10) and (b)(6)(v); 10 CFR 50.54(q); and 10 CFR Part 50, Appendix E, the requirements in 10 CFR 50.47 do not apply to these facilities. Additionally, in 10 CFR Part 50, Appendix E, Section I.3, the NRC differentiates between emergency planning requirements for nuclear power reactors, RTRs licensed under 10 CFR Part 50, and fuel facilities licensed under 10 CFR Part 70, stating that the size of EPZs and the degree to which compliance with 10 CFR Part 50, Appendix E, Section I, "Introduction," through Section IV, "Content of Emergency Plans," will be determined on a case-by-case basis for facilities other than power reactors.

The discussion of modernizing EP and developing voluntary performance-based requirements for light-water reactors (LWRs) merged with the NRC's discussions of advanced reactor designs. In the late 2000s, several advanced reactor designs in the U.S. were under discussion, including within the U.S. Department of Energy's Next Generation Nuclear Plant and SMR programs, and by private sector companies seeking to introduce an alternative to large LWRs. The NRC began to consider developing a performance-based approach to EP for SMRs and ONTs. In SECY-10-0034, "Potential Policy, Licensing, and Key Technical Issues for Small Modular Nuclear Reactor Designs," dated March 28, 2010 (Ref. 8), the NRC identified EP as a key technical issue for the licensing of SMRs and ONTs.

Because the NRC anticipates that SMR and ONT designs could differ substantially from the existing fleet of large LWRs and non-power reactors, certain existing EP requirements could impose a regulatory burden on SMR and ONT applicants and licensees that is not necessary to protect public health and safety. Historically, applicants have requested exemptions from EP regulations for small-sized reactors. As a result, the NRC anticipates that future SMR and ONT

applicants and licensees would do the same. Therefore, the NRC is conducting a rulemaking to develop an EP regulatory framework for SMRs and ONTs.

1.2 Proposed Action

The proposed action is a rulemaking that would add new alternative EP regulations and guidance specifically for existing and future SMR and ONT applicants and licensees to develop, submit, and maintain an emergency plan while ensuring the effective implementation of an emergency plan for these new nuclear technologies. In particular, this rulemaking would establish a regulatory framework for determining the size of the plume exposure pathway EPZ and not have a predetermined ingestion pathway EPZ (IPZ) for SMRs and ONTs.

1.3 Purpose of and Need for Proposed Action

Applicants for SMRs and ONTs currently must follow a regulatory framework and guidance for EP that is primarily focused on and was initially developed for large LWRs. The current EP requirements and guidance initially developed for large LWRs and non-power reactors do not consider the unique design and safety considerations associated with the operation of SMRs and ONTs. The objective for this rulemaking is to create a set of EP requirements that would: (1) continue to provide reasonable assurance that adequate protective measures can and will 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 advances in design and technological advancements embedded in design features, (5) credit safety enhancements in evolutionary and passive systems, and (6) credit smaller sized reactors and non-LWRs potential benefits associated with postulated accidents, including slower transient response times and relatively small and slow release of fission products.

In SECY-15-0077, “Options for Emergency Preparedness for Small Modular Reactors and Other New Technologies,” dated May 29, 2015 (Ref. 9), the NRC staff proposed a consequence-oriented approach to establishing EP requirements commensurate with the potential consequences to public health and safety and the common defense and security at SMR and ONT facilities. The NRC staff stated that the need for EP is based on the projected offsite dose in the unlikely occurrence of a severe accident. In Staff Requirements Memorandum (SRM)-SECY-15-0077, “Staff Requirements—SECY-15-0077—Options for Emergency Preparedness for Small Modular Reactors and Other New Technologies,” dated August 4, 2015 (Ref. 10), the Commission approved the staff’s recommendation to conduct rulemaking to address EP for SMRs and ONTs.

2 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

This EA evaluates the potential environmental impacts of developing a new alternative EP regulatory framework. The majority of the provisions in the proposed EP requirements are administrative or procedural in nature, such as definitions and general and technical information to be submitted as part of performance-based emergency plans (e.g., proposed requirements under 10 CFR 50.160(b)(1)), and would not have any significant environmental impacts. Further, the NRC has evaluated proposed requirements of interest to stakeholders, based on interactions described in Section 6 of this EA, that have the potential to affect the human environment, including the scalable approach for determining the size of the plume exposure pathway EPZ under proposed 10 CFR 50.33(g) and the ingestion response planning requirements under 10 CFR 50.160(b)(4), and determined that the proposed action would not have a significant environmental impact as discussed below.

The proposed rule includes alternative requirements for plume exposure pathway EPZ and ingestion response planning. Under proposed 10 CFR 50.33(g), the NRC would require SMR and ONT applicants and licensees choosing to comply with proposed 10 CFR 50.160 to submit the analysis used to establish the proposed plume exposure pathway EPZ size. Applicants would need to establish their EPZ as the area within which public dose, as defined in 10 CFR 20.1003, is projected to exceed 10 millisieverts (mSv) [1 roentgen-equivalent man (rem)] total effective dose equivalent (TEDE) over the first 96 hours from the release of radioactive materials resulting from a spectrum of credible accidents for the facility. Under proposed 10 CFR 50.160(b)(4), applicants and licensees choosing to comply with proposed 10 CFR 50.160 would need to describe or reference in the emergency plan capabilities that provide actions to protect contaminated food and water from entering into the ingestion pathway.

The planning basis for the existing EPZ requirements in 10 CFR Part 50 was established in NUREG-0396, “Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light-Water Nuclear Power Plants,” (Ref. 11) based on the objective that emergency response plans should provide dose savings for a spectrum of accidents that could produce offsite doses in excess of the U.S. Environmental Protection Agency (EPA) early-phase Protective Action Guides (PAGs). In EPA-400/R-17/001, “PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents,” (Ref. 12), EPA provides recommended numerical PAGs for the principal protective actions available to public officials during a radiological accident, including guidance for early phase protective actions for projected doses ranging from 10 to 50 mSv (1 to 5 rems) during the first 96 hours of an accident.

In this proposed rule, the NRC would establish a plume exposure pathway EPZ boundary that provides public protection from dose levels above a 10 mSv (1 rem) TEDE threshold. The primary purpose of the plume exposure pathway EPZ is to provide an area where predetermined protective actions are implemented, which result in dose savings and a reduction in early health effects. In determining this boundary, the applicant would consider plume exposure doses from a spectrum of credible accidents for the facility. The proposed rule would apply the same dose standard for predetermined protective actions to SMRs or ONTs as is required of the current operating large LWRs. By maintaining this consistency, the regulations described in proposed 10 CFR 50.33(g)(2) would afford the same level of protection of the

public health and safety as the current regulatory framework. Because the dose criteria under which predetermined protective actions would be taken (e.g., evacuation, sheltering) would be similar under both rules, the dose consequence to the public would be similar and therefore human health impacts would be similar.

Under the existing EP regulations, SMRs and ONTs, depending on their capacity and technology, are either required to establish a 50-mile IPZ, in addition to a 10-mile plume exposure pathway EPZ, or follow the case-by-case EPZ size determination process under 10 CFR 50.33(g), 50.47(c)(2), and section I.3. of Appendix E to 10 CFR Part 50. For SMR and ONT applicants and licensees choosing to comply with 10 CFR 50.160, this proposed rule does not provide for a specific ingestion pathway planning zone. The NRC is proposing ingestion response planning requirements instead of a set distance as part of the performance-based framework. Ingestion response planning focuses planning efforts on identification of major onsite and offsite exposure pathways for ingestion of contaminated food and water. The rule would require those applicants and licensees who opt to comply with 10 CFR 50.160 to describe in their emergency plan the licensee, Federal, Tribal, State, and local resources for emergency response capabilities available to sample, assess, and implement a quarantine or embargo of food and water to protect against contaminated food and water from entering the ingestion pathway.

The concept of an IPZ was created in the 1970s when there may not have been sufficient infrastructure to support the identification and removal from food chains of radiologically contaminated goods. Of primary concern in the 1970s were the livestock and food products that could be contaminated from a radiological release at a large LWR. Since the 1970s, there have been significant improvements in the nation's Federal and State capabilities to identify and remove from the food chain biologically and radiologically contaminated goods or produce. Current Federal resources developed since then that are available for radiological emergency response include the Federal Radiological Monitoring and Assessment Center (FRMAC) and the Advisory Team for Environment, Food and Health, as well as sampling and testing laboratories.

Ingestion response is not required in the early phase of an emergency, because ingestion of contaminated foods and water is a longer term concern. The Federal and state resources that have been developed since the 1970s are available for the intermediate and late phases of the response, whether or not actions are pre-planned in a specific area. Therefore, SMRs, non LWRs, and NPUFs that choose to comply with 10 CFR 50.160 do not need an IPZ because there are additional resources available and a better understanding of the process and timing for identifying and removing radiologically contaminated goods from food chains. Nonetheless, Federal, Tribal, State, and local response organizations can issue precautionary actions to the public, such as to wash all produce from gardens or to use stored feed for livestock for those areas in the downwind direction of a release. Tribal, State, and local response organizations do not need completed analyses to make a precautionary recommendation to interdict food or put livestock on stored feed. States and Federal agencies frequently issue such precautionary actions for non-radiological contamination of foods. None of these precautionary actions require an IPZ.

While the proposed alternative EP framework would not require SMRs to establish an IPZ, the capabilities available to identify and interdict contaminated food and water in the event of a radiological emergency would not differ from those required under existing EP regulations.

Therefore, the ingestion response planning requirements under proposed 10 CFR 50.160(b)(4) would not have any significant environmental impacts.

Further, the proposed EPZ size determination requirements in 10 CFR 50.33(g) and ingestion response planning requirements in 10 CFR 50.160(b)(4) would not: (1) affect nonradiological plant effluents in a way different from those under existing EP regulations, (2) involve construction or major renovation of any buildings or structures, ground disturbing activities, or alterations to land or air quality, (3) affect any historic and cultural resources, or (4) have any other environmental impact. This is because the proposed action provides an alternative EP framework, which could address preparedness and response for emergencies at facilities, but would not impact the construction or operation of facilities.

Based on the above evaluation, the NRC concludes that the proposed alternative EP requirements for SMRs and ONTs would not have a significant impact on the environment.

3 ENVIRONMENTAL IMPACTS OF THE ALTERNATIVE TO THE PROPOSED ACTION

Under the no-action alternative (i.e., the status quo), the regulations would not change. As stated in Section 2 of this EA, the proposed rule would not result in a significant impact on the environment. Therefore, there would be no difference in environmental impacts between the no-action alternative and the proposed rule. The only difference would be in the costs attributable to reviewing the environmental impacts of exemption and license amendment requests under the no-action alternative. An applicant or licensee for an SMR or ONT would have to comply with the existing regulations or request an exemption from the regulations. The NRC would analyze the environmental impacts of exemptions and license amendment requests on a case-by-case basis. Therefore, the averted costs (benefits) of the rulemaking would not occur. Refer to the "Regulatory Analysis for the Proposed Rule: Emergency Preparedness for Small Modular Reactors and Other New Technologies" (Ref. 13) for information about the costs and benefits of the no-action alternative and the proposed action.

4 AGENCIES AND PERSONS CONSULTED

The NRC developed the proposed rule and this draft EA. The NRC is requesting public comment on this draft EA. The NRC intends to hold a public meeting during the proposed rule comment period to allow stakeholders to ask questions about the proposed rule and this EA. The NRC will consider comments received on the docket as it develops the final rule and the final EA. The NRC will issue the final EA when it publishes the final rule.

During the development of this proposed rule, the NRC conducted many public meetings and other interactions with stakeholders on issues related to the SMR and ONT EP rulemaking. Table 1 in Section 6 of this document lists these interactions.

The NRC staff met with the Federal Radiological Preparedness Coordinating Committee (FRPCC) to discuss the issues raised in SECY-11-0152, "Development of an Emergency Planning and Preparedness Framework for Small Modular Reactors," dated October 28, 2011 (Ref. 14), on SMR EP and the sizes of the EPZs. The FRPCC is composed from 20 Federal departments, agencies, and offices that work together to assure that the U.S. is safe from radiological incidents, involving nuclear or radioactive materials, including acts of terrorism. The NRC staff also met separately in 2014 with the U.S. Federal Emergency Management Agency (FEMA) technical hazards and radiological EP staff and EPA staff to discuss preliminary SMR design concepts and potential impacts on both onsite and offsite EP. The staff provided FEMA with a copy of SECY-11-0152 and the opportunity to interact with the staff, obtain clarification, and comment on the paper. FEMA indicated that it would like the NRC to keep it informed on issues raised in SECY-11-0152 and that it supports the staff's recommendation to explore the issues involving SMR EP through rulemaking.

The NRC published the draft regulatory basis in March 2017 (Ref. 15) and sought public comment on specific questions and issues with respect to possible revisions to the agency's requirements. In addition, the NRC held a public meeting in May 2017 (Ref. 16) and received 57 comment submissions that it considered in its preparation of the final regulatory basis, which contained 223 individual comments related to EP. The NRC considered all public comments during the development of the regulatory basis. The NRC did not receive comments related to the preliminary environmental analysis in the draft regulatory basis. Based on the comments received, the NRC finalized and published the regulatory basis in Volume 82 of the *Federal Register*, page 52862 (82 FR 52862) in November 2017 (Ref. 17).

Consistent with the Tribal Policy Statement of principles to guide the agency's Government-to-Government interactions with American Indian and Alaska Native Tribes (Ref. 18), the NRC conducted outreach to the Tribes. On August 2, 2018, the NRC discussed the NRC's rulemaking process and the EP for SMRs and ONTs rulemaking effort with the Tribal nations at the Bureau of Indian Affairs' Emergency Management meeting.

As discussed in Section 2.0 above, the majority of the proposed rule provisions are administrative in nature, and the proposed EPZ requirements under 10 CFR 50.33(g) and 10 CFR 50.160(b)(4) would not have a significant impact on the human environment. For this reason, the rulemaking would not result in impacts to listed species or critical habitat, and the NRC has determined that Section 7 consultation under the Endangered Species Act of 1973 (Ref 19), as amended, is not necessary.

Congress enacted the National Historic Preservation Act of 1966 (Ref. 20), as amended (NHPA), to support and encourage the preservation of prehistoric and historic resources. Section 106 of the NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties and allow the Advisory Council on Historic Preservation an opportunity to review and comment on the undertaking. The NHPA implementing regulations are in 36 CFR Part 800, “Protection of Historic Properties” (Ref. 21).

The proposed EPZ requirements under 10 CFR 50.33(g) and the ingestion response planning requirement under 10 CFR 50.160(b)(4) do not involve any ground disturbing activities or visual impacts that could effect historic properties. Therefore, the NRC has determined that no consultation is required under Section 106 of the National Historic Preservation Act of 1966, as amended.

5 FINDING OF NO SIGNIFICANT IMPACT

The NRC has prepared this EA to determine environmental impacts of the proposed action (i.e., a rulemaking to update the NRC's regulations related to EP requirements for SMRs and ONTs). The majority of the provisions in the proposed EP requirements are administrative or procedural in nature, such as definitions and general and technical information to be submitted as part of performance-based emergency plans (e.g., proposed requirements under 10 CFR 50.160(b)(1)), and would not have any significant environmental impacts. Further, the NRC has evaluated proposed requirements that may be of interest to stakeholders and that have the potential to affect the human environment, including the scalable approach for determining the size of the plume exposure pathway EPZ under proposed 10 CFR 50.33(g) and the ingestion response planning requirements under 10 CFR 50.160(b)(4), and determined that the proposed action would not have a significant environmental impact for the following reasons. Under the existing EP requirements and the proposed alternative EP requirements, the dose criteria under which predetermined protective actions would be taken (e.g., evacuation, sheltering) would be similar under both rules, and therefore, the dose consequence to the public would be similar. The proposed ingestion response planning requirements under proposed 10 CFR 50.160(b)(4), while not requiring SMR and ONT applicants and licensees to establish an IPZ, would provide the same capabilities available to identify and interdict contaminated food and water in the event of a radiological emergency as required under existing EP regulations. The environmental effects of the proposed ingestion response planning requirements are similar to that of the existing EP requirements. Based on this EA, the NRC concludes that the proposed EPZ requirement under 10 CFR 50.33(g) and ingestion response planning requirement under 10 CFR 50.160(b)(4) would not have a significant impact on the human environment. Therefore, this rulemaking does not warrant preparation of an environmental impact statement. Accordingly, the NRC has determined that a finding of no significant impact is appropriate.

6 STAKEHOLDER INTERACTIONS

Table 1 lists the interactions between the NRC and stakeholders during public meetings on issues related to the SMR and ONT EP rulemaking.

Table 1 NRC and Stakeholder Interactions

Date	Action
July 28, 2010	The NRC held a public meeting to discuss the regulatory issues with the agency related to key licensing issues concerning SMRs, such as EP. Location: Legacy Hotel, Rockville, MD 20852.
December 15, 2011	The NRC held a Category 2 meeting to discuss the generic licensing and policy issues related to SMRs, including EP, with industry working groups (coordinated by the Nuclear Energy Institute (NEI)) and other stakeholders. Location: U.S. Nuclear Regulatory Commission, Commissioner's Hearing Room, Rockville, MD 20852.
December 13, 2012	The NRC held a public meeting with NEI to discuss the industry's proposed approach for integral pressurized-water reactors on source term analysis and emergency planning evaluation in advance of NEI's planned submittal of position papers on those topics. The purpose of the meeting was to continue dialogue between the NRC and NEI on the two planned papers. Location: U.S. Nuclear Regulatory Commission, Commissioner's Hearing Room, Rockville, MD 20852.
April 17, 2013	The NRC held a public meeting with NEI to discuss its December 27, 2012, submittal of a position paper on small SMR source terms (Agencywide Document Access and Management System (ADAMS) Accession No. ML13004A390). The purpose of the meeting was to facilitate discussions between the NRC and NEI about the content of the paper. Location: U.S. Nuclear Regulatory Commission, Commissioner's Hearing Room, Rockville, MD 20852.
April 8, 2014	The NRC held a Category 2 public meeting to discuss an NEI-proposed methodology on the sizes of SMR EPZs. Location: U.S. Nuclear Regulatory Commission, Commissioner's Hearing Room, Rockville, MD 20852.
September 9, 2014	The NRC met with the Federal Radiological Preparedness Coordinating Committee to discuss the issues raised in SECY-11-0152, "Development of an Emergency Planning and Preparedness Framework for Small Modular Reactors," dated October 28, 2011, on SMR EP and the sizes of the EPZs. The NRC staff also met separately in 2014 with the U.S. Federal Emergency Management Agency (FEMA) technical hazards and radiological EP staff and EPA staff to discuss preliminary SMR design concepts and

Date	Action
	potential impacts on both onsite and offsite EP. The staff provided FEMA with a copy of SECY-11-0152 and the opportunity to interact with the staff, obtain clarification, and comment on the paper. FEMA indicated that it would like the NRC to keep it informed on issues raised in SECY-11-0152 and that it supports the staff's recommendation to explore the issues involving SMR EP through rulemaking. Location: U.S. Nuclear Regulatory Commission, Commissioner's Hearing Room, Rockville, MD 20852.
December 17, 2014	The NRC held a meeting with NEI and the Tennessee Valley Authority (TVA) to discuss a proposed generic framework for SMR EP being developed by NEI. In that meeting, TVA also described its plan to use that framework in the Clinch River Nuclear Site early site permit application to propose two specific plume exposure EPZ options: (1) 2 miles and (2) site boundary. TVA stated that a subsequent combined license submittal will incorporate one of the two options when a specific SMR design is selected. Location: U.S. Nuclear Regulatory Commission, Two White Flint North Auditorium, Rockville, MD 20852.
July 21, 2016	The NRC presented preliminary EP for SMR and ONT rulemaking information at the Organization of Agreement States and Conference of Radiation Control Program Directors meeting. Location: Hyatt Regency Lexington Hotel, Lexington, KY 40507.
August 22, 2016	The NRC held a Category 3 public meeting to request feedback from the public and interested stakeholders on the potential approach (performance-based) that the NRC may follow in developing the rulemaking for SMR and ONT EP. The agenda, the NRC staff's presentation, and the meeting summary are available under ADAMS Accession Nos. ML16223A812, ML16232A263, and ML16257A510. Location: U.S. Nuclear Regulatory Commission, Three White Flint North, Conference Room 1-C-3, North Bethesda, MD 20852.
April 11, 2017	The NRC discussed the preliminary draft regulatory basis document at the National Radiological Emergency Preparedness meeting. Location: Amway Grand Plaza Hotel, Grand Rapids, MI 49503.
April 13, 2017	The NRC published a *Federal Register* notice to issue a draft regulatory basis document (ADAMS Accession No. ML16309A332) in support of the potential amendment of current regulations on SMR and ONT EP.
April 18, 2017	The NRC published a press release to notify the public about the availability of the draft regulatory basis document for public comment.

Date	Action
April 20, 2017	The NRC issued STC-17-040, "Notice of Draft Regulatory Basis for Comment: Rulemaking for Emergency Preparedness for Small Modular Reactors and Other New Technologies," dated April 20, 2017, to notify the States about the availability of the draft regulatory basis document for public comment.
May 10, 2017	The NRC held a Category 3 public meeting to discuss the draft regulatory basis for the SMR and ONT EP rulemaking. The agenda, the staff's presentation, and the meeting summary are available under ADAMS Accession Nos. ML17101A609, ML17125A036, and ML17139C860. Location: U.S. Nuclear Regulatory Commission, Two White Flint North Auditorium, Rockville, MD 20852.
October 16, 2017	The NRC made the regulatory basis publicly available under ADAMS Accession No. ML17206A265.
November 15, 2017	The NRC published a *Federal Register* notice to issue the regulatory basis document in support of the SMR and ONT EP rulemaking.
August 2, 2018	The NRC discussed (via teleconference) the NRC's rulemaking process and the EP for SMRs and ONTs rulemaking effort with the Tribal nations at the Bureau of Indian Affairs' Emergency Management meeting.
August 22, 2018	The NRC staff briefed the Advisory Committee on Reactor Safeguards Joint Subcommittee on the proposed rule and draft guidance for SMR and ONT EP.
October 4, 2018	The NRC staff briefed the Advisory Committee on Reactor Safeguards on the proposed rule and draft guidance for SMR and ONT EP.
2020	The NRC will hold a Category 3 public meeting to discuss the proposed rule for SMR and ONT EP. The agenda, the staff's presentation, and the meeting summary will be available in ADAMS.

7 REFERENCES

1. *Code of Federal Regulations* (CFR), "Domestic Licensing of Production and Utilization Facilities," Part 50, Chapter 1, Title 10, "Energy."
2. Atomic Energy Act of 1954, as amended (42 U.S.C 2011 et seq.).
3. U.S. Nuclear Regulatory Commission (NRC), SECY-19-0062, "Final Rule: Non-Power Production or Utilization Facility License Renewal," June 17, 2019, ADAMS Accession No. ML18031A000.
4. CFR, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." Part 51, Chapter 1, Title 10, "Energy."
5. National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.).
6. CFR, "Licenses, Certifications, and Approvals for Nuclear Power Plants." Part 52, Chapter 1, Title 10, "Energy."
7. NRC, "Emergency Planning," Final Rule, 45 FR 55402, August 19, 1980.
8. NRC, SECY-10-0034, "Potential Policy, Licensing, and Key Technical Issues for Small Modular Nuclear Reactor Designs," March 28, 2010, ADAMS Accession No. ML093290268.
9. NRC, SECY-15-0077, "Options for Emergency Preparedness for Small Modular Reactors and Other New Technologies," May 29, 2015, ADAMS Accession No. ML15037A176.
10. NRC, Staff Requirements Memorandum (SRM)-SECY-15-0077, "Options for Emergency Preparedness for Small Modular Reactors and Other New Technologies," August 4, 2015 ADAMS Accession No. ML15216A492.
11. NRC and the U.S. Environmental Protection Agency (EPA) Task Force on Emergency Planning, NUREG-0396 (EPA 520/1-78-016), "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light-Water Nuclear Power Plants," December 1978.
12. EPA-400/R-17/001, "PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents," January 2017.
13. NRC, "Regulatory Analysis for the Proposed Rule: Emergency Preparedness for Small Modular Reactors and Other New Technologies," ML1813A077.
14. NRC, SECY-11-0152, "Development of an Emergency Planning and Preparedness Framework for Small Modular Reactors," October 28, 2011, ADAMS Accession No. ML112570439.
15. NRC, "Rulemaking for Emergency Preparedness for Small Modular Reactors and Other New Technologies," Draft Regulatory Basis, 82 FR 17768, April 2017.
16. NRC, "U.S. Nuclear Regulatory Commission Public Meeting Summary," May 24, 2017, ADAMS Accession No. ML17139C860.
17. NRC, "Rulemaking for Emergency Preparedness for Small Modular Reactors and Other New Technologies," Regulatory Basis Document, 82 FR 52862, November 2017.
18. NRC, "Tribal Policy Statement," 82 FR 2402, January 9, 2017.
19. Endangered Species Act of 1973, as amended (16 U.S.C .1531 et seq.).
20. National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.).
21. CFR, "Protection of Historic Properties." Part 800, Chapter 8, Title 36, "Parks, Forests, and Public Property."