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This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

NUCLEAR REGULATORY COMMISSION

10 CFR Part 50

[Docket No. PRM-50-123; NRC-2020-0155]

Public Protective Actions During a General Emergency

AGENCY: Nuclear Regulatory Commission.

ACTION: Petition for rulemaking; consideration in the rulemaking process.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) will consider in its rulemaking process issues raised in a petition for rulemaking (PRM), PRM-50-123, submitted by Thomas McKenna. The petitioner requested that the NRC amend its regulations to ensure protective actions in the event of a general emergency will likely do more good than harm.

DATES: The docket for the petition for rulemaking, PRM-50-123, is closed on July 21, 2025.

ADDRESSES: Please refer to Docket ID NRC-2020-0155 when contacting the NRC about the availability of information for this action. You may obtain publicly available information related to this action by any of the following methods:

- *Federal Rulemaking Website:* Go to <https://www.regulations.gov> and search for Docket ID NRC-2020-0155. Address questions about NRC dockets to Helen Chang; telephone: 301-415-3228; email: Helen.Chang@nrc.gov.

- *NRC's Agencywide Documents Access and Management System (ADAMS):* You may obtain publicly available documents online in the ADAMS Public Documents collection at <https://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "Begin Web-based ADAMS Search." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, at 301-415-4737, or by email to PDR.Resource@nrc.gov. For the

convenience of the reader, instructions about obtaining materials referenced in this document are provided in the "Availability of Documents" section.

- *NRC's PDR:* The PDR, where you may examine and order copies of publicly available documents, is open by appointment. To make an appointment to visit the PDR, please send an email to PDR.Resource@nrc.gov or call 1-800-397-4209 or 301-415-4737, between 8 a.m. and 4 p.m. eastern time, Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT:

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I. The Petition

The NRC received and docketed a petition for rulemaking dated June 1, 2020, filed by Thomas McKenna. On August 31, 2020, the NRC published a notice of docketing and request for public comment on the petition (85 FR 53690). The petitioner requested that the NRC amend its regulations in part 50 to title 10 of the *Code of Federal Regulations* (10 CFR), "Domestic Licensing of Production and Utilization Facilities," and that the NRC work with the U.S. Federal Emergency Management Agency (FEMA) to revise associated implementation guidance, supporting analysis, and materials and activities to ensure that protective actions in the event of a general emergency will likely do more good than harm considering the health hazards of both radiation exposure and protective actions.

A. Background

The Atomic Energy Act of 1954, as amended, authorizes the Commission to establish, by rule, minimum criteria for the issuance of licenses for utilization

facilities in a manner that protects the health and safety of the public. The Commission's emergency planning regulations are an important part of the regulatory framework for protecting public health and safety. Before it can issue an operating license or combined license for a nuclear power plant, the NRC is required by paragraph (a) of 10 CFR 50.47, "Emergency plans," to make a finding that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. The NRC bases its finding on its review of a license applicant's emergency plan. A licensee's emergency plan is considered adequate if it complies with the NRC's regulations, specifically, the 16 planning standards of § 50.47(b) and the content of emergency plan requirements in appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to part 50. The objective of the Commission's emergency planning regulations is to provide dose savings for a spectrum of radiological incidents that have the potential to produce offsite doses in excess of Federal protective action guides.

A general emergency is an emergency classification level indicating that events at a nuclear power plant are in progress or have occurred that involve either actual or imminent substantial core degradation or melting with potential for loss of containment integrity, or hostile action that results in an actual loss of physical control of the facility. During a general emergency, offsite releases can be reasonably expected to exceed exposure levels in the U.S. Environmental Protection Agency (EPA) Protective Action Guides (PAG) Manual EPA-400/R-17/001, "PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents" (PAG Manual). Onsite and offsite emergency plans provide for public protective actions in response to a general emergency under § 50.47(b)(10). This regulation requires, in part, a range of protective actions for the plume exposure pathway emergency planning zone¹ for emergency workers

¹ A "plume exposure pathway emergency planning zone" is a geographic area, approximately 10 miles in radius, including and surrounding a commercial nuclear power plant, within which the health and safety of the general public could be adversely affected by radiological exposure from an emergency at the plant. This emergency planning

and the public. In developing this range of actions, consideration must be given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide, as appropriate. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, must be developed and in place.

In an emergency, a nuclear power reactor licensee would recommend protective actions to the offsite decision-maker (e.g., the Governor, Incident Commander), who would make any protective action decisions. The current NRC guidance for developing protective action strategies is contained in Supplement 3, "Guidance for Protective Action Strategies," to NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants." This guidance provides an NRC-accepted method for implementing a range of protective actions for the plume exposure pathway emergency planning zone and is intended for use by nuclear power reactor licensees to develop site-specific protective action recommendation (PAR) procedures. Offsite response organizations also should use Supplement 3 to develop protective action strategy guidance for decision-makers.

The recommended dose criteria and their associated bases for protective actions for radiological incidents are in the PAG Manual. PAGs are the projected dose to an individual at which a specific protective action to reduce or avoid that dose is recommended. The PAG Manual provides PAGs to help decision-makers select appropriate protective actions under emergency conditions. As the EPA states in the PAG Manual, the decision to advise members of the public to take a protective action during a radiological emergency must be weighed against the action's inherent risks. The EPA established the PAGs by balancing the acceptable level of risk of health effects from radiation exposure in an emergency situation against the costs and risks associated with the protective action. The EPA considered the following principles in establishing exposure levels for the PAGs: (1) prevent acute effects, (2) reduce risk of chronic effects, and (3) balance protection with other important factors and ensure that actions result in more benefit than harm.

zone defines the area where predetermined, prompt protective measures may be necessary during an emergency at the plant that results in an offsite release.

B. Issues Raised in the Petition

The NRC identified four issues in the petition as follows:

Issue 1: NRC requirements and guidance on protective action strategies are outdated and do not reflect the results of the latest studies of nuclear power plant emergencies.

The petitioner requested that the NRC promptly conduct studies to better quantify the current understanding of health risks of protective actions and associated dislocations, which refers to people moving to and residing in a different location as a result of protective actions. In addition, the petitioner stated that the revisions to regulations and guidance need to be based on a probabilistic risk assessment of protective action strategies considering (1) updated estimates of important early and late radiation-induced health effects, (2) the detrimental health effects of protective actions and resulting dislocations, and (3) possible public response. The petitioner also requested that the revisions consider the application of the EPA PAGs, which the petitioner stated are an integral part of the NRC's protective action guidance. The petitioner requested that analyses should not be based on conservative assumptions that could distort the results.

Issue 2: The NRC does not provide tools to allow decision-makers and the public to balance the radiation health hazards versus the health hazards of the protective actions. Additionally, the petitioner requested that the NRC and stakeholders develop guidance for the public and public officials that would facilitate them making risk-informed decisions during planning and response, by balancing the hazards of radiation exposure, protective actions, and resulting dislocations.

Issue 3: NRC regulations and guidance do not state that protective actions should do more good than harm. The petitioner claimed that rulemaking may be the only effective approach to ensure that the term "adequate protective measures" in § 50.47 is interpreted to mean taking protective measures that will likely do more good than harm considering the health hazards of both radiation exposure and protective actions.

Issue 4: Dislocations resulting from taking protective actions consistent with NRC guidance upon declaration of a general emergency may cause more deaths among the public and elderly than deaths caused by radiation exposure due to the general emergency.

II. Public Comments on the Petition

A. Overview of Public Comments

On August 31, 2020, the NRC requested comments from interested persons on the petition. The comment period ended on November 16, 2020. The NRC received 14 public comments from 5 different entities. Two entities (Nuclear Energy Institute (NEI) and a private citizen) generally supported the petition, and two entities (Nuclear Energy Oversight Project (NEOP) and Beyond Nuclear) generally opposed the petition. One entity provided one comment that was outside the scope of the petition and did not express support or opposition.

B. NRC Response to Public Comments

The NRC binned the comments related to the petition into three categories. The following discussion provides a summary of each comment and the NRC's response to the comment.

1. Comments Supporting the Petition

Comment: The NRC received a comment stating that current guidance directs power reactor licensees to transmit protective action recommendations to offsite response organizations within 15 minutes of a general emergency declaration. The offsite response organizations then have 15 minutes to determine protective actions for the public. Protective action strategies should be revised to meet these time-based goals or the goals should be changed if additional decision-making time would aid in making better risk-informed decisions for protection of the public.

NRC Response: The NRC agrees, in part, with this comment. The NRC's regulations require prompt notification to the public and for licensees to have the capability to notify responsible State and local governmental agencies within 15 minutes after declaring an emergency. Under current guidance, licensees should issue protective action recommendations with the notification of a general emergency. The capability to decide upon appropriate protective action recommendations is typically included in these 15 minutes but is not a regulatory requirement. The 15-minute notification requirement is based on postulated accident scenarios in Appendices V and VI to NUREG-75/014, "Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants" (WASH-1400), from 1975, and assumes that the time from initiation of the event to the start of atmospheric release could be as short as 30 minutes. However, more recent State-of-the-Art Reactor

Consequence Analyses (SOARCA) studies and advanced reactor designs likely would not support continued use of the assumption of a release within 30 minutes, but instead indicate that more than 30 minutes would be available before the start of a release. The PAR process could be enhanced by considering the timing of the PAR decision and the timeliness of emergency declarations and notifications in relation to accident characteristics, specifically the accident timing, specific to the facility type. The NRC will consider this issue in its rulemaking process.

Comment: The NRC received a comment stating that the development of new protective action strategies and decision-making aids requires extensive stakeholder input and reviews that should include licensees, offsite response organizations, the Conference of Radiation Control Program Directors, and FEMA.

NRC Response: The NRC agrees with this comment. The NRC would provide opportunities for stakeholder input on new protective action strategies, whether as a revision to current guidance or as part of rulemaking. These opportunities would include public meetings and requests for public comment noticed in the **Federal Register**. In addition, the NRC regularly participates in radiological emergency preparedness (EP) conferences and meetings to keep key stakeholders, such as the Conference of Radiation Control Program Directors, aware of current EP activities. The NRC routinely consults with FEMA on radiological EP under the July 1, 2024, memorandum of understanding between the two agencies.

Comment: The NRC received a comment stating that requirements for implementation of new protective action strategies should allow time for budgeting, completion of procedure and dose projection software changes, and training by both licensees and offsite response organizations.

NRC Response: The NRC agrees with this comment. Whether through the rulemaking or guidance development process, the NRC will seek stakeholder input regarding the cumulative effects of regulation, including the timing and expected resource needs related to the implementation of new protective action strategies.

Comment: The NRC received a comment stating that the NRC should consider improvements to both the regulations and guidance that govern the consequence-based EP frameworks for the various types of facilities licensed by the NRC.

NRC Response: The NRC agrees with this comment. The NRC applies a graded approach to emergency preparedness in which the emergency planning requirements and criteria for a facility are commensurate with the relative radiological risk and potential hazards of the facility, among other considerations. This approach is risk-informed and consequence-oriented. Examples of how the NRC applies this regulatory framework can be found in the exemptions granted to the licensees of the Three Mile Island Nuclear Station, Pilgrim Nuclear Power Station, and Oyster Creek Nuclear Generating Station to reduce or eliminate EP requirements that were no longer necessary due to the decommissioning status of those facilities. The NRC also proposed this regulatory framework in the “Regulatory Improvements for Production and Utilization Facilities Transitioning to Decommissioning” proposed rule published in the **Federal Register** on March 3, 2022 (87 FR 12254).

Comment: The NRC received a comment stating that the Commission should consider the insights identified in the petition. For example, the petitioner noted that, in incident response dose assessment, protective actions should never be recommended based on worst case conservative dose assessments. The comment stated that the petitioner showed the harm that can occur from basing PARs on worst case dose assessments. Also, the EPA PAGs are set at levels well below those that would cause harm from radiological exposure. As a result, basing PARs on more realistic dose projections could also result in the harm described by the petitioner.

NRC Response: The NRC agrees, in part, with the comment. The NRC will consider the insights identified in the petition in the rulemaking. The NRC disagrees that more realistic dose projections could result in the harm described by the petitioner. Section 1.4.5 of the EPA PAG Manual discusses the level of conservatism built into the PAGs. The EPA encourages radiological assessors to use realistic inputs and to avoid overly conservative dose estimates that may lead to unnecessary protective actions. As such, realistic dose projections are more likely to reduce unnecessary protective actions and the risk of harm from those actions.

2. Comments Opposing the Petition

Comment: The NRC received a comment stating that evacuation planning and preparedness should be expanded, not diminished. The outcome of the petitioner’s request would be to

significantly diminish the nuclear industry’s liability for the precipitating accident and what can be extremely prolonged, complicated dislocation and recovery costs. Nuclear disasters should require that industry liability bear more, not less, responsibility to its victims.

NRC Response: The NRC disagrees with this comment. The NRC examined the EP planning basis in response to a petition for rulemaking requesting the NRC to expand emergency planning zones in light of the Chernobyl Nuclear Power Station and Fukushima Dai-ichi Nuclear Power Plant accidents (79 FR 19501; April 9, 2014). The NRC denied the petition and concluded that the basis for the current size of emergency planning zones is valid for existing reactors and that reasonable assurance exists that protective measures can and will be taken in the event of a radiological emergency at an existing nuclear power plant. Similar petitions for rulemaking to expand emergency planning were also denied on the grounds that an insufficient basis existed to amend the EP regulations (55 FR 5603; February 16, 1990).

A rulemaking to address this petition would not change the industry’s liability in the event of an accident at a nuclear power plant. The Price-Anderson Act (PAA) is a Federal statute enacted in 1957 to cover liability claims of members of the public for personal injury and property damage caused by a commercial nuclear power plant accident. The PAA limits the total amount of liability each nuclear power plant licensee faces in the event of an incident. If damages from the incident exceed this limit, then under the PAA, Congress will “thoroughly review the particular incident and will take whatever action is determined necessary and appropriate to protect the public from the consequences of a disaster of such magnitude.” Furthermore, there are other Federal authorities and funding mechanisms that could be used to respond to a nuclear/radiological incident depending on the circumstances. These include the Comprehensive Environmental Response, Compensation, and Liability Act and the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

Comment: The NRC received a comment stating that the NRC’s SOARCA program needs serious adjustment before using it to assess deaths from nuclear emergencies. The comment stated that, at the time SOARCA was released, there were concerns about the assumptions used for design failures of Mark I reactors, severe accident probabilities, availability of resources to mitigate

accidents, and the use of risk coefficients based on older studies.

NRC Response: The NRC disagrees with the comment. The NRC conducted the SOARCA project to develop best estimates of the offsite radiological health consequences for potential severe reactor accidents. While SOARCA had limitations (for example, not including spent fuel pool accidents and releases), it represents some of the most detailed reactor analyses ever completed at that time. Those analyses still serve as reasonable representations for how a severe reactor accident could progress and the magnitude of radiological consequences as a result of a release if operators and mitigation equipment are unable to prevent a release.

The initial SOARCA deterministic analyses of postulated accidents at the Peach Bottom Atomic Power Station and Surry Power Station indicated that all modeled accident scenarios progress more slowly and release smaller amounts of radioactive material than calculated in earlier studies, even if operators are unsuccessful in stopping the accident. The NRC followed the initial SOARCA studies with more detailed uncertainty analyses for a boiling water reactor with a Mark I containment (NUREG/CR-7155, "State-of-the-Art Reactor Consequence Analyses Project: Uncertainty Analysis of the Unmitigated Long-Term Station Blackout of the Peach Bottom Atomic Power Station"), a pressurized water reactor with a large dry containment ("State-of-the-Art Reactor Consequence Analyses Project: Uncertainty Analysis of the Unmitigated Short-Term Station Blackout of the Surry Power Station, Draft Report"), and a pressurized water reactor with an ice condenser containment (NUREG/CR-7245, "State-of-the-Art Reactor Consequence Analyses (SOARCA) Project: Sequoyah Integrated Deterministic and Uncertainty Analysis"). The three uncertainty analyses were summarized in "State-of-the-Art Reactor Consequence Analyses Project: Uncertainty Analyses for Station Blackout Scenarios." The uncertainty analyses corroborated the conclusions from the earlier SOARCA studies. The SOARCA studies were extensively peer-reviewed, and the NRC addressed public comments on the modeling approach and assumptions as described in Appendices B and C of NUREG-1935, "State-of-the-Art Reactor Consequence Analyses (SOARCA) Report."

Although these studies model protective actions and demonstrate that protective actions are effective for avoiding or reducing dose, the SOARCA studies were not used to assess the

relative efficacy of various protective action strategies. Additionally, the health risk models and risk coefficients from exposure to ionizing radiation, including mortality, are established through epidemiological studies and recommendations by scientific bodies such as the International Commission on Radiological Protection, the United Nations Scientific Committee on the Effects of Atomic Radiation, the National Council on Radiation Protection and Measurements, and the U.S. National Academy of Sciences (NAS) Biological Effects of Ionizing Radiation (BEIR). Specifically, the technical basis for the health risk parameters used in the SOARCA studies were based on the BEIR V risk models; see the NAS report titled, "Health Effects of Exposure to Low Levels of Ionizing Radiation: BEIR V," 1990. An NRC rulemaking to address this petition may benefit from SOARCA insights but would be supported by additional technical analyses specific to the issues raised in this petition for rulemaking.

Comment: The NRC received a comment stating that a serious meltdown with release of radiation and widespread contamination has occurred every 7 years on average, in contrast to the petitioner's assumption that severe consequences are improbable.

NRC Response: The NRC disagrees with the comment. Following the Fukushima Dai-ichi reactor accident, the NRC developed NUREG-2201, "Probabilistic Risk Assessment and Regulatory Decisionmaking: Some Frequently Asked Questions," to address complaints that probabilistic risk assessment-based estimates of the likelihood of major accidents were significantly smaller than simple statistical estimates based on international events (notably the accidents at Three Mile Island, Chernobyl, and Fukushima). Plant risk is heavily dependent on plant-specific details, and major safety improvements have been made to nuclear power plants in the United States over time in response to hypothetical and actual accidents. As such, statistical estimates of accident rates based solely on past accident data are not a valid indicator of future events. Nuclear power plant accidents are rare events, and the NRC has applied lessons learned following these accidents aimed at preventing future such occurrences. Even so, emergency preparedness is based on a spectrum of accidents, including those with a very low likelihood of occurring. The EP planning basis ensures regulatory requirements for emergency plans are effective regardless of the accident probability.

Comment: The NRC received a comment stating that thyroid cancer is the most recognized health impact from nuclear meltdowns, and thyroid cancer and other thyroid diseases need to be assessed in the context of this petition. Consideration of shelter-in-place replacing evacuation should focus on the protection of and disproportionate impacts of radiation on women, children, and fetuses. There are too many limitations and uncertainties to recommend risky shelter-in-place, instead of evacuation, in the event of a general emergency at nuclear facilities.

NRC Response: The NRC agrees, in part, with the comment. Although thyroid cancer is a risk associated with radiation exposure and some populations are more radiosensitive than others, any given accident will have its own set of circumstances to be considered in making decisions for public protective actions. The experience of actual reactor accidents has highlighted the need to consider a holistic view of public health and emphasized the importance of a risk-informed approach to protective action decision-making based on a balanced assessment of the risks. A focus on the stochastic risks (*i.e.*, the risk of cancer and genetic effects from exposure to ionizing radiation) at the expense of ignoring the cost and health risk of the protective action itself is contrary to the principles for the PAGs established by the EPA. A rulemaking would provide an opportunity to examine ways to reduce the uncertainties on implementation strategies for protective actions by making use of the known benefits and limitations of evacuation and shelter-in-place.

Comment: The NRC received a comment stating that the petitioner's argument aims to reduce public protection from the harmful effects of radiation exposure and diminish "defense-in-depth," the longstanding philosophical foundation of nuclear power oversight.

NRC Response: The NRC disagrees with the comment. Emergency preparedness exists as an independent layer of defense-in-depth. Emergency planning provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. Enhancing protective action strategies would not alter the role emergency planning plays in defense-in-depth. These enhanced strategies would support the goal of defense in depth, which is to ensure that the public is protected from harm, as stated in NUREG/KM-0009, "Historical Review and Observations of Defense-in-Depth."

Comment: The NRC received a comment stating that any proposed rule related to a general emergency declaration at a commercial nuclear power plant should be considered in light of a “worst case” scenario. A worst-case scenario involves a loss of coolant accident in which the nuclear reactor core melts down through the bottom of the nuclear reactor vessel and containment building. The comment refers to the Fukushima Dai-ichi and Chernobyl nuclear power plant events as support for the use of a worst-case scenario.

NRC Response: The NRC agrees, in part, with the comment. The NRC’s EP planning basis considers the need for emergency planning in light of severe accidents, including the comment-provided scenario of a core melt-through and subsequent atmospheric release of radioactive materials. However, as described 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,” a combined NRC and EPA task force determined that radiological emergency planning should be based on a full spectrum of accidents and corresponding consequences tempered by probability considerations. This standard for developing emergency plans, which uses the consequences of various events and the likelihood of those consequences occurring, is known as a risk-informed, consequence-oriented approach. The risk-informed planning basis for EP established in NUREG–0396 was endorsed for use in the Commission’s policy statement, “Planning Basis for Emergency Responses to Nuclear Power Reactor Accidents,” dated October 23, 1979 (44 FR 61123). A rulemaking to address this petition should follow a risk-informed, consequence-oriented approach. This approach would allow an applicant or licensee to develop protective action strategies appropriate for its facility type.

Comment: The NRC received a comment stating that during a general emergency declaration involving a worst-case loss of coolant accident, in which the nuclear reactor core melts down through the bottom of the reactor vessel and containment building, there currently does not exist any NRC rule or regulation that would protect the health and safety of the public or protect the environment. To the extent that government officials would recommend shelter-in-place or evacuation, that advice would result in tens of thousands of deaths.

NRC Response: The NRC disagrees with the comment. NRC regulations exist to protect the health and safety of the public and protect the environment. For example, in the event of a loss of coolant accident, emergency core cooling systems, which are required by § 50.46, “Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors,” would provide core cooling and prevent a significant core melt accident and large release of radioactive materials. In addition, as part of this regulatory framework, the EP regulations in § 50.47 provide reasonable assurance that adequate protective measures can and will be taken in the unlikely event that a significant radiological release were to occur.

Specific to radiological emergencies, the EPA provides guidance to decision-makers to recommend evacuation or shelter-in-place for the general public when whole body doses are projected to exceed established PAGs. In addition, protective actions such as evacuation and shelter-in-place are not unique to radiological events and are commonplace actions in response to a variety of hazards such as chemical spills, fires, and natural disasters. FEMA’s Comprehensive Preparedness Guide (CPG) 101 is the foundation for State, territorial, Tribal, and local emergency planning in the United States. The CPG 101 states that while the causes of emergencies can vary greatly, many of their effects do not. As such, planners can address common operational functions, including conducting evacuations and shelter operations, which are effective even though each emergency’s characteristics are different. Specific guidance for the use of evacuation and shelter-in-place is part of comprehensive emergency planning as described in the FEMA guidance on “Planning Considerations: Evacuation and Shelter-in-Place.”

The NRC has performed extensive studies, described in NUREG/CR–6864, Volume 1, “Identification and Analysis of Factors Affecting Emergency Evacuations,” and NUREG/CR–6981, “Assessment of Emergency Response Planning and Implementation for Large Scale Evacuations,” and found that evacuations, whether pre-planned or ad hoc, safely removed people from the affected area, saved lives, and reduced the potential number of injuries from the hazard. However, these studies did not examine the physical health impacts of prolonged displacements of populations as a result of evacuation or relocation to ensure that protective actions are properly balanced against the radiological risk. The NRC study in

NUREG/CR–7285, “Nonradiological Health Consequences from Evacuation and Relocation,” published in September 2021, examines the relative risk of experiencing negative health effects among populations displaced as a result of various emergency events. The results of this analysis are available to decision-makers to help assess the risk of evacuation as compared to the risk of sheltering-in-place and could be used as part of a technical basis for rulemaking.

3. Other Public Comments

Comment: The NRC received a comment stating that consideration should be given to potential revisions aimed at providing better alignment of the Design Basis Accident (DBA) dose criteria specified in regulation with the EPA PAGs. Currently this differential is substantial. The PAGs are set below the dose levels that would cause harm from radiation exposure, and protective actions based on these PAGs could result in harm from unnecessary evacuations. The design basis accident dose criteria should be better aligned with the PAGs. Consideration should be given to using 10 rem for the PAGs and for design basis accident dose criteria.

NRC Response: This comment is outside the scope of the petition because design basis accident dose criteria are not part of EP regulations. In addition, the EPA, not the NRC, has the authority to develop and revise the PAGs.

III. Reasons for Consideration

The NRC will consider all four issues raised in the PRM within its rulemaking process. The NRC will evaluate within its rulemaking process the current requirements and guidance for protective actions implemented during a general emergency at nuclear power plants to assess whether and how to incorporate risk insights considering the health hazards of both radiation exposure and protective actions. The remaining paragraphs of Section III summarize the NRC’s evaluation of the four assertions identified in the petition.

Evaluation of Petition Issues (Petitioner Assertions)

Issue 1: NRC requirements and guidance on protective action strategies are outdated and do not reflect the latest studies of nuclear power plant emergencies.

The petitioner stated that the fundamental problem with NRC requirements and guidance on protective action strategies is that they are based on analysis that is, in some cases, more than 40 years old and did not consider either (1) the health impact

of protective actions and resulting dislocations or (2) the latest analysis of nuclear power plant emergencies, which project much smaller releases and thus smaller radiation-induced health consequences. The petitioner asserted that the NRC requirements and guidance were not established on a truly risk-informed basis. Additionally, the petitioner observed that the latest NRC analysis of radiation-induced health consequences of general emergencies did not include (1) the consideration of all important early radiation-induced health effects (e.g., to the embryo/fetus), (2) probabilistic risk assessment of radiation-induced health effects for various protective action strategies as done in earlier studies, and (3) consideration of the health impact of protective actions.

NRC Evaluation: The petitioner's assertion that the latest NRC analysis of radiation-induced health consequences of general emergencies does not reflect the latest studies was made in reference to the insights available in the NRC's SOARCA studies. The SOARCA studies showed that mitigation efforts can effectively stop or slow an accident; some accidents take much longer to happen and release much less radioactive material than earlier analyses suggested; and the analyzed accidents would cause essentially zero immediate deaths and only a very small increase in the risk of long-term cancer deaths. Although the SOARCA studies did not assess all potential early radiation-induced health effects or assess the benefit of various protective action strategies, SOARCA did include a sensitivity analysis on the timing of protective actions and the health risks for various population cohorts including the general public, schools, and special facilities such as hospitals and nursing homes.

While SOARCA provides many useful insights, the SOARCA studies were performed after the EP rulemaking that established the current regulations and guidance ("Enhancements to Emergency Preparedness Regulations" (76 FR 72560; November 23, 2011)) and, thus, did not form the basis for current NRC regulations and guidance for protective action strategies. The current guidelines for the choice of protective actions are consistent with the PAG Manual, and early radiation-induced health effects were considered in establishing the PAGs. The guidance for protective action strategies is also risk-informed. In the mid-2000s, the NRC used the latest technical information available at the time to examine various protective action strategies as documented in Volumes 1–3 of NUREG/CR–6953,

"Review of NUREG–0654, Supplement 3, 'Criteria for Protective Action Recommendations for Severe Accidents.'" This study served as the basis for revisions to NUREG–0654, Revision 1, Supplement 3, published in 2011. The 2011 NRC guidance on protective action strategies places more emphasis on staged evacuation and sheltering-in-place as an alternative to radial evacuation when staged evacuation and sheltering-in-place are more protective. This guidance also provided ways to risk-inform implementing protective actions under various conditions including rapidly progressing events; impediments to evacuation such as adverse weather, earthquake impacts, or hostile action against the nuclear facility; and changes in wind direction or plant conditions.

The NRC partially agrees with the petitioner's assertions that the NRC's requirements and guidance on protective action strategies could be updated to reflect the latest studies of nuclear power plant emergencies and will evaluate this issue in its rulemaking process. The NRC does not agree that NRC guidance would result in excess evacuations or relocations, leading to excess deaths among the public, especially in the elderly. NRC guidance on protective action strategies is consistent with the principles established in the PAG Manual for early phase PAGs and is intended to reduce or avoid dose in the event of a general emergency. Licensees are responsible for terminating the general emergency declaration, but offsite response organizations are responsible for terminating protective actions for the public, the duration of which will vary depending on the severity of the event. Considering the risk of the protective actions alone, the effectiveness of evacuations was examined by the NRC as documented in NUREG/CR–6864, Volume 1, and the planning efforts important to implementing effective large-scale evacuations were assessed in the study published in NUREG/CR–6981, "Assessment of Emergency Response Planning and Implementation for Large Scale Emergencies." However, the NRC agrees that there are physical health effects of prolonged evacuation and relocation that should be considered in protective action decision-making and that these physical health effects are not explicitly considered in current guidance. Therefore, the NRC is considering the issues raised by the petitioner in a rulemaking process that will assess the physical health effects of prolonged evacuation and relocation.

Issue 2: The NRC does not provide tools to allow decision-makers and the public to balance the radiation health hazards versus the health hazards of the protective actions.

The petitioner asserted that to allow for risk-informed decisions, guidance is needed on balancing the health hazards of radiation exposure versus the health hazards of protective actions during planning and response.

NRC Evaluation: The NRC agrees, in part, with the assertion. The NRC guidance for protective action strategies in Supplement 3 to NUREG–0654, Revision 1, provides a development tool and is intended for use by nuclear power reactor licensees to develop site-specific protective action recommendation procedures. Offsite response organizations should use the tool to develop protective action strategy guidance for decision-makers. The development tool is risk-informed and based on a study of the efficacy of alternative protective action strategies in reducing consequences to the public from a spectrum of nuclear power plant core melt accidents, as described in Volumes 1–3 of NUREG/CR–6953. However, the tool is not optimized to balance radiation health hazards against the health hazards of the protective actions. The NRC will evaluate changes to guidance during either the rulemaking process or as part of a separate prior action, as appropriate.

Issue 3: NRC regulations and guidance do not state that protective actions should do more good than harm.

The petitioner observed that NRC regulations and guidance state that the overall objective of radiological emergency planning is to provide dose savings for a spectrum of accidents that could produce offsite doses in excess of the current Federal PAGs. However, no mention is made that protective actions should do more good than harm.

NRC Evaluation: The NRC agrees, in part, with the assertion. NRC EP regulations do not state that protective actions should do more good than harm, and NRC EP guidance documents do state dose savings as a primary objective of EP. However, EP regulations in § 50.47(b)(10) state that guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, must be developed and in place. The PAG Manual does include the principle to balance protection with other important factors and ensure that actions result in more benefit than harm. However, as part of the rulemaking process, the NRC will consider potential amendments to its regulations to explicitly state that

protective actions should do more good than harm.

Issue 4: Dislocations resulting from taking protective actions consistent with NRC guidance upon declaration of a general emergency may cause more deaths among the public, especially in the elderly, than caused by radiation exposure due to the general emergency.

The petitioner estimated that dislocations resulting from protective actions triggered by declaration of a general emergency, under NRC guidance, may cause 12 times more deaths among the public and specifically 15 times more deaths among elderly residents of care facilities than caused by radiation exposure during a representative general emergency. The petitioner also estimated that dislocations resulting from protective actions triggered by dose projections during a general emergency where the EPA PAGs are projected to be exceeded, as called for by NRC guidance, may cause 24 to 600 times more deaths among the public and 30 to 750 times more deaths among the elderly residents

of care facilities than the radiation-induced deaths prevented by the relocation. The petitioner also asserted that—

[S]ome States may be using dose criteria lower than EPA PAGs (NRC 2013a) making them potentially more hazardous. These disparities could be even greater when protective actions are taken based on imprecise or conservative dose projections thus resulting in less dose saving than the PAG (footnotes omitted).

NRC Evaluation: The NRC agrees, in part, with the assertion. As documented in NUREG/CR-6864, Volume 1, the NRC studied the efficiency and effectiveness of public evacuations in response to emergency events and found that evacuations saved lives and reduced the potential number of injuries from the hazard. In addition, NRC regulations in § 50.47(b)(13) require general plans for recovery and reentry to be developed, including the framework for relaxing protective actions and allowing for return as described in NUREG-0654/FEMA-REP-1, Revision 2, “Criteria for Preparation and Evaluation of

Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” published December 2019. Although the magnitude of deaths caused by dislocations resulting from protective actions triggered by declaration of a general emergency is difficult to precisely estimate, the NRC studied the nonradiological health impacts of evacuations and relocations, and as reported in NUREG/CR-7285, the study supports the general assertion that prolonged dislocation results in (1) excess mortality among susceptible population groups and (2) other physical health consequences in the general population. The study also supports the petitioner’s assertion in that prolonged dislocations may cause more deaths among the public, especially in the elderly, than caused by radiation exposure.

IV. Availability of Documents

The documents identified in the following table are available to interested persons through one or more of the following methods, as indicated.

Document	Adams accession No./web link/ Federal Register citation
Petition for Rulemaking (PRM-50-123), “Public Protective Actions During a General Emergency,” June 1, 2020.	ML20176A313.
PRM-50-123, Petition for Rulemaking, Notice of Docketing and Request for Comment, “Public Protective Actions During a General Emergency,” August 31, 2020.	85 FR 53690.
Comment (001) of David Young on Behalf of the Nuclear Energy Institute, October 15, 2020	ML20289A632.
Comment (002) of Thomas Saporito on Behalf of Nuclear Energy Oversight Project, Inc., October 25, 2020.	ML20301A614.
Comment (003) of Cindy Folkers on Behalf of Beyond Nuclear, November 16, 2020	ML20321A255.
Comment (004) of Anonymous, November 14, 2020	ML21056A497.
Comment (005) of John Parillo, November 16, 2020	ML21056A495.
NUREG-0654/FEMA-REP-1, Revision 1, Supplement 3, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants: Guidance for Protective Action Strategies,” November 2011.	ML113010596.
NUREG-0654/FEMA-REP-1, Revision 2, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” December 2019.	https://www.fema.gov/sites/default/files/2020-08/fema_NUREG-0654-REP1-rev2_12-2019.pdf .
EPA-400/R-17/001, “PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents,” January 2017.	https://www.epa.gov/sites/default/files/2017-01/documents/epa_pag_manual_final_revisions_01-11-2017_cover_disclaimer_8.pdf .
NUREG-75/014, “Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants,” (WASH-1400), Appendices V and VI, October 1975.	ML070530533 (App. V) ML070600389 (App. VI).
Memorandum of Understanding Between the Department of Homeland Security/Federal Emergency Management Agency and Nuclear Regulatory Commission Regarding Radiological Emergency Response Planning and Preparedness, July 1, 2024.	ML24184A043.
Three Mile Island Nuclear Station, Units 1 and 2—Exemptions from Certain Emergency Planning Requirements and Related Safety Evaluation (EPID L-2019-LLE-0016), December 1, 2020.	ML20244A292.
Pilgrim Nuclear Power Station—Exemptions from Certain Emergency Planning Requirements and Related Safety Evaluation (EPID L-2018-LLE-0011), December 18, 2019.	ML19142A043.
Oyster Creek Nuclear Generating Station—Exemptions from Certain Emergency Planning Requirements and Related Safety Evaluation (CAC NO. MG0153; EPID L-2017-LLE-0020), October 16, 2018.	ML18220A980.
Proposed Rule, “Regulatory Improvements for Production and Utilization Facilities Transitioning to Decommissioning,” March 3, 2022.	87 FR 12254.
Denial of Petition for Rulemaking (PRM-50-104), “Emergency Planning Zones,” April 9, 2014	79 FR 19501.
Denial of Petitions for Rulemaking (PRM-50-31, PRM-50-45, and PRM-50-46), “Emergency Preparedness at Nuclear Power Plants,” February 16, 1990.	55 FR 5603.
Price-Anderson Act, 1957	42 U.S.C. 2210, Public Law 85-256.
Comprehensive Environmental Response, Compensation, and Liability Act, 1980	42 U.S.C. 9601.
Robert T. Stafford Disaster Relief and Emergency Assistance Act, 1988	42 U.S.C. 5121 et seq., Public Law 93-288.
Disaster Relief Act, 1974 (as amended)	42 U.S.C. 5121 et seq., Public Law 100-707.

Document	Adams accession No./web link/ Federal Register citation
NUREG/CR-7155, "State-of-the-Art Reactor Consequence Analyses Project: Uncertainty Analysis of the Unmitigated Long-Term Station Blackout of the Peach Bottom Atomic Power Station," May 2016.	ML16133A461.
"State-of-the-Art Reactor Consequence Analyses Project: Uncertainty Analysis of the Unmitigated Short-Term Station Blackout of the Surry Power Station," Draft Report for Comment, August 2015.	ML15224A001.
NUREG/CR-7245, "State-of-the-Art Reactor Consequence Analyses (SOARCA) Project: Sequoyah Integrated Deterministic and Uncertainty Analysis," October 2019.	ML19296B786.
Conference Paper, 9th European Review Meeting on Severe Accident Research (ERMSAR 2019), "State-of-the-Art Reactor Consequence Analyses Project: Uncertainty Analyses for Station Blackout Scenarios," March 2019.	https://www.tandfonline.com/doi/full/10.1080/00295450.2021.1875737 .
NUREG-1935, "State-of-the-Art Reactor Consequence Analyses (SOARCA) Report," November 2012.	ML12332A053 (Package).
National Academy of Sciences, "Health Effects of Exposure to Low Levels of Ionizing Radiation: BEIR V," 1990.	https://www.nap.edu/catalog/1224/health-effects-of-exposure-to-low-levels-of-ionizing-radiation .
NUREG-2201, "Probabilistic Risk Assessment and Regulatory Decisionmaking: Some Frequently Asked Questions," September 2016.	ML16245A032.
NUREG/KM-0009, "Historical Review and Observations of Defense-in-Depth," April 2016	ML16104A071.
NUREG-0396, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," December 1978.	ML051390356.
NRC Policy Statement, "Planning Basis for Emergency Responses to Nuclear Power Reactor Accidents," October 23, 1979.	44 FR 61123.
FEMA Comprehensive Preparedness Guides (CPG) 101, Version 3.0, "Developing and Maintaining Emergency Operations Plans," September 2021.	https://www.fema.gov/emergency-managers/national-preparedness/plan .
FEMA Guidance, "Planning Considerations: Evacuation and Shelter-in-Place Guidance: State, Local, Tribal, and Territorial Partners," July 2019.	https://www.fema.gov/sites/default/files/2020-07/planning-considerations-evacuation-and-shelter-in-place.pdf .
NUREG/CR-6864, Vol. 1, "Identification and Analysis of Factors Affecting Emergency Evacuations: Main Report," January 2005.	ML050250245.
NUREG/CR-6981, "Assessment of Emergency Response Planning and Implementation for Large Scale Evacuations," October 2008.	ML082960499.
NUREG/CR-7285, "Nonradiological Health Consequences from Evacuation and Relocation," September 2021.	ML21252A104.
Final Rule, "Enhancements to Emergency Preparedness Regulations," November 23, 2011	76 FR 72560.
NUREG/CR-6953, Vol. 1, "Review of NUREG-0654, Supplement 3, 'Criteria for Protective Action Recommendations for Severe Accidents,'" December 2007.	ML080360602.
NUREG/CR-6953, Vol. 2, "Review of NUREG-0654, Supplement 3, 'Criteria for Protective Action Recommendations for Severe Accidents': Focus Groups and Telephone Survey," October 2008.	ML083110406.
NUREG/CR-6953, Vol. 3, "Review of NUREG-0654, Supplement 3, 'Criteria for Protective Action Recommendations for Severe Accidents': Technical Basis for Protective Action Strategies," August 2010.	ML102380087.

V. Conclusion

For the reasons cited in this document, the NRC will consider the four issues raised in the petition in its rulemaking process and as part of the development of related guidance. The NRC will evaluate the current requirements and guidance for protective actions implemented during a general emergency at nuclear power plants, assess whether changes are needed to consider risk insights into the health hazards of both radiation exposure and protective actions, and if changes are needed, determine the proper regulatory action.

The NRC tracks the status of all rules and PRMs on its website at <https://www.nrc.gov/about-nrc/regulatory/rulemaking/rules-petitions.html>. The public may monitor the docket for the rulemaking on the Federal rulemaking website, <https://www.regulations.gov>, by

searching on NRC-2025-0412. In addition, the Federal rulemaking website allows members of the public to receive alerts when changes or additions occur in a docket folder. To subscribe: (1) navigate to the docket folder (NRC-2020-0155); (2) click the "Subscribe" link; and (3) enter an email address and click on the "Subscribe" link. Publication of this document in the **Federal Register** closes Docket ID NRC-2020-0155 for PRM-50-123.

Dated: July 17, 2025.

For the Nuclear Regulatory Commission.

Carrie Safford,

Secretary of the Commission.

[FR Doc. 2025-13606 Filed 7-18-25; 8:45 am]

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DEPARTMENT OF DEFENSE

Office of the Secretary

32 CFR Part 310

[Docket ID: DoD-2025-OS-0177]

RIN 0790-AL67

Privacy Act of 1974; Implementation

AGENCY: Office of the Secretary of Defense (OSD), Department of Defense (DoD).

ACTION: Proposed rule.

SUMMARY: The Department of Defense (Department or DoD) is giving concurrent notice of a new Department-wide system of records pursuant to the Privacy Act of 1974 for the DoD-0025, "Counterintelligence Investigations and Collection Activities (CICA)" system of records and this proposed rulemaking.