



FEMA

June 13, 2017

Ms. Stephanie Coffin
Acting Director, Division of Preparedness and Response
Office of Nuclear Security and Incident Response
United States Nuclear Regulatory Commission
Mail Stop T4D22A
Washington, D.C. 20555

SUBJECT: DRAFT REGULATORY BASIS: REQUEST FOR COMMENT, REGULATORY IMPROVEMENTS FOR POWER REACTORS TRANSITIONING TO DECOMMISSIONING

Dear Ms. Coffin:

Please find the attached comments from FEMA Technological Hazards Division (THD) staff regarding *Draft Regulatory Basis; Request for Comment, Regulatory Improvements for Power Reactors Transitioning to Decommissioning*, 82 FR 13,778 (March 17, 2017).

We look forward to continuing discussions on this important issue, and providing additional feedback as this initiative moves ahead. Please do not hesitate to contact me at (202) 507-2294 should you have questions or require further clarification on the areas of concern.

Sincerely,

A handwritten signature in black ink, appearing to read "Jonathan M. Hoyes". To the right of the signature, the text "FOR JMH 6/13/17" is written in a similar cursive style.

FOR JMH 6/13/17

Jonathan M. Hoyes
Director
Technological Hazards Division



FEMA

June 13, 2017

Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: FEMA Comments on Draft Regulatory Basis; Regulatory Improvements for Power Reactors Transitioning to Decommissioning; Request for Comment on Draft Regulatory Basis (Docket ID NRC-2015-0070)

Below are comments from FEMA Technological Hazards Division (THD) staff regarding *Draft Regulatory Basis; Request for Comment, Regulatory Improvements for Power Reactors Transitioning to Decommissioning*, 82 FR 13,778 (Mar. 17, 2017). Should you have any questions, please contact Harry Sherwood at harry.sherwood@fema.dhs.gov.

1. ***Omission of key points in NUREG-0396:*** Appendix III of NUREG-0396, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans In Support of Light Water Nuclear Reactors", Related Issues Considered by the Task Force, considered the issue of a Class 9/Beyond-Design-Basis event and "whether and to what extent, so-called "Class 9" events having consequences beyond the most serious design basis events analyzed for siting purposes, should be considered in developing emergency plans." By stating that a leaking spent fuel pool can be mitigated in ten hours and/or offsite response organizations (OROs) can respond under an all-hazards plan is, in-fact, isolation of a specific design basis or Class 9 accident scenario. The NRC/EPA Task Force recommended that planning for a single scenario not be done. (NUREG-0396, p. III-2). Both the NRC and EPA encouraged State and local agencies to concentrate their efforts on devising capabilities that are versatile and that also take into consideration the unique aspects of radiological accidents. (NUREG-0396, p. III-2).

Per NUREG-0396, "Radiological emergency planning is not based on probabilities, but on public perceptions of the problem and what could be done to protect public health and safety. In essence it is a matter of prudence rather than necessity." (NUREG-0396, p. I-2).

2. ***EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents" (May 1992):*** It appears that the NRC refers to the May 1992 EPA PAG Manual for current licensees that are decommissioning because of backfitting concerns rather than the EPA-400/R-17/001, "PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents" (January 2017). The Draft Regulatory Basis does not address a new licensee who docket their application after the proposed decommissioning rule becomes effective. Which EPA PAG manual would a licensee use who docket their application in the future? There is no difference in the EPA PAG values expressed in either the 1992 EPA PAG manual or the 2017 EPA PAG manual. It is

noteworthy that the discussion of PAG values in the 1992 EPA PAG manual couples PAG values to existing Emergency Planning Zones in the discussion of PAGs, this discussion is continued in the 2017 EPA PAG manual. "The sizes of these EPZs were developed by the NRC/EPA Task Force Report on Emergency Planning, NUREG-0396/EPA 520/1-78-016 (NRC and EPA 1978) and are based, in part, on the numerical values of the PAGs for the plume exposure and ingestion pathway EPZ." (2017 EPA PAG Manual, p. 22). Yet the NRC proposed to do away with EPZs after a period of time in the Option 2 (Tiered EP). This seems to be inconsistent, unclear and confusing.

More importantly, the January 2017 EPA PAG Manual states, "[PAGs] are not meant to be applied as strict numeric criteria, but rather as guidelines to be considered in the context of incident specific factors. PAGs do not establish an acceptable level of risk for normal, non-emergency conditions, nor do they represent the boundary between safe and unsafe conditions." (2017 EPA PAG Manual, p. 1). The Draft Regulatory Basis refers to EPA PAGs several times with the following descriptors: "limits" (p. A-1); "exceedance" (p. A-8); "exceed" (p. A-10); "exceed" (p. A-16); "exceeds" (p. A-17); "exceed" (A-19); "excess" (p. 21); "exceed" (p. A-22); "excess" (p. A-23); and "exceed" (p. A-33). Given the context of how EPA PAG values are used in the Draft Regulatory Basis, the NRC appears to be using and applying EPA PAGs as a strict numeric criteria; essentially using the EPA PAG values before a possible incident as a prime justification for how OROs should respond. Such use does not fit the purpose of the EPA PAG Manual. As stated in the 2017 EPA PAG Manual, "The U.S. Environmental Protection Agency (EPA) has developed this Manual to assist public officials in planning for emergency response to radiological incidents." (2017 EPA PAG Manual, p. 1).

The EPA PAG Manual also includes additional considerations for radiological emergency preparedness, such as the following concepts: "In all cases, all practical and reasonable means should be used to reduce or eliminate exposures." (2017 EPA PAG Manual, p. 13) and "Public protection decisions should be based upon the dose that can be avoided (i.e., avoidable dose) by taking some protective action (e.g., evacuation, shelter-in-place)." (2017 EPA PAG Manual, p. 24).

3. **"Highly unlikely" Zirconium Fire:** "The NRC also relied on analyses that showed that a beyond-design-basis zirconium fire in the spent fuel pool (SFP) is highly unlikely." (p. A-1). A number of references in the Draft Regulatory Basis refers to a "highly unlikely" zirconium fire in a spent fuel pool including: (See NUREG/CR-6451; SECY-00-145; and NUREG-1738). NUREG/CR-6451 describes four configurations of spent fuel. Configuration 1 is described as "hot fuel" such that a spent fuel fire is possible. NUREG/CR-6451 recommended full EP for Configuration 1 fuel. SECY-00-145 states that a zirconium fire is possible for 5 years in a spent fuel pool. NUREG-1738 states that a zirconium fire is possible even beyond the 5 year period mentioned in SECY-00-145, and NUREG-1738 also states that a zirconium fire could have consequences as serious as a core melt. Consequences as serious as a core melt could include exceeding the EPA PAGs.

In the Draft Regulatory Basis, 10 hours to mitigate a leaking spent fuel pool before a zirconium fire can occur is an acceptable risk. (p. A-21). The Draft Regulatory Basis asserts that, should mitigation fail and a zirconium fire occur, that ORO's response to the unique radiological hazard of a release exceeding the EPA PAG offsite using an all-hazards plan is

an acceptable risk. Both of these determinations were made without consultation with FEMA. At minimum, FEMA and the OROs should be engaged in dialog with the NRC when it comes to discussion regarding the hazard, any mitigation assistance the licensee is anticipating from offsite, and a determination of what is an acceptable amount of risk for offsite health and safety as well as what is appropriate preparedness to counter that risk.

The Draft Regulatory Basis refers to several terms expressing the unlikeliness of a zirconium fire and expressions of probability related to a zirconium fire. (See, e.g., “beyond- design-basis zirconium fire in the spent fuel pool (SFP) is highly unlikely” (p. A-1); “a postulated, but highly unlikely beyond-design-basis accident” (p. A-2); “informed by probability considerations” (p. A-5); “two orders of magnitude lower” (p.A-6); “unlikely occurrence of a zirconium fire” (p. A-11); “highly unlikely” (p. A-13); “probability of a condition reaching the level above an emergency classification of Alert is very low” (p. A-19); and “increased probability that decay heat will be low enough.” (p. A-21). As stated in NUREG-0396, radiological emergency planning is not based on probabilities but on public perception of the problem. (NUREG-0396, p. I-2).

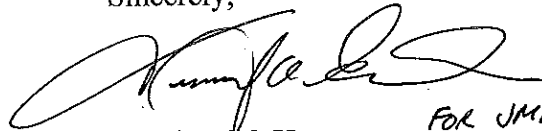
As described in the Draft Regulatory Basis, the NRC has received numerous public comments from stakeholders regarding offsite emergency preparedness and concerns that a zirconium fire in a spent fuel pool could pose a problem. For example, local governments “generally opposed relaxation of EP until the spent fuel is removed from the spent fuel pool,” and State governments “echoed all of the concerns expressed by local government, private citizens and citizen advocacy groups.” (pp. 42-43). In addition, in a letter to the NRC, ten members of the United States House of Representatives and five members of the United States Senate urged the NRC to “ensure that all emergency preparedness and response and security resources and licensing requirements remain in place until all spent fuel is placed into safer dry cask storage.” (p. 44).

4. ***Task 1 Report and Challenge of Earthquakes and Large Plane Crashes: The Task 1 Report***, “A Human Reliability Analysis of the Safety of the Spent Fuel in the Spent Fuel Pool of Decommissioning Nuclear Plants” referenced in the Draft Regulatory Basis is a recent study confirming that 10 hours is available to mitigate a damaged spent fuel pool before a zirconium fire can start. (p. A-9). The study states that the 10 hour time frame is challenged by earthquakes and large plane crashes. (p. A-7). During one of these challenging events the OROs will also be responding to the earthquake or large plane crash in their jurisdiction, meaning that the expectation is that the OROs will provide onsite support to the licensee while also fulfilling their main responsibility to protect the health and safety of the public. By not including the challenge of earthquakes and large plane crashes in the 10 hour mitigation strategy this excludes the allowance for OROs to figure out how they would respond to the incident. Unplanned response to the offsite/onsite consequences is an issue of concern.
5. ***All hazards response, NRC reliance on residual knowledge and skill in REP communities and disregard of the unique aspects of the radiological hazard:*** The Draft Regulatory Basis states that the OROs can respond using an all-hazards approach rather than the formal offsite REP programs that existed during operation of the reactor. All-hazards response implies that there is nothing unique about the radiological hazard compared to other hazards. However, NUREG-0396 describes the radiological hazard as unique. (NUREG-0396, p. III-2).

When the NRC states that the OROs can respond using an all-hazards response, the NRC is believing that the “muscle memory” of formal REP knowledge and skill will carry the day, as explained on page 12 of Attachment 1 of SECY-00-145, “The staff believes that the residual knowledge and capability built into offsite emergency response programs would continue for some time after the requirement for radiological EP are removed.” As provided in the Draft Regulatory Basis, stakeholder input comments suggest that communities near recently decommissioning plants are showing greater than expected capability reduction. (See pp. 41 to 44). Emergency preparedness should not be based on the efficacy of residual knowledge and capability. Emergency preparedness in communities near decommissioning nuclear power plants should be based on the unique nature of the radiological hazard and the capabilities required to successfully mitigate, respond to, and recover from the offsite consequences of a possible zirconium fire as long as spent fuel remains in the spent fuel pool.

FEMA looks forward to the continued discussion with the NRC as the Draft Regulatory Basis evolves. Should you have any questions or comments on the content of this document, please feel free to reach out to Harry Sherwood at harry.sherwood@fema.dhs.gov.

Sincerely,



Jonathan M. Hoyes

Director

Technological Hazards Division

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