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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of:

Consideration of Rulemaking To Address Prompt
Remediation of Residual Radioactivity During
Operation

RIN 3150-AJ17

NRC-2011-0162

**Comments of the State of Vermont, Agency of Natural Resources,
Department of Health, and Department of Public Service**

Submitted: August 22, 2016

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INTRODUCTION

The State of Vermont, Agency of Natural Resources (ANR), Department of Health, and Department of Public Service (DPS), submit these comments in response to the U.S. Nuclear Regulatory Commission (NRC) July 6, 2016 *Notice of Public Webinar and Request for Comment*, 81 FED. REG. 129 (July 6, 2016). This Notice was issued in an effort to collect comments and information on the implementation of the Decommissioning Planning Rule (DPR) and the need for a potential rulemaking to address prompt remediation of residual contamination at operational nuclear facilities. The State appreciates the opportunity to share its experiences regarding contamination at Vermont Yankee Nuclear Power Station (Vermont Yankee) in support of a requirement for prompt remediation of radiological contamination at operational nuclear facilities.

This submission incorporates and supplements comments made by the State in previous submissions and presentations. Mr. Anthony R. Leshinskie of the Vermont DPS and Dr. William Irwin of the Vermont Department of Health participated by webinar in the Public Meeting held by the NRC on July 11, 2016; their presentation made during the webinar regarding radiological contamination at nuclear plant sites, and groundwater protection and stakeholder engagement at Vermont Yankee, should be considered in addition to the comments made in this filing. Additionally, as part of a multi-state filing made to the NRC on March 18, 2016, the State submitted comments on the need for regulatory improvements for decommissioning power reactors.¹ That submission addressed the State's experience in regulation of Vermont Yankee and the State's strong interests in regulatory requirements for nuclear power reactors that are protective of public health and the environment. Though that filing was focused mainly on decommissioning facilities, it outlined the critical need for early investigation and prompt remediation of radiological

¹ See *Comments of the State of Vermont, the Commonwealth of Massachusetts, and the States of Connecticut and New York, RIN 3150-AJ59, NRC-2015-0070*, (Mar. 18, 2016) (ADAMS Accession No. ML16085A310).

and non-radiological contamination identified at nuclear facilities prior to decommissioning. Many of the arguments made therein are relevant to the comments made in this filing, and should also be considered by the NRC in the context of this proceeding regarding the need for prompt remediation of residual radioactive contamination at operational facilities.

This filing is organized to respond to Specific Questions 2, 6, and 10 as they appear in Section II of the Notice. In accordance with NRC's Principles of Good Regulation², the State requests that the NRC consider the information in this filing as part of the best available knowledge from stakeholder operational experience, and share this information and results of its analysis of this data with other licensees, stakeholders, and the public as a part of this proceeding.

QUESTION 2: *Based on the information on site contamination obtained from facilities that have entered decommissioning, should the NRC proceed with additional rulemaking to address remediation of residual activity during the operational phase? Why or why not?*

RESPONSE: The Vermont ANR, Department of Health, and DPS are strongly in favor of the adoption and the strict enforcement of a rule requiring prompt remediation of radiological contamination identified during the operational phase of a nuclear facility. This conclusion is based directly on information on site contamination obtained from Vermont Yankee, which ceased operations on December 29, 2014, and has since entered decommissioning.

The NRC asserts that neither the DPR, nor any other current federal regulations, requires licensees to promptly remediate radiological contamination.³ This failure to require prompt remediation of contamination has several negative effects. An extensive analysis of these potential risks of delayed remediation (and delayed decommissioning more generally) are outlined in

² NRC, *Values: Principles of Good Regulation*, <http://www.nrc.gov/about-nrc/values.html#principles>. Last visited August 17, 2016.

³ 81 FED. REG. 129, Section II (July 6, 2016).

Section V of the March 18 multi-state filing, and should be considered in addition to the commentary included here.

To begin, the failure to require prompt remediation increases the chance that contamination will spread. This increases risks to the environment and public health and safety. As the State has previously argued⁴, the position that decommissioning and remediation costs are limited or decreased by allowing radioactive materials to decay in the environment over a period of time has not been observed in reality, and should no longer serve as a basis for allowing delayed remediation of radiological contamination. Radionuclides found at sites have had moderately long half-lives (i.e., tritium, cesium-137, and strontium-90) or in some cases, very long half-lives (i.e., transuranics, isotopes of plutonium, neptunium, and americium). Typically, while decay may reduce the radioactivity of these materials, actual total waste volumes are not decreased because the reduction is not enough to make radioactive materials non-radioactive. The argument for delayed remediation is further negated when the possible fate of any radioactive materials allowed to remain on site include public food supplies, water, and land.

More to the point, contamination allowed to remain and spread on site has the potential to cross-contaminate other leaking or migrating materials (including other wastes) that may be latent in the site's soils or groundwater, increasing total volumes of waste that require remediation. For example, disposal of the ongoing groundwater incursions into the Vermont Yankee Turbine Building has been complicated due to the incursion water becoming contaminated by residual radioactive contamination in and around the Turbine Building foundation. Prompt remediation of the residual radioactive contamination would have greatly reduced, if not eliminated,

⁴ See Section V (pp 34-43) of *Comments of the State of Vermont, the Commonwealth of Massachusetts, and the States of Connecticut and New York, RIN 3150-AJ59, NRC-2015-0070*, (Mar. 18, 2016) (ADAMS Accession No. ML16085A310).

contamination concerns regarding management and disposal of the contaminated incursion water from the Vermont Yankee site. Cross-contamination of non-radiological contamination is especially undesirable because the management and disposal of mixed wastes costs more than disposal of non-mixed wastes. There are far fewer disposal facilities available that can accept mixed wastes, and utilizing facilities to receive and manage mixed wastes can require review and approval from the NRC. These factors (limited facilities, NRC licensing action) can cause a significant increase in overall decommissioning costs. Additionally, as stated in the response to Question 6 below, the failure to promptly remediate contamination at a site, and any resulting spread and/or cross-contamination of other environmental media and structures, has the potential to increase decommissioning costs and site restoration costs.

Requiring prompt remediation at an operational facility enables a facility to utilize response resources available at the time of the contamination incident. Emergency responders and operators that are most familiar with the facility site and operations are the most capable of effective remediation at an early stage. With no requirement for prompt remediation, adequate investigation and remediation of contamination may occur years after the facility shuts down and reduces personnel and other resources, leaving remediation to people and entities that lack sufficient institutional knowledge of the site, contamination, and other site-specific skills. This challenge may be compounded by the lack of accurate and thorough facility recordkeeping on the location and extent of on-site contamination.

An NRC requirement for prompt remediation of radiological contamination identified at a facility should necessitate a full investigation of the contaminated area, allowing for the characterization of both radiological and non-radiological contamination simultaneously. This would reduce the likelihood of discovering unexpected contamination or cross-contamination at a later time or after decommissioning activities have commenced, would preserve funds set aside for

decommissioning and site restoration activities, and would be carried out efficiently by current personnel and emergency response entities that are most familiar with the facility and its operations. The NRC requirement for prompt remediation should apply to all facilities, regardless of when they were licensed.

QUESTION 6: *If the NRC implements a rule that allows licensees to analyze residual radioactivity to justify delaying remediation, then what should the licensee's analysis cover?*

RESPONSE: For the reasons addressed above in the response to Question 2, when radiological contamination is identified on site at an operational facility, the contamination should be promptly and fully investigated and remediated. Any exemptions created to the requirement for prompt remediation should only apply to exceptional situations based on objective criteria (i.e., such as where contamination migrates under an active facility structure and cannot be fully remediated with the structure in place and the plant in the operational phase). Any exemption should be weighed carefully as decommissioning at some reactor sites (e.g., Yankee Rowe, Maine Yankee, and Connecticut Yankee) uncovered large reservoirs of contaminated groundwater that had been dammed up by deep foundations – a situation that may drive contamination deeper into sub-surfaces where groundwater and drinking water sources may be impacted. As a necessary component of such an exemption, licensees must be required to fully investigate contamination that is allowed to remain on site, actively monitor any health and environmental risks posed, maintain accurate records of the contamination, and routinely notify the NRC, state regulatory bodies and local municipalities of any risks or changes in risks. As stated in Section VI of the March 18, 2016 multi-state filing, the implementation of environmental monitoring and an ongoing environmental surveillance program are critical if the NRC continues to allow delays in decommissioning, and is especially critical in monitoring any contamination that is not promptly remediated upon discovery.

QUESTION 10: *What other issues should the NRC staff consider in developing a technical basis for a potential rulemaking to address prompt remediation of residual radioactivity during site operation?*

RESPONSE: In addition to the above responses, a rule requiring prompt remediation of contamination identified during the operational life of the facility should identify that other NRC regulations explicitly prohibit the use of funds specifically set aside for decommissioning and site restoration of the facility upon its closure.

Historical records indicate that prompt remediation could have saved substantial sums during the decommissioning of several nuclear power plants here in New England. For instance, extensive radiological (and non-radiological) contamination was found during the decommissioning of Yankee Rowe, Connecticut Yankee, and Maine Yankee that increased the final costs of decommissioning at those facilities. Had the locations of tritium, strontium-90 and transuranic contamination at those sites been promptly remediated, total decommissioning costs may have been many millions of dollars less. Specifically, as discussed in Section VI of the March 18, 2016 multi-state filing with regard to the decommissioning of Maine Yankee, the licensee discovered pockets of highly contaminated groundwater dammed up by existing structures, which lead to significant cost increases for decommissioning of the plant and use of funds specifically set aside for decommissioning activities. It is more appropriate that costs for contamination identified during the operational life of a facility be covered by revenues obtained during operations when the contamination occurred rather than utilizing funds set aside specifically for decommissioning and restoration of the site after closure. Anything less would create a disincentive for operator responsibility and vigilance during the period of ongoing operations.

A final point to be made is that the protections provided by reactor licensee adherence to the Nuclear Energy Institute's Groundwater Protection Initiative should be maintained and strengthened. Most importantly, these protective measures should remain required of the licensee

until license termination. The DPR supports stakeholder engagement in the same fashion as the Groundwater Protection Initiative. Stakeholder engagement fosters more trust in licensee performance and environmental protection.

Conclusion

The State of Vermont appreciates the opportunity to provide these comments, information, and data on prompt remediation of radiological contamination at operational nuclear facilities.