AFFIRMATION ITEM

RESPONSE SHEET

TO: Brooke P. Clark, Secretary

FROM: Commissioner Baran

SUBJECT: SECY-22-0001: Rulemaking: Final Rule: Emergency Preparedness for Small Modular Reactors and Other New Technologies

Approved X **Disapproved** X **Abstain** ____ **Not Participating** ____

COMMENTS: **Below** ____ **Attached** X **None** ____

Entered in STARS
Yes X
No ____

Jeffery M. Baran
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Date: 2023.04.18 16:59:49 -04'00'

Signature

4/18/23

Date

Commissioner Baran's Comments on SECY-22-0001, "Final Rule: Emergency Preparedness for Small Modular Reactors and Other New Technologies"

Establishing a regulatory framework for small modular reactors (SMRs) and advanced reactors will enable the agency to perform effective and efficient licensing reviews and oversight, while providing regulatory certainty for potential applicants and vendors. Emergency preparedness is an important part of this framework.

Because SMRs and non-light-water reactors have the potential to be safer than traditional, large light-water reactors, there is broad agreement that a graded approach to emergency preparedness makes sense. Almost all stakeholders agree that this final rule should recognize the potential safety benefits of lower radionuclide inventories and the smaller and slower release of fission products in accident scenarios. In their comments on the proposed rule, NRC's emergency preparedness partners at FEMA and state response agencies expressed comfort with a SMR emergency planning zone (EPZ) smaller than 10 miles that would be scalable based on the design characteristics of a particular SMR.

However, site boundary EPZs raise a unique set of concerns. Although NRC has previously licensed research and test reactors with site boundary EPZs and a few small reactors with a 5-mile EPZ, it has never licensed a commercial nuclear power plant with an EPZ that ended at the site boundary.[1] Unlike a 5-mile or even 2-mile EPZ, a site boundary EPZ would not require dedicated offsite radiological emergency planning, and FEMA would have no role in evaluating the adequacy of a site's emergency plans. With a site boundary EPZ, emergency responders would be left with all-hazards planning. While the NRC staff believes that all-hazards planning would be sufficient, FEMA and state emergency response agencies are not convinced.

In its comment on the proposed rule, FEMA states that it does not believe that all-hazards planning would be adequate in the event of an actual nuclear power plant accident. According to FEMA, the "*ad hoc* approach" of responding to an emergency without the radiological emergency pre-planning offered by an off-site EPZ "does not assure that the full range of necessary actions will be taken, and it makes it much more likely that any response will be uncoordinated."[2] FEMA explains that "the belief expressed by the NRC that state and local governments surrounding a site boundary EPZ at an SMR, which have not previously been involved in radiological emergency planning, would nonetheless respond effectively to an actual emergency in a coordinated fashion using its [all hazards plan] is open to serious question."[3] Because "a site boundary EPZ effectively eliminates the need for full participation exercises to test and validate state and local governments capacity," "the preparedness of the state and local governments is not demonstrated in any meaningful sense."[4]

Similarly, New Jersey emphasizes the importance of "a defense-in-depth approach for low probability, high consequence events" and contends that an "all hazards framework for emergency planning and response does not adequately address the unique nature of a radiological incident."[5] New Jersey argues that "[i]t is not prudent to assume that the all hazards framework could be scaled up to address a radiological incident effectively and efficiently to

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[1] Draft *Federal Register* Notice at 33; NRC Response to Public Comments at 52.
[2] Comment of FEMA (July 24, 2020) at 4.
[3] *Id.* at 5.
[4] *Id.*
[5] Comment of New Jersey (Sept. 21, 2020) at 1-2.

ensure adequate protection of public health and safety."[6] The Conference of Radiation Control Program Directors agrees that, without the pre-planning that goes along with an EPZ, "state and local jurisdictions may not have the expertise necessary to adequately respond to a radiological emergency under their all-hazards plan."[7]

In its letter report on the draft final rule, the Advisory Committee on Reactor Safeguards (ACRS) raises essentially the same concerns. Noting "the reduced operating experience with new nuclear technologies and differences in operating practices of commercial facilities versus" research and test reactors, ACRS recommends revising the rule "to not exclude [FEMA] from being involved in reviewing emergency plans under the rule regardless of the boundaries of the [EPZ] to ensure applicable offsite agencies are capable to coordinate with onsite nuclear emergency organizations."[8] ACRS advises that, "[e]mergency preparedness being the last line of defense for the health and safety of the public, precaution in the case of unforeseen events is prudent."[9]

In my view, we should take these concerns seriously. We should balance a graded approach to emergency planning with the need to ensure adequate emergency preparedness for a SMR or an advanced reactor with a site-boundary EPZ. To achieve this, the NRC staff should update the draft final rule to provide that a site boundary EPZ for a commercial SMR or advanced reactor cannot be established without a written finding from NRC, FEMA, and the host state that offsite response organizations and offsite emergency planning at a particular site would provide for an effective and adequate response in the event of a severe radiological emergency.

A few additional modifications would improve the final rule.

I appreciate the NRC staff's inclusion of a second criterion in the determination of EPZ size. In response to comments that the 1 rem dose formula should not be the sole criterion for determining EPZ size, the staff added a functional criterion "to ensure that the need for predetermined, prompt protective measures is evaluated in the planning considerations."[10] This is a substantial improvement that helps address my earlier concern that the proposed rule was risk-based rather than risk-informed. To effectuate the staff's intent that an EPZ covers the area where the projected dose exceeds 1 rem or "pre-determined, prompt protective measures are necessary," the staff should replace the "and" at the end of § 50.33(g)(2)(i)(A) with an "or".

Second, the draft final rule does not account for the possibility of accidents affecting more than one module or reactor. I agree with New Jersey that "[t]he final rule needs to address emergency preparedness consideration for multiple unit sites."[11] The NRC staff began preparing guidance on this topic and should incorporate key concepts for multi-unit emergency preparedness into the rule.

Third, unlike the existing regulations for large light-water reactors, the draft final rule does "not define the required frequency of drills and exercises" for emergency preparedness.[12]

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[6] *Id.* at 2.
[7] Comment of Conference of Radiation Control Program Directors (Sept. 25, 2020) at 1.
[8] ACRS letter on Draft Final Rule (Nov. 16, 2021) at 1, 3.
[9] *Id.* at 3.
[10] Draft *Federal Register* Notice at 37.
[11] Comment of New Jersey (Sept. 21, 2020) at 4.
[12] Draft *Federal Register* Notice at 46.

As a result, SMR and non-light-water reactor licensees would not be required to conduct a full offsite emergency preparedness drill every 2 years.[13] I agree with the state commenters that the current exercise requirements should be maintained.[14] As New Jersey points out, "[w]ithout the regular discipline of full-scale exercises and frequent smaller scale drills, the risk of delays, errors and inefficiencies in response activities increases."[15] Moreover, conducting periodic exercises "builds relationships so an emergency response official is not sitting across the table from a stranger or calling a name on a list in the midst of an emergency situation."[16]

Finally, the draft final rule would eliminate the ingestion pathway EPZ for SMRs and non-light-water reactors. The NRC staff argues that prior quarantines of spinach and eggs in response to E. Coli and salmonella infections "demonstrate that a response to prevent ingestion of contaminated foods and water could be performed in an expeditious manner without a predetermined ingestion planning zone."[17] I disagree that this *ad hoc* approach is sufficient. According to FEMA, "[a] reactionary, response-oriented approach negates any emphasis on preventing contaminated food from entering commerce, and instead relies on the capabilities of authorities to monitor, detect and interdict contaminated food products after already entering commerce."[18] FEMA points out that, in each of the cases cited by the NRC staff, "the food and injectable drug entered commerce, resulted in numerous injuries, deaths, and significant economic market instability."[19] Before issuing the final rule, the staff should follow FEMA's advice and retain the current ingestion pathway EPZ requirements.

Subject to the modifications discussed above, I approve the draft final rule. The rule will take a substantial step in establishing the regulatory framework for SMRs and advanced reactors. It will recognize the potential for improved designs with lower risks, while maintaining defense-in-depth to protect the public.

[13] *See* NRC Response to Public Comments at 20.
[14] *See* Comment of Conference of Radiation Control Program Directors (Sept. 25, 2020) at 4; Comment of New Jersey (Sept. 21, 2020) at 3, 6.
[15] Comment of New Jersey (Sept. 21, 2020) at 3.
[16] *Id.*
[17] Draft *Federal Register* Notice at 63.
[18] Comment of FEMA (July 24, 2020) at 6.
[19] *Id.*