



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 26, 2019

Michael S. Casey, Ph.D.
Director, Technological Hazards Division
Federal Emergency Management Agency - Area 8
400 C Street, South West
Washington, DC 20024

SUBJECT: RESPONSE TO FEDERAL EMERGENCY MANAGEMENT AGENCY
COMMENTS ON THE STAFF EVALUATION FOR THE PROPOSED
PILGRIM NUCLEAR POWER STATION EMERGENCY PLAN
EXEMPTION REQUEST COMMISSION PAPER

Dear Dr. Casey:

By letter dated February 20, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19057A234), the Federal Emergency Management Agency (FEMA) provided comments to the U.S. Nuclear Regulatory Commission (NRC) on a draft, non-public version of a Commission paper entitled "Request by the Entergy Nuclear Operations, Incorporated, for Exemptions from Certain Emergency Planning Requirements for Pilgrim Nuclear Power Station." The draft Commission paper was provided to FEMA to allow the opportunity to ask questions, seek clarification, comment, and consult with the NRC prior to the Commissioners' consideration of the requested exemptions.

As always, the NRC appreciates the comments provided by FEMA in relation to offsite radiological emergency preparedness (REP) plans for power reactors that are in decommissioning and values the open and frank dialog between the agencies. FEMA's comments have been reviewed by my staff, and the requested statements for inclusion in the Commission paper, along with NRC's responses, are contained in Enclosure 1, "Historical Perspective and Staff Evaluation Considerations," to Commission paper SECY-19-0078, "Request by Entergy Nuclear Operations, Inc for Exemptions from Certain Emergency Planning Requirements for the Pilgrim Nuclear Power Station" (ADAMS Accession No. ML18347A717), under the paragraph entitled "Spent Fuel Pool Offsite Radiological Emergency Preparedness Considerations." SECY-19-0078 and its enclosures have been made publicly available for viewing in ADAMS.

The enclosure to this letter provides responses to other comments made in FEMA's February 20, 2019 letter, which were not requested to be included in the Commission paper.

I appreciate the opportunity to continue the exchange of views on REP-related elements associated with the on-going NRC Decommissioning Rulemaking and requests for exemptions from regulations for NRC-licensed power reactors, which have or plan to permanently cease power operations and permanently remove fuel from the reactor vessel. The ongoing collegial dialog between the NRC and FEMA on REP aspects associated with the proposed rulemaking and licensing activities has supported the strong partnership between the two agencies.

If you have any questions regarding the NRC's responses to FEMA's comments contained in the enclosure to this letter or to FEMA's statements in Enclosure 1 to SECY-19-0078, please contact me at (301) 287-3735 or Joseph Anderson at (301) 287-9300.

Sincerely,

/RA/

Michael L. Scott, Director
Division of Preparedness and Response
Office of Nuclear Security and Incident Response

Enclosure:
NRC Responses to Certain FEMA Comments on Draft SECY Paper

cc: H. Hart, FEMA HQ
V. Quinn, FEMA HQ

SUBJECT: RESPONSE TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY
COMMENTS ON PROPOSED COMMISSION PAPER FOR THE PILGRIM
NUCLEAR POWER STATION EMERGENCY PLAN EXEMPTION REQUEST

DATE: August 26, 2019

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NRC Responses to Certain FEMA Comments on Draft SECY Paper

This enclosure is intended to address comments made by the Federal Emergency Management Agency (FEMA) in its letter dated February 20, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19057A234), which were not requested to be included in the final Commission paper. The responses in this enclosure, along with those provided in Enclosure 1, "Historical Perspective and Staff Evaluation Considerations to SECY-19-0078, "Request by Entergy Nuclear Operations, Inc. for Exemptions from Certain Emergency Planning Requirements for the Pilgrim Nuclear Power Station" (ADAMS Accession No. ML18347A717), are intended to address all comments provided by FEMA in its February 20, 2019 letter.

FEMA Comment 1: Specifically, we appreciate the NRC's response to FEMA Region I's request for information regarding the difference in timing between the 10-hour threshold value approved back in 2016 for Vermont Yankee and that proposed by Entergy for Pilgrim. We understand that the time period to meet the 10-hour threshold is based on site-specific reactor analysis and assumptions. Moreover, the NRC's Office of Nuclear Reactor Regulations/Division of Safety Systems (NRR/DSS), will provide a separate overall safety evaluation report for the requested exemptions prior to forwarding the proposed SECY paper to the Commission. FEMA requests an opportunity to view that separate safety evaluation once it is prepared

Response: Entergy provided its adiabatic heatup analysis for Pilgrim Nuclear Power Station (PNPS) spent fuel pool in Attachment 2, "Calculation No. PNPS-EC-81416-M1418, Adiabatic Heatup Analysis for Drained Spent Fuel Pool," of its letter dated February 18, 2019 (ADAMS Accession No. ML19056A260). By email dated May 23, 2019 (ADAMS Accession No. ML19148A531), the NRC provided to FEMA the ADAMS hyperlink to the adiabatic heatup analysis. The NRC's evaluation of the heatup analysis is summarized in Enclosure 2, "Evaluation of Request by Entergy Nuclear Operations, Inc. for Exemptions from Certain Emergency Planning Requirements for the Pilgrim Nuclear Power Station," to SECY-19-0078. SECY-19-0078, as well as Attachment 2 to Entergy's February 18, 2019 letter, are publicly available for viewing by FEMA staff in ADAMS under Accession numbers listed.

An offer was also extended for the FEMA Technological Hazards Division staff to meet with representatives from the NRC staff who reviewed the adiabatic heatup analysis for the purpose of helping FEMA understand the analysis. However, the decision on the adequacy of this analysis and its application in regard to the proposed PNPS emergency planning exemptions remains the sole responsibility of the NRC.

FEMA Comment 2: Based upon analysis from recent decommissioning efforts, the FEMA regional program representatives anticipate over time a significant reduction in preparedness and response capabilities at both the state and local level resulting from this Pilgrim Nuclear Power Station (PNPS) decommissioning exemption. Specifically, there may be some budget reallocation required to address state and local funding gaps (namely salaries, training, and equipment) resulting in an overarching degradation of the Commonwealth's ability to plan for, examine, and validate the whole community's ability to build, sustain and deliver necessary capabilities to achieve the National Preparedness Goal of a secure and resilient Nation.

Response: Current NRC regulations provided in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.47 govern the level of on-site and off-site emergency preparedness required for an operating large light water reactor (LLWR) for an emergency involving the release of radioactivity to the environment. These regulations and their planning basis are based upon an anticipated prompt response to a wide

spectrum of events for an operating LLWR. However, for a nuclear power reactor that has permanently ceased operations, the spectrum of accidents that can have significant offsite consequences is greatly reduced. At a nuclear power reactor that has permanently ceased operations, the only accident scenario at the site that might lead to a significant radiological release is a highly unlikely, beyond design-basis event resulting in a potential spent fuel zirconium cladding fire. This event involves a postulated major loss of water inventory from the spent fuel pool (SFP), where preplanned SFP mitigation measures were unsuccessful, generating a significant heatup of the spent fuel to the point where substantial zirconium cladding oxidation and fuel damage can occur.

The amount of decay heat in the spent fuel is directly associated with the amount of time since the reactor permanently ceased operations. Therefore, the probability of a zirconium cladding fire scenario continues to decrease as a function of the time since the nuclear power reactor has permanently ceased operations. As such, the potential for the conditions needed for a zirconium cladding fire to occur continues to decrease as a function of the time since permanent cessation of operations. However, current regulations do not reflect that: (1) considerably more time is available during decommissioning to respond to a postulated zirconium cladding fire incident than is available for many postulated operating power reactor accidents, and (2) comprehensive SFP mitigation measures and on-shift staff remain in place following the permanent cessation of power operations. The Commission has determined that a minimum threshold of 10 hours from the time of a complete loss of SFP water inventory with no heat loss (adiabatic heatup) provides sufficient time to implement pre-planned mitigative measures to preclude a radiological release.

The NRC staff believes that for all but the most unlikely events, any offsite protective actions would be taken by governmental officials as a precautionary measure. In the highly unlikely event of a beyond-design-basis accident resulting in a loss of the SFP water inventory, there would be time to initiate appropriate SFP mitigating actions. If State or local governmental officials determine that offsite protective actions are warranted, then sufficient time and capability would be available for offsite response organizations to implement these measures using a Comprehensive Emergency Management Program (CEMP), "all-hazards," approach.

In addition, the studies conducted, as cited in Enclosure 1 to SECY-19-0078, have found the risk of a zirconium cladding fire in the SFP to be low and well within the Commission's safety goals. As such, the risk to the public from a highly unlikely, beyond-design basis event no longer justifies the level of offsite radiological emergency planning by State, local, and Tribal offsite organizations currently required under 10 CFR 50.47. The requested exemptions seek to establish a level of emergency planning commensurate with the risk of a radiological emergency at a nuclear power plant site that has permanently ceased operations.

FEMA Comment 3: As the NRC's decommissioning rulemaking process moves forward, FEMA welcomes the opportunity to share and discuss our concerns with the draft regulatory text prior to the public comment period. For example, FEMA is most interested in discussing: a) the assumptions associated with the DBA [Design Basis Accident] and beyond DBA risk/mitigation assessments; and b) the assumptions associated with the EPZ [emergency planning zone] determinations to include the use of the PAGs [protective actions guidelines] as "limits" vice guides. FEMA has conducted an initial analysis of the draft regulatory text and will forward our comments via memorandum not later than February 28, 2019.

Response: The NRC appreciates FEMA's views regarding proposed changes to emergency planning regulations for decommissioning reactors and welcomes continued dialog on issues of concern to FEMA, as well as State, local and Tribal governmental authorities. Formal comments provided to the NRC will be considered as part of the rulemaking process, and NRC staff will continue to support outreach efforts to external government stakeholders.

The EPZ considerations in the rulemaking are consistent with the long-standing relationship between the EPZ size and the U.S Environmental Protection Agency (EPA) early phase PAGs as documented in many places, including NUREG-0396, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," and EPA-400/R-17/001, "PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents." These documents affirm that the EPZ sizes are based, in part, on the numerical values of the PAGs for the plume exposure and ingestion pathway EPZ. The EPZs should be large enough to cover affected urban and rural areas and accommodate the various organizations needed for emergency response. Although the size of the EPZ is based on the maximum distance at which a PAG might be exceeded, the actual boundary of an EPZ should be demarcated by features readily identifiable by people within that area. Such boundaries generally include major topographical features (e.g., rivers, roads, transmission line corridors, rail rights of way) and political boundaries.