

**NUCLEAR REGULATORY COMMISSION**

[Docket Nos. 72-1014, 72-59, and 50-271; NRC-2017-0134]

**Entergy Nuclear Operations, Inc.**

**Vermont Yankee Nuclear Power Station**

**Independent Spent Fuel Storage Installation**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Exemption; issuance.

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC) is issuing an exemption in response to a request submitted by Entergy Nuclear Operations, Inc. (Entergy) on November 9, 2016, and supplemented on January 9, 2017, for its general license to operate an independent spent fuel storage installation (ISFSI) at the Vermont Yankee Nuclear Power Station (VYNPS). This exemption would permit the VYNPS to load and store certain low-enriched channeled undamaged fuel assemblies with higher enriched fuel assemblies in the same HI-STORM 100 multi-purpose canister (MPC)-68M using Certificate of Compliance (CoC) No. 1014, Amendment No. 10.

**DATES:** June 14, 2017.

**ADDRESSES:** Please refer to Docket ID **NRC-2017-0134** when contacting the NRC about the availability of information regarding this document. You may obtain publicly-available information related to this document using any of the following methods:

- **Federal Rulemaking Web Site:** Go to <http://www.regulations.gov> and search for Docket ID **NRC-2017-0134**. Address questions about NRC dockets to Carol Gallagher; telephone: 301-415-3463; e-mail: [Carol.Gallagher@nrc.gov](mailto:Carol.Gallagher@nrc.gov). For technical questions, contact the individual listed in the FOR FURTHER INFORMATION CONTACT section of this document.

- **NRC's Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly-available documents online in the ADAMS Public Documents collection at <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "[ADAMS Public Documents](#)" and then 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, 301-415-4737, or by e-mail to [pdr.resource@nrc.gov](mailto:pdr.resource@nrc.gov). The ADAMS accession number for each document referenced (if it is available in ADAMS) is provided the first time that it is mentioned in this document.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

**FOR FURTHER INFORMATION CONTACT:** Yen-Ju Chen, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555; telephone: 301-415-1018; e-mail: [Yen-Ju.Chen@nrc.gov](mailto:Yen-Ju.Chen@nrc.gov).

## **SUPPLEMENTARY INFORMATION:**

### **I. Background**

The VYNPS began operation in 1972. The reactor was permanently shut down on December 29, 2014. The VYNPS currently stores spent boiling-water reactor (BWR) fuel assemblies at its ISFSI in thirteen (13) HI-STORM 100 casks under CoC No. 1014, Amendment No. 2. The remaining spent fuel assemblies were removed from the reactor and transferred to the spent fuel pool. Entergy, which owns the facility, submitted the VYNPS Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC on December 19, 2014. In the PSDAR, Entergy stated its intention to move all of the spent nuclear fuel assemblies into dry cask storage by 2020 and put the plant into SAFSTOR<sup>1</sup> until it is ready to fully decommission the facility.

Consistent with subpart K of part 72 of title 10 of the *Code of Federal Regulations* (10 CFR), a general license is issued for the storage of spent fuel in an ISFSI at power reactor sites to persons authorized to possess or operate nuclear power reactors under 10 CFR part 50. Entergy is currently authorized to store spent fuel at the VYNPS ISFSI under the 10 CFR part 72 general license provisions. Entergy plans to use Holtec HI-STORM 100 storage casks, as approved by the NRC under CoC No. 1014, Amendment No. 10, at the VYNPS for dry storage of spent nuclear fuel in MPC-68M canisters.

### **II. Request/Action**

By letter dated November 9, 2016, as supplemented on January 9, 2017, Entergy submitted a request for an exemption from those provisions of 10 CFR 72.212(a)(2),

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<sup>1</sup> A method of decommissioning in which a nuclear facility is placed and maintained in a condition that allows the facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use.

72.212(b)(3), 72.212(b)(5)(i), 72.212(b)(11), and 72.214 that require compliance with the terms, conditions, and specifications of CoC No. 1014, Amendment No. 10, for the VYNPS to load and store certain low-enriched channeled undamaged fuel assemblies with higher enriched fuel assemblies in the same Holtec HI-STORM 100 MPC-68M canister.

### **III. Discussion**

Pursuant to 10 CFR 72.7, the Commission may, upon application by any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations of 10 CFR part 72 as it determines are authorized by law and will not endanger life or property or the common defense and security, and are otherwise in the public interest.

The NRC staff prepared a safety evaluation report (SER) (ADAMS Accession No. ML17054C788) to document the evaluation of the proposed mixed-enrichment fuel loading arrangement to assure continued protection of public health and safety, common defense and security, and the environment. As summarized below, the NRC's safety review concludes that the requested exemption does not affect the ability of the cask system to meet the requirements of 10 CFR part 72.

#### **A. The Exemption is Authorized by Law**

This exemption would permit the VYNPS to load and store certain low-enriched (up to 3.3 wt.% U-235) channeled BWR fuel assemblies classified as undamaged per CoC No. 1014, Amendment No. 10, in the same MPC with higher enriched (planar-average initial enrichment up to 4.8 wt.% U-235) BWR fuel assemblies. The provisions from which the NRC is granting the exemption require the VYNPS to follow the conditions of CoC No. 1014, Amendment No. 10, that when loading certain low-enriched channeled undamaged BWR fuel assemblies in an MPC-68M, all fuel assemblies in the same MPC are limited to 3.3 wt.% U-235 maximum planar-average initial enrichment.

Section 72.7 allows the Commission to grant exemptions from the requirements of 10 CFR part 72 if the exemption is authorized by law and will not endanger life or property nor the common defense and security. Issuance of this exemption is consistent with the Atomic Energy Act of 1954, as amended, and not otherwise inconsistent with NRC's regulations or other applicable laws. Therefore, issuance of the exemption is authorized by law.

#### **B. The Exemption Presents no Undue Risk to Public Health and Safety**

Approval of this exemption request will allow VYNPS to load and store certain low-enriched channeled undamaged BWR fuel assemblies in the same HI-STORM 100 MCP-68M canister, with higher enriched BWR fuel assemblies. As discussed in the SER and summarized in the following sections, the NRC staff finds that Entergy's proposed action is acceptable and will not endanger life or property.

##### *Review of the Requested Exemption*

The classification of certain low-enriched channeled BWR fuel as undamaged for the Holtec HI-STORM 100 system was reviewed previously and approved by the NRC in Amendment No. 9, Revision 1, on March 21, 2016. The CoC has a restriction that when loading certain low-enriched channeled undamaged BWR fuel (limited to 3.3 wt.% U-235), all fuels in the same MPC are limited to 3.3 wt.% U-235 maximum planar-average initial enrichment.

Entergy stated that the VYNPS has a large number of assemblies that fall into the category of low-enriched channeled undamaged BWR fuel. These assemblies can be mixed with higher enriched fuel in the same cask to reduce dose rates because placing the low-enriched assemblies on the periphery of the cask acts as shielding and blocks the radiation from the higher-enriched fuels stored in the center of the cask. In order to reduce maximum dose

rates from the casks for the decommissioning loading plan, Entergy is seeking an exemption from the loading restriction.

The NRC staff reviewed the requested exemption and determined that it does not change the fundamental design, components, or safety features of the storage system. The NRC staff evaluated the applicable potential safety impacts of granting the exemption to assess the potential for any danger to life or property or the common defense and security. Specifically, the NRC staff reviewed the applicant's criticality and shielding evaluations for the proposed exemption.

*Criticality Review for the Requested Exemption:* The NRC staff evaluated the adequacy of the description, methods, and analyses related to the criticality evaluation for the requested action to ensure that the storage of higher enrichments with low enriched channeled undamaged fuel in the same MPC-68M meets the criticality safety requirements of 10 CFR part 72. The NRC staff concludes that the HI-STORM 100 Cask System continues to meet the regulatory requirements that the dry cask storage system as modified will continue to remain subcritical under all credible normal, off-normal, and accident conditions and provide reasonable assurance for safe storage of spent fuel.

*Shielding Review for the Requested Exemption:* The objective of the review is to ensure that, with the exemption request, the VYNPS continues to provide adequate protection against direct radiation to the onsite operating workers and members of the public, and that the ISFSI continues to satisfy the regulatory requirements during normal operating, off-normal, and design-basis accident conditions. The NRC staff found that the mixing of lower enriched fuel (at 3.3 wt.% U-235) and higher enriched fuel (up to 4.8 wt.% U-235) reduced the overall dose rates. Therefore, the staff concludes that granting this exemption assures that the VYNPS ISFSI

continues to satisfy the dose limits as specified in 10 CFR 72.104. It also provides benefit to the onsite workers and the public.

### **C. The Exemption is Consistent with the Common Defense and Security**

*Review of Common Defense and Security:* The NRC staff also considered potential impacts of granting the exemption on the common defense and security. The requested exemption is not related to any security or common defense aspect of the VYNPS ISFSI, therefore granting the exemption would not result in any potential impacts to common defense and security.

Based on its review, the NRC staff has determined that under the requested exemption, the storage system will continue to meet the safety requirements of 10 CFR part 72 and the offsite dose limits of 10 CFR part 20 and, therefore, will not endanger life or property. The NRC staff also finds that the exemption would not endanger common defense and security.

### **D. Otherwise in the Public Interest**

In considering whether granting the exemption is in the public interest, the NRC staff considered the alternative of not granting the exemption. If the exemption was not granted, in order to comply with the CoC, when the VYNPS loaded certain low-enriched channeled undamaged BWR fuel, all fuels in the same MPC would be limited to 3.3 wt.% U-235 maximum planar-average initial enrichment.

Entergy stated that granting the exemption is in the public interest since it will reduce operational dose rate by loading certain low-enriched channeled undamaged BWR fuel with higher enriched BWR fuel in the same MPC, and NRC staff confirms this statement in Section B.6 of the SER. Additionally, granting the exemption would support VYNPS's cask loading schedule as part of its decommissioning effort.

The NRC staff concludes that allowing the VYNPS to load certain low-enriched channeled undamaged BWR fuel with higher enriched BWR fuel in the same MPC would continue to provide adequate protection of public health and safety. Therefore, granting the exemption is otherwise in the public interest.

#### **E. Environmental Considerations**

The NRC staff also considered whether there would be any significant environmental impacts associated with the exemption. For this proposed action, the NRC staff performed an environmental assessment pursuant to 10 CFR 51.30. The environmental assessment concluded that the proposed action would not significantly impact the quality of the human environment. The NRC staff concluded that the proposed action would not result in any changes in the types or amounts of any radiological or non-radiological effluents that may be released offsite, and there is no significant increase in occupational or public radiation exposure because of the proposed action. The Environmental Assessment and the Finding of No Significant Impact was published on June 6, 2017 (82 FR 26144).

#### **IV. Conclusions**

Accordingly, the Commission has determined that, pursuant to 10 CFR 72.7, this exemption is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest. Therefore, the Commission hereby grants Entergy an exemption from those provisions of 10 CFR 72.212(a)(2), 10 CFR 72.212(b)(3), 10 CFR 72.212(b)(5)(i), 10 CFR 72.214, and the portion of 10 CFR 72.212(b)(11) that require compliance with terms, conditions, and specifications of the CoC No. 1014, Amendment No. 10, for the VYNPS to load and store certain low-enriched channeled undamaged fuel assemblies with higher enriched fuel assemblies in the same Holtec HI-STORM 100 MPC-68M canister.



## V. Availability of Documents

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

Document	ADAMS Accession No.
Entergy's exemption request, November 9, 2016	ML16319A102
Entergy's supplemental information, January 9, 2017	ML17010A300
Certificate of Compliance No. 1014, Amendment No. 10 for the HI-STORM 100 Cask System, dated May 25, 2016	ML16144A177
Vermont Yankee Nuclear Power Station Post-Shutdown Decommissioning Activities Report, December 29, 2014	ML14357A110
NRC's SER for the exemption request, dated May 26, 2017	ML17054C788
CoC and SER for Amendment No. 9, Revision 1, to CoC 1014 issued on March 21, 2016	ML16056A529
Environmental Assessment (82 FR 26144, June 6, 2017)	ML16343A859

The exemption is effective upon issuance.

Dated at Rockville, Maryland, this 6 day of June, 2017.

For the Nuclear Regulatory Commission.

**/RA/**

John McKirgan, Chief,  
Spent Fuel Licensing Branch,  
Division of Spent Fuel Management,  
Office of Nuclear Material Safety  
and Safeguards.

SUBJECT: Federal Register Notice: Issuing Exemption to Entergy Nuclear Operations, Inc.  
Vermont Yankee Nuclear Power Station Independent Spent Fuel Storage Installation,  
Document Date: June 6, 2017

**FRN for Entergy/Vermont Yankee Exemption**

**Location:**

**DISTRIBUTION:**

**ADAMS Accession No.: ML17143A156**

<b>OFC</b>	NMSS/DSFM	NMSS/DSFM	ADM	OGC	NMSS/DSFM
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<b>DATE</b>	2/22/2017	2/23/2017	2/27/2017	5/25/2017	6/6/17

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