



NUCLEAR REGULATORY COMMISSION

[Docket No. 50-255; NRC-2023-0193]

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, to reduce the minimum coverage limit for onsite property damage insurance from \$1.06 billion to \$50 million for the Palisades Nuclear Plant.

DATES: The exemption was issued on December 21, 2023.

ADDRESSES: Please refer to Docket ID **NRC-2023-0193** 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-2023-0193**. 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 e-mail 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 28, 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.*

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 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. Accordingly, pursuant to paragraphs 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).

II. Request/Action.

By letter dated October 26, 2022 (ML22299A062), Holtec Decommissioning International, LLC (HDI), one of the licensees of Palisades and an indirect wholly owned subsidiary of Holtec International (Holtec), requested an exemption on behalf of Holtec Palisades, LLC, the other Palisades licensee, from 10 CFR 50.54(w)(1) concerning

onsite liability insurance. HDI and Holtec Palisades, LLC, are hereafter collectively referred to as the licensee. The exemption from 10 CFR 50.54(w)(1) would permit the licensee to reduce the required level of onsite property damage insurance from \$1.06 billion to \$50 million for Palisades.

The regulation at 10 CFR 50.54(w)(1) requires licensees to have and maintain onsite property damage insurance to stabilize and decontaminate the reactor and reactor site in the event of an accident. The onsite insurance coverage must be either \$1.06 billion or whatever amount of insurance is generally available from private sources (whichever is less).

The licensee states that the risk of an incident at a permanently shutdown and defueled reactor is much less than the risk from an operating power reactor. In addition, since reactor operation is no longer authorized at Palisades, there are no events that would require the stabilization of reactor conditions after an accident. Similarly, the risk of an accident that would result in significant onsite contamination at Palisades is also much lower than the risk of such an event at operating reactors. Therefore, the licensee requested an exemption from 10 CFR 50.54(w)(1) to reduce its onsite property damage insurance from \$1.06 billion to \$50 million, commensurate with the reduced risk of an incident at the permanently shutdown and defueled Palisades site.

III. Discussion.

Under 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 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.

The financial protection limits of 10 CFR 50.54(w)(1) were established after the Three Mile Island Nuclear Station, Unit 2 accident out of concern that licensees may be unable to financially cover onsite cleanup costs in the event of a major nuclear accident.

The specified \$1.06 billion coverage amount requirement was developed based on an analysis of an accident at a nuclear reactor operating at power, resulting in a large fission product release and requiring significant resource expenditures to stabilize the reactor and ultimately decontaminate and cleanup the site.

These cost estimates were developed based on the spectrum of postulated accidents for an operating nuclear reactor. Those costs were derived from the consequences of a release of radioactive material from the reactor. Although the risk of an accident at an operating reactor is very low, the consequences onsite and offsite can be significant. In an operating plant, the high temperature and pressure of the reactor coolant system (RCS) and the inventory of relatively short-lived radionuclides contribute to both the risk and consequences of an accident. With the permanent cessation of reactor operations at Palisades and the permanent removal of the fuel from the reactor vessel, such accidents are no longer possible. As a result, the reactor vessel, RCS, and supporting systems no longer operate and have no function related to the storage of the irradiated fuel. Therefore, postulated accidents involving failure or malfunction of the reactor, RCS, or supporting systems are no longer applicable.

During reactor decommissioning, the largest radiological risks are associated with the storage of spent fuel onsite. In the exemption request dated October 26, 2022, the licensee discussed both design-basis and beyond design-basis events involving irradiated fuel stored in the SFP. The licensee determined that there are no possible design-basis events at Palisades that could result in an offsite radiological release exceeding the limits established by the U.S. Environmental Protection Agency's (EPA) early phase Protective Action Guides (PAGs) of 1 roentgen equivalent man (rem) at the exclusion area boundary, as a way to demonstrate that any possible radiological releases would be minimal and would not require precautionary protective actions (e.g., sheltering in place or evacuation).

The NRC staff evaluated the radiological consequences associated with various decommissioning activities and the design-basis accidents (DBAs) at Palisades in

consideration of a permanently shutdown and defueled condition. The possible DBA scenarios at Palisades have greatly reduced radiological consequences. Based on its review, the NRC staff concluded that no reasonably conceivable DBA exists that could cause an offsite release greater than the EPA PAGs.

The only incident that has the potential to lead to a significant radiological release at a decommissioning reactor is a zirconium fire. The zirconium fire scenario is a postulated, but highly unlikely, beyond DBA scenario that involves loss of water inventory from the SFP resulting in a significant heatup of the spent fuel and culminating in substantial zirconium cladding oxidation and fuel damage. The probability of a zirconium fire scenario is related to the decay heat of the irradiated fuel stored in the SFP. Therefore, the risks from a zirconium fire scenario continue to decrease as a function of the time since Palisades has been permanently shutdown.

The Commission has previously authorized a lesser amount of onsite financial protection based on this analysis of the zirconium fire risk. In SECY-96-256, "Changes to Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors, 10 CFR 50.54(w) and 10 CFR 140.11," dated December 17, 1996 (ML15062A483), the NRC staff recommended changes to the power reactor financial protection regulations that would allow licensees to lower onsite insurance levels to \$50 million upon demonstration that the fuel stored in the SFP can be air-cooled. In its Staff Requirements Memorandum to SECY-96-256, dated January 28, 1997 (ML15062A454), the Commission supported the NRC staff's recommendation that, among other things, would allow permanently shutdown power reactor licensees to reduce commercial onsite property damage insurance coverage to \$50 million when the licensee was able to demonstrate the technical criterion that the spent fuel could be air-cooled if the SFP was drained of water.

The NRC staff has used this technical criterion to grant similar exemptions to other decommissioning reactors (e.g., Pilgrim Nuclear Power Station, published in the *Federal Register* on January 14, 2020 (85 FR 2153); Three Mile Island Nuclear Station,

Unit 1, published in the *Federal Register* on March 26, 2021 (86 FR 16241); and Duane Arnold Energy Center, published in the *Federal Register* on May 18, 2021 (86 FR 26946)). These prior exemptions were based on these licensees demonstrating that the SFP could be air-cooled, consistent with the technical criterion discussed above.

In its October 26, 2022 request, the licensee compared Palisades fuel storage parameters with those used in NRC generic evaluations of fuel cooling included in 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). The analysis described in NUREG/CR-6451 determined that natural air circulation would adequately cool fuel that has decayed for 17 months after operation in a typical PWR. The licensee compared the post-shutdown fuel storage conditions with those assumed for the analysis presented in NUREG/CR-6451.

In SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning," dated June 28, 2000, and SECY-01-0100, "Policy Issues Related to Safeguards, Insurance, and Emergency Preparedness Regulations at Decommissioning Nuclear Power Plants Storing Fuel in Spent Fuel Pools," dated June 4, 2001 (ML003721626 and ML011450420, respectively), the NRC staff discussed additional information concerning SFP zirconium fire risks at decommissioning reactors and associated implications for onsite property damage insurance. Providing an analysis of when the spent fuel stored in the SFP is capable of air-cooling is one measure that can be used to demonstrate that the probability of a zirconium fire is exceedingly low. However, the NRC staff has more recently used an additional analysis that bounds an incomplete drain down of the SFP water, or some other catastrophic event (such as a complete drainage of the SFP with rearrangement of spent fuel rack geometry and/or the addition of rubble to the SFP). The analysis postulates that decay heat transfer from the spent fuel via conduction, convection, or radiation would be impeded. This analysis is often referred to as an adiabatic heatup.

In its exemption dated October 26, 2022, the licensee stated, and the NRC staff confirmed, that the bounding analyses for the Palisades SFP for beyond design basis events demonstrate that 12 months after shutdown of Palisades a minimum of 10 hours is available before the fuel cladding temperature of the hottest fuel assembly in the SFP reaches 900°C with a complete loss of SFP water inventory. This analysis, “Holtec Spent Fuel Pool Calculations,” dated July 8, 2022, [non-public] was submitted as Attachment 1 by the licensee in support of the letter dated July 11, 2022 (ML22192A134), in which the licensee requested exemptions from specific portions of 10 CFR 50.47 and appendix E to 10 CFR part 50 for the Palisades license.

As stated in NUREG-1738, “Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants,” dated February 2001 (ML010430066), 900°C is an acceptable temperature to use for assessing the onset of fission product release, 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. The 10-hour criterion, conservatively, does not consider the time to uncover the fuel and assumes instantaneous loss of cooling to the fuel. The 10-hour time period is also not intended to represent the time that it would take to repair all key safety systems or to repair a large SFP breach. The 10-hour criterion is a conservative period of time in which pre-planned mitigation measures to provide makeup water or spray to the SFP can be reliably implemented before the onset of a zirconium cladding ignition. In addition, in the unlikely event that a release is projected to occur, 10 hours would provide sufficient time for offsite agencies, if deemed warranted, to take appropriate action to protect the health and safety of the public.

In the NRC staff’s evaluation contained in SECY-23-0043, “Request by Holtec Decommissioning International, LLC for Exemptions from Certain Emergency Planning Requirements for Palisades Nuclear Plant,” dated May 15, 2023 (ML23054A179), the NRC staff assessed the licensee’s accident analyses associated with the radiological risks from a zirconium fire at a permanently shutdown and defueled Palisades after 12

months of fuel decay. For the highly unlikely beyond design-basis accident scenario where the SFP coolant inventory is lost in such a manner that all methods of heat removal from the spent fuel are no longer available, the NRC staff found that there will be a minimum of 10 hours from the initiation of the accident until the cladding reaches a temperature where offsite radiological release might occur. The NRC staff finds that 10 hours is sufficient time to support deployment of mitigation equipment, consistent with plant conditions, to prevent the zirconium cladding from reaching a point of rapid oxidation. As a result, the likelihood that such a scenario would progress to a zirconium fire is deemed not credible.

However, the NRC staff has postulated that there is still a potential for other radiological incidents at a decommissioning reactor that could result in significant onsite contamination besides a zirconium fire. In SECY-96-256, the NRC staff cited the rupture of a large, contaminated liquid storage tank (~450,000 gallons) causing soil contamination and potential groundwater contamination as the costliest postulated event to decontaminate and remediate (other than an SFP zirconium fire). The postulated large liquid radiological waste storage tank rupture event was determined to have a bounding onsite cleanup cost of approximately \$50 million. Therefore, the NRC staff determined that the licensee's proposal to reduce onsite insurance to a level of \$50 million would be consistent with the bounding cleanup and decontamination cost, as discussed in SECY-96-256, to account for the postulated rupture of a large liquid radiological waste tank at the Palisades site, should such an event occur.

The NRC staff has determined that the licensee's proposed reduction in onsite property damage insurance coverage to a level of \$50 million is consistent with SECY-96-256 and subsequent insurance considerations resulting from additional zirconium fire risks as discussed in SECY-00-0145 and SECY-01-0100, as well as NUREG/CR-6451 and NUREG-1738. In addition, the NRC staff notes that similar exemptions have been granted to other permanently shutdown and defueled power

reactors, upon demonstration that the criterion of the zirconium fire risks from the irradiated fuel stored in the SFP is of negligible concern.

A. The Exemption is Authorized by Law

The requested exemption from 10 CFR 50.54(w)(1) would allow the licensee to reduce the minimum coverage limit for onsite property damage insurance. As stated above, 10 CFR 50.12 allows the NRC to grant exemptions from the requirements of 10 CFR part 50 when the exemptions are authorized by law.

As explained above, the NRC staff has determined that the licensee's proposed reduction in onsite property damage insurance coverage to a level of \$50 million is consistent with SECY-96-256. Moreover, the NRC staff concluded that 12 months after the permanent cessation of power operations, sufficient irradiated fuel decay time will have elapsed at Palisades to decrease the probability of an onsite and offsite radiological release from a postulated zirconium fire accident to negligible levels. In addition, the licensee's proposal to reduce onsite insurance to a level of \$50 million is consistent with the maximum estimated cleanup costs for the recovery from the rupture of a large liquid radiological waste storage tank.

The NRC staff has determined that granting the licensee's proposed exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, based on its review of the licensee's exemption request as discussed above, and consistent with SECY-96-256, the NRC staff concludes that the exemption is authorized by law.

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

The onsite property damage insurance requirements of 10 CFR 50.54(w)(1) were established to provide financial assurance that following a significant nuclear incident, onsite conditions could be stabilized and the site decontaminated. The requirements of 10 CFR 50.54(w)(1) and the existing level of onsite insurance coverage for Palisades are predicated on the assumption that the reactor is operating. However, Palisades was permanently shut down on May 20, 2022, and defueled on June 10, 2022. The

permanently shutdown and defueled status of the facility results in a significant reduction in the number and severity of potential accidents and, correspondingly, a significant reduction in the potential for and severity of onsite property damage. The proposed reduction in the amount of onsite insurance coverage does not impact the probability or consequences of potential accidents. The proposed level of insurance coverage is commensurate with the reduced consequences of potential nuclear accidents at Palisades. Therefore, the NRC staff concludes that granting the requested exemption will not present an undue risk to the health and safety of the public.

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

The proposed exemption would not eliminate any requirements associated with physical protection of the site and would not adversely affect the licensee's ability to physically secure the site or protect special nuclear material. Physical security measures at Palisades are not affected by the requested exemption. Therefore, the proposed exemption is consistent with the 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 regulation. The underlying purpose of 10 CFR 50.54(w)(1) is to provide reasonable assurance that adequate funds will be available to stabilize reactor conditions and cover onsite cleanup costs associated with site decontamination following an accident that results in the release of a significant amount of radiological material. Since Palisades permanently shut down on May 20, 2022, and defueled on June 10, 2022, it is no longer possible for the radiological consequences of DBAs or other credible events at Palisades to exceed the limits of the EPA PAGs at the exclusion area boundary.

The licensee has evaluated the consequences of highly unlikely, beyond-design-basis conditions involving a loss of inventory from the SFP. The analyses show that 12 months after the permanent cessation of power operations on May 20, 2022, the likelihood of such an event leading to a large radiological release is negligible. The NRC staff's evaluation of the licensee's analyses confirms this conclusion.

The NRC staff also finds that the licensee's proposed \$50 million level of onsite insurance is consistent with the bounding cleanup and decontamination cost as discussed in SECY-96-256 to account for the hypothetical rupture of a large liquid radiological waste tank at the Palisades site should such an event occur. Therefore, the NRC staff concludes that the application of the current requirements in 10 CFR 50.54(w)(1) to maintain \$1.06 billion in onsite insurance coverage is not necessary to achieve the underlying purpose of the rule for the permanently shutdown and defueled Palisades reactor.

Under 10 CFR 50.12(a)(2)(iii), special circumstances are present whenever compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated.

The NRC staff concludes that if the licensee was required to continue to maintain an onsite insurance level of \$1.06 billion, the associated insurance premiums would be in excess of those necessary and commensurate with the radiological contamination risks posed by the site. In addition, such insurance levels would be significantly in excess of other decommissioning reactor facilities that have been granted similar exemptions by the NRC.

The NRC staff finds that compliance with the existing rule would result in an undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted and are significantly in excess of those incurred by others similarly situated. Therefore, the special circumstances required by 10 CFR 50.12(a)(2)(ii) and 10 CFR 50.12(a)(2)(iii) exist.

E. Environmental Considerations

The NRC's approval of an exemption from insurance or indemnity requirements belongs to a category of actions that the Commission, by rule or regulation, has declared to be a categorical exclusion after first finding that the category of actions does not individually or cumulatively have a significant effect on the human environment. Specifically, the exemption is categorically excluded from the requirement to prepare an environmental assessment or environmental impact statement in accordance with 10 CFR 51.22(c)(25).

Under 10 CFR 51.22(c)(25), granting of an exemption from the requirements of any regulation of Chapter I to 10 CFR is a categorical exclusion provided that: (i) there is no significant hazards consideration; (ii) there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite; (iii) there is no significant increase in individual or cumulative public or occupational radiation exposure; (iv) there is no significant construction impact; (v) there is no significant increase in the potential for or consequences from radiological accidents; and (vi) the requirements from which an exemption is sought involve surety, insurance, or indemnity requirements.

As the Director of the Division of Decommissioning, Uranium Recovery, and Waste Programs in the NRC's Office of Nuclear Material Safety and Safeguards, I have determined that approval of the exemption request involves no significant hazards consideration, as defined in 10 CFR 50.92, because reducing the licensee's onsite property damage insurance for Palisades does not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. The exempted financial protection regulation is unrelated to the operation of Palisades or site activities. Accordingly, there is no significant change in the types or significant increase in the

amounts of any effluents that may be released offsite and no significant increase in individual or cumulative public or occupational radiation exposure. The exempted regulation is not associated with construction so there is no significant construction impact. The exempted regulation does not concern the source term (i.e., potential amount of radiation in an accident) nor any activities conducted at the site. Therefore, there is no significant increase in the potential for, or consequences of, a radiological accident. In addition, there would be no significant impacts to biota, water resources, historic properties, cultural resources, or socioeconomic conditions in the region resulting from issuance of the requested exemption. The requirement for onsite property damage insurance involves surety, insurance, and indemnity matters only.

Therefore, pursuant to 10 CFR 51.22(b) and 51.22(c)(25), no environmental impact statement or environmental assessment need be prepared in connection with the approval of this exemption request.

IV. Conclusions.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Also, special circumstances are present as set forth in 10 CFR 50.12.

Therefore, the Commission hereby grants Holtec Palisades and HDI an exemption from the requirements of 10 CFR 50.54(w)(1) for Palisades. Palisades permanently ceased power operations on May 20, 2022. The exemption permits Palisades to lower the minimum required onsite insurance to \$50 million 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.

Dated this 21st day of December, 2023.

For the Nuclear Regulatory Commission.

/RA/

Jane Marshall, Director,
Division of Decommissioning, Uranium
Recovery, and Waste Programs,
Office of Nuclear Material Safety
and Safeguards.

[FR Doc. 2023-28909 Filed: 1/2/2024 8:45 am; Publication Date: 1/3/2024]