



NUCLEAR REGULATORY COMMISSION

[Docket No. 50-255; NRC-2023-0200]

Holtec Decommissioning International, LLC, and Holtec Palisades, LLC; Palisades Nuclear Plant; Exemption

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice; issuance.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) has issued an exemption in response to a request from Holtec Decommissioning International, LLC (HDI), an indirect wholly owned subsidiary of Holtec International, that would allow HDI and Holtec Palisades, LLC, regarding certain emergency planning (EP) requirements. The exemption eliminates the requirements to maintain an offsite radiological emergency preparedness plan and reduce the scope of onsite EP activities at the Palisades Nuclear Plant, based on the reduced risks of accidents that could result in an offsite radiological release at a decommissioning nuclear power reactor.

DATES: The exemption was issued on December 22, 2023.

ADDRESSES: Please refer to Docket ID **NRC-2023-0200** 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 Website:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2023-0200**. Address questions about Docket IDs in Regulations.gov to Stacy Schumann; telephone: 301-415-0624; email: Stacy.Schumann@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 <https://www.nrc.gov/reading-rm/adams.html>. To begin the search, 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, at 301-415-4737, or by email to 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:** The PDR, where you may examine and order copies of publicly available documents, is open by appointment. To make an appointment to visit the PDR, please send an email to PDR.Resource@nrc.gov or call 1-800-397-4209 or 301-415-4737, between 8 a.m. and 4 p.m. eastern time (ET), Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Tanya E. Hood, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-1387; email: Tanya.Hood@nrc.gov.

SUPPLEMENTARY INFORMATION: The text of the exemption is attached.

Dated: December 27, 2023.

For the Nuclear Regulatory Commission.

Tanya E. Hood,
*Project Manager,
Reactor Decommissioning Branch,
Division of Decommissioning, Uranium
Recovery and Waste Programs,
Office of Nuclear Material Safety
and Safeguards.*

Attachment – Exemption

NUCLEAR REGULATORY COMMISSION

Docket No. 50-255

Holtec Decommissioning International, LLC,

and Holtec Palisades, LLC;

Palisades Nuclear Plant

Exemption

I. Background

By letter dated October 19, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17292A032), Entergy Nuclear Operations, Inc. (ENOI) certified to the U.S. Nuclear Regulatory Commission (NRC, or Commission) that it planned to permanently cease power operations at the Palisades Nuclear Plant (Palisades) no later than May 31, 2022. On May 20, 2022, ENOI permanently ceased power operations at Palisades, and by letter dated June 13, 2022 (ML22164A067), ENOI certified to the NRC that the fuel was permanently removed from the Palisades reactor vessel and placed in the spent fuel pool (SFP) on June 10, 2022.

By application dated December 23, 2020 (ML20358A075), as supplemented by information provided in letters from Holtec Decommissioning International, LLC (HDI, the licensee) dated December 23, 2020, and October 29, 2021 (ML20358A232, ML20358A239, and ML21302A064), ENOI, Entergy Nuclear Palisades, LLC, Holtec International, and HDI submitted an “Application for Order Consenting to Transfers of Control of Licenses and Approving Conforming License Amendments” requesting transfer of the Palisades license to HDI. By letter dated December 13, 2021 (ML21292A145), the NRC issued an order consenting to the license transfer and draft conforming administrative license amendments. The license transfer was executed on June 28, 2022 (ML22173A173), coinciding with the transition of Palisades from an

operational to a decommissioning status.

Based on the docketing of the certifications for permanent cessation of operations and permanent removal of fuel from the reactor vessel, as specified in section 50.82(a)(2) of title 10 of the *Code of Federal Regulations* (10 CFR), the 10 CFR part 50 renewed facility operating license for Palisades no longer authorizes operation of the reactor or emplacement or retention of fuel in the reactor vessel. The facility is still authorized to possess and store irradiated (i.e., spent) nuclear fuel. Palisades spent fuel is currently stored in the SFP and in dry cask storage at the independent spent fuel storage installation (ISFSI).

Many of the accident scenarios postulated in the updated safety analysis reports (USARs) for operating nuclear power reactors involve failures or malfunctions of systems, which could affect the fuel in the reactor core and, in the most severe postulated accidents, would involve the release of some fission products. With the permanent cessation of power operations at Palisades and the permanent removal of fuel from the reactor vessel, many accidents are no longer possible. The reactor, reactor coolant system, and supporting systems are no longer in operation and have no function related to the storage of the spent fuel. Therefore, the emergency planning (EP) provisions for postulated accidents involving failure or malfunction of the reactor, reactor coolant system, or supporting systems are no longer applicable.

The EP requirements of 10 CFR 50.47, "Emergency plans," and appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR part 50 continue to apply to nuclear power reactors that have provided certification that they have permanently ceased operations and have permanently removed all fuel from the reactor vessel. There are no explicit regulatory provisions distinguishing EP requirements for a power reactor that is permanently shut down and defueled from those for a reactor that is authorized to operate. To reduce or eliminate EP requirements that are no longer necessary due to the decommissioning status of the facility, the licensee must obtain exemptions from those EP regulations. Only then can

HDI modify the Palisades emergency plan to reflect the reduced risk associated with the permanently shutdown and defueled condition of Palisades.

II. Request/Action

By letter dated July 11, 2022 (ML22192A134), HDI requested exemptions from specific portions of the EP requirements of 10 CFR 50.47 and appendix E to 10 CFR part 50 for Palisades. More specifically, HDI requested exemptions from certain planning standards in 10 CFR 50.47(b) regarding onsite and offsite radiological emergency preparedness plans for nuclear power reactors; from certain requirements in 10 CFR 50.47(c)(2) for establishment of plume exposure pathway and ingestion pathway emergency planning zones (EPZs) for nuclear power reactors; and from certain requirements in 10 CFR part 50, appendix E, section IV, "Content of Emergency Plans."

The exemptions requested by HDI would eliminate the requirements to maintain formal offsite radiological emergency plans, reviewed by the Federal Emergency Management Agency (FEMA) under the requirements of 44 CFR, "Emergency Management and Assistance," Part 350, "Review and Approval of State and Local Radiological Emergency Plans and Preparedness," and would reduce the scope of the onsite EP activities at Palisades. HDI stated that application of all the standards and requirements in 10 CFR 50.47(b), 10 CFR 50.47(c), and 10 CFR part 50, appendix E is not needed for adequate emergency response capability, based on the substantially lower onsite and offsite radiological consequences of accidents still possible at the permanently shutdown and defueled facility as compared to an operating facility.

If offsite protective actions were needed for a highly unlikely beyond design-basis accidents (DBAs) that could challenge the safe storage of spent fuel at Palisades, provisions exist for offsite agencies to take protective actions using a comprehensive emergency management plan (CEMP) under the National Preparedness System to protect the health and safety of the public. A CEMP in this context, also referred to as an emergency operations plan, is addressed in FEMA's Comprehensive Preparedness Guide 101, "Developing and Maintaining Emergency Operations Plans," which is publicly

available at https://www.fema.gov/pdf/about/divisions/npd/CPG_101_V2.pdf.

Comprehensive Preparedness Guide 101 is the foundation for State, territorial, Tribal, and local EP in the United States. It promotes a common understanding of the fundamentals of risk-informed planning and decision-making and helps planners at all levels of government in their efforts to develop and maintain viable, all-hazards, all-threats emergency plans. An emergency operations plan is flexible enough for use in all emergencies. It describes how people and property will be protected; details who is responsible for carrying out specific actions; identifies the personnel, equipment, facilities, supplies and other resources available; and outlines how all actions will be coordinated. A CEMP is often referred to as a synonym for "all-hazards planning."

III. Discussion

In accordance with 10 CFR 50.12, "Specific exemptions," the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR part 50 when: (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) any of the special circumstances listed in 10 CFR 50.12(a)(2) are present. These special circumstances include, among other things, that the application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.

As noted previously, the EP regulations contained in 10 CFR 50.47(b) and appendix E to 10 CFR part 50 apply to both operating and shutdown power reactors. The NRC has consistently acknowledged that the risk of an offsite radiological release at a power reactor that has permanently ceased operations and permanently removed fuel from the reactor vessel is significantly lower, and the types of possible accidents are significantly fewer, than at an operating power reactor. However, current EP regulations do not recognize that once a power reactor permanently ceases operation, the risk of a large radiological release from a credible emergency accident scenario is reduced. Due

to the permanently defueled status of the reactor, no new spent fuel will be added to the Palisades SFP and the radionuclides in the current spent fuel will continue to decay as the spent fuel ages. The spent fuel will produce less heat due to radioactive decay, increasing the available time to mitigate a loss of water inventory from the SFP. The NRC's NUREG/CR-6451, "A Safety and Regulatory Assessment of Generic BWR [Boiling Water Reactor] and PWR [Pressurized Water Reactor] Permanently Shutdown Nuclear Power Plants," dated August 1997 (ML082260098), and the NRC's NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," dated February 2001 (ML010430066), confirmed that for permanently shutdown and defueled power reactors that are bounded by the assumptions and conditions in the report, the risk of offsite radiological release is significantly less than for an operating nuclear power reactor.

In the past, EP exemptions similar to those requested by HDI, have been granted to licensees of permanently shutdown and defueled power reactors. However, the exemptions did not relieve the licensees of all EP requirements. Rather, the exemptions allowed the licensees to modify their emergency plans commensurate with the credible site-specific risks that were consistent with a permanently shutdown and defueled status. Specifically, the NRC's approval of these prior exemptions from certain EP requirements was based on the licensee's demonstration that: (1) the radiological consequences of DBAs would not exceed the limits of the U.S. Environmental Protection Agency's (EPA) Protective Action Guidelines (PAGs) at the exclusion area boundary, and (2) in the highly unlikely event of a beyond DBA resulting in a loss of all modes of cooling for the spent fuel stored in the SFP, there is sufficient time to initiate appropriate mitigating actions, and if needed, for offsite authorities to implement offsite protective actions using a CEMP approach to protect the health and safety of the public. In prior exemptions, sufficient time was demonstrated if the time exceeded 10 hours from the loss of coolant until the fuel temperature would be expected to reach 900 degrees Celsius (°C), assuming no air cooling. In this exemption request, the licensee provided an analysis

demonstrating that after the spent fuel has decayed for 12 months, for beyond-design-basis events where the SFP is drained and air cooling is not possible, at least 10 hours would be available from the time spent fuel cooling is lost until the hottest fuel assembly reaches a temperature of 900°C. This 10-hour minimum threshold provides sufficient time for the licensee to take mitigative actions, or if government officials deem warranted, for offsite protective actions to be initiated using a CEMP or “all-hazards” approach.

The NRC staff reviewed the licensee's justification for the requested exemptions against the criteria in 10 CFR 50.12(a) and determined, as described below, that the criteria in 10 CFR 50.12(a) are met, and that the exemptions should be granted. An assessment of the HDI EP exemptions is described in SECY-23-0043, “Request by Holtec Decommissioning International, LLC for Exemptions from Certain Emergency Planning Requirements for Palisades Nuclear Plant,” dated May 30, 2023 (ML23054A179). The Commission approved the NRC staff's recommendation to grant the exemptions in the staff requirements memorandum to SECY-23-0043, dated December 7, 2023 (ML23341A181). The exemptions are conditioned to make it clear that the exemptions will terminate if the status of the Palisades reactor changes such that the certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel are no longer applicable. Descriptions of the specific exemptions requested by HDI and the NRC staff's basis for granting each exemption are provided in SECY-23-0043. The staff's detailed review and technical basis for the approval of the specific EP exemptions, requested by HDI, are provided in the NRC staff's safety evaluation dated December 22, 2023 (ML23263A977).

A. The Exemption is Authorized by Law.

The licensee has proposed exemptions from certain EP requirements in 10 CFR 50.47(b), 10 CFR 50.47(c)(2), and 10 CFR part 50, appendix E, section IV, which would allow HDI to revise the Palisades Emergency Plan to reflect the submittal of the certification of the permanently shutdown and defueled condition of the facility. As

stated above, in accordance with 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR part 50. The NRC staff has determined that granting of the licensee's proposed exemptions will not result in a violation of the Atomic Energy Act of 1954, as amended, or the NRC's regulations. Therefore, the exemptions are authorized by law.

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

As stated previously, HDI provided analyses that show the radiological consequences of DBA will not exceed the limits of the EPA PAGs at the exclusion area boundary. Therefore, formal offsite radiological emergency plans required under 10 CFR part 50 are no longer needed for protection of the public beyond the exclusion area boundary, based on the radiological consequences of DBAs still possible at Palisades.

Although highly unlikely, there is one postulated beyond DBA that might result in significant offsite radiological releases. However, NUREG-1738 confirms that the risk of beyond DBAs is greatly reduced at permanently shutdown and defueled reactors. The NRC staff's analyses in NUREG-1738 concludes that the event sequences important to risk at permanently shutdown and defueled power reactors are limited to large earthquakes and cask drop events. For EP assessments, this is an important difference relative to the operating power reactors, where typically a large number of different sequences make significant contributions to risk. As described in NUREG-1738, relaxation of offsite EP requirements in 10 CFR part 50 a few months after shutdown resulted in only a small change in risk. The report further concludes that the change in risk due to relaxation of offsite EP requirements is small because the overall risk is low, and because even under current EP requirements for operating power reactors, EP was judged to have marginal impact on evacuation effectiveness in the severe earthquake event that dominates SFP risk. All other sequences including cask drops (for which offsite radiological emergency plans are expected to be more effective) are too low in likelihood to have a significant impact on risk. Therefore, granting exemptions to

eliminate the requirements of 10 CFR part 50 to maintain offsite radiological emergency preparedness plans and to reduce the scope of onsite EP activities will not present an undue risk to the public health and safety.

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

The requested exemptions by HDI only involve EP requirements under 10 CFR part 50 and will allow HDI to revise the Palisades Emergency Plan to reflect the permanently shutdown and defueled condition of the facility. Physical security measures at Palisades are not affected by the requested EP exemptions. The discontinuation of formal offsite radiological emergency preparedness plans and the reduction in scope of the onsite EP activities at Palisades will not adversely affect the licensee's ability to physically secure the site or protect special nuclear material. Therefore, the proposed exemptions are consistent with common defense and security.

D. Special Circumstances.

Special circumstances, in accordance with 10 CFR 50.12(a)(2)(ii), are present whenever application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. The underlying purpose of 10 CFR 50.47(b), 10 CFR 50.47(c)(2), and 10 CFR part 50, appendix E, section IV, is to provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency, to establish plume exposure and ingestion pathway emergency planning zones for nuclear power plants, and to ensure that licensees maintain effective offsite and onsite radiological emergency preparedness plans. The standards and requirements in these regulations were developed by considering the risks associated with operation of a nuclear power reactor at its licensed full-power level. These risks include the potential for a reactor accident with offsite radiological dose consequences.

As discussed previously in Section III, because Palisades is permanently shut down and defueled, there is no longer a risk of offsite radiological release from a DBA and the risk of a significant offsite radiological release from a beyond DBA is greatly

reduced when compared to the risk at an operating power reactor. The NRC staff has confirmed the reduced risks at Palisades by comparing the generic risk assumptions in the analyses in NUREG-1738 to site-specific conditions at Palisades and determined that the risk values in NUREG-1738 bound the risks presented for Palisades. As indicated by the results of the research conducted for NUREG-1738, and more recently for NUREG-2161, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor," dated September 2014 (ML14255A365), while other consequences can be extensive, accidents from SFPs with significant decay time have little potential to cause offsite early fatalities, even if the formal offsite radiological EP requirements were relaxed. HDI's analysis of a beyond DBA involving a complete loss of SFP water inventory, based on an adiabatic heatup analysis of the limiting fuel assembly for decay heat, shows that 12 months after permanent cessation of power operations at Palisades, the time for the limiting fuel assembly to reach 900 °C is at least 10 hours after the assemblies have been uncovered assuming a loss of all cooling means.

The NRC staff has verified the licensee's analyses and its calculations. The analyses provide reasonable assurance that in granting the requested exemptions to HDI, there is no DBA that will result in an offsite radiological release exceeding the EPA PAGs at the exclusion area boundary. In the highly unlikely event of a beyond DBA affecting the SFP that results in a complete loss of heat removal via all modes of heat transfer, there will be a minimum of 10 hours available before an offsite release might occur and, therefore, at least 10 hours to initiate appropriate mitigating actions to restore a means of heat removal to the spent fuel. If a radiological release were projected to occur under this highly unlikely scenario, a minimum of 10 hours is considered sufficient time for offsite authorities to implement protective actions using a CEMP approach to protect the health and safety of the public.

Exemptions from the offsite EP requirements in 10 CFR part 50 have previously been approved by the NRC when the site-specific analyses show that at least 10 hours

is available following a loss of SFP coolant inventory with no air cooling (or other methods of removing decay heat) until cladding of the hottest fuel assembly reaches the rapid oxidation temperature. The NRC staff concluded in its previously granted exemptions, as it does with the licensee's requested EP exemptions, that if a minimum of 10 hours is available to initiate mitigative actions consistent with plant conditions or, if needed, for offsite authorities to implement protective actions using a CEMP approach, then formal offsite radiological emergency preparedness plans, required under 10 CFR part 50, are not necessary at permanently shutdown and defueled facilities.

Additionally, in its letter to the NRC dated July 11, 2022, HDI described the SFP makeup strategies that could be used in the event of a catastrophic loss of SFP inventory. The multiple strategies for providing makeup water to the SFP include: using various existing plant systems for inventory makeup and an internal strategy that relies on the portable FLEX pump manifold, and having available two installed diesel-driven fire pumps and one motor-driven fire pump that can provide 1,500 gallons per minute makeup water from the facility intake via hard pipe or hose stations. In addition, HDI states that two onsite FLEX pumper units with a capacity of 1,000 gallons per minute each can provide makeup water from the facility intake or from Lake Michigan directly. Further, Palisades procedures specify that the installation of the SFP spray monitor nozzles and direct fill should be given priority over the hard pipe fill connection due to expected SFP area high radiation levels if the SFP water level cannot be maintained. These strategies will continue to be required as License Condition 6.b of Renewed Facility License No. DPR-20 for Palisades. Considering the very low probability of beyond DBAs affecting the SFP, these diverse strategies provide multiple methods to obtain additional makeup or spray to the SFP before the onset of any postulated offsite radiological release.

For all of the reasons stated above, the NRC staff finds that the licensee's requested exemptions meet the underlying purpose of all of the standards in 10 CFR 50.47(b), as well as the requirements in 10 CFR 50.47(c)(2) and 10 CFR

part 50, appendix E, and satisfy the special circumstances provision in 10 CFR 50.12(a)(2)(ii) in view of the greatly reduced risk of offsite radiological consequences associated with the permanently shutdown and defueled state of the Palisades facility 12 months after the facility permanently ceases operation.

The NRC staff further concludes that the exemptions granted by this action will maintain an acceptable level of emergency preparedness at Palisades and provide reasonable assurance that adequate offsite protective measures, if needed, can and will be taken by State and local government agencies using a CEMP approach, in the highly unlikely event of a radiological emergency at Palisades. Since the underlying purposes of the rules, as exempted, would continue to be achieved, even with the elimination of the requirements under 10 CFR part 50 to maintain formal offsite radiological emergency plans and the reduction in the scope of the onsite EP activities at Palisades, the special circumstances required by 10 CFR 50.12(a)(2)(ii) exist.

E. Environmental Considerations.

In accordance with 10 CFR 51.31(a), the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment as discussed in the NRC staff's Environmental Assessment and Finding of No Significant Impact published in the *Federal Register* (FR) on December 21, 2023 (88 FR 88664).

IV. Conclusions

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, the licensee's request for exemptions from certain EP requirements in 10 CFR 50.47(b), 10 CFR 50.47(c)(2), and 10 CFR part 50, appendix E, section IV, and as summarized in Enclosure 2 to SECY-23-0043, are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security. Also, special circumstances are present. Therefore, the Commission hereby grants HDI exemptions from certain EP requirements in 10 CFR 50.47(b), 10 CFR 50.47(c)(2), and 10 CFR part 50, appendix E, section IV, as discussed and evaluated in detail in the NRC

staff's safety evaluation dated December 22, 2023. The exemptions are effective 12 months after permanent cessation of power operations, which was May 20, 2023. Because this period had already elapsed, the exemption is effective upon issuance. These exemptions will terminate if the status of the Palisades reactor changes such that the certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel are no longer applicable.

Dated: this 22nd day of December 2023.

For the Nuclear Regulatory Commission.

/RA/

Jane Marshall, Director,
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and Safeguards.

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