



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

December 22, 2023

Jean A. Fleming
Vice President, Licensing,
Regulatory Affairs, and PSA
Holtec International, LLC
Krishna P. Singh Technology Campus
1 Holtec Boulevard
Camden, NJ 08104

SUBJECT: PALISADES NUCLEAR PLANT – EXEMPTION FROM CERTAIN EMERGENCY
PLANNING REQUIREMENTS AND RELATED SAFETY EVALUATION
(EPID L-2022-LLE-0024)

Dear Jean Fleming:

The U.S. Nuclear Regulatory Commission (NRC) has approved the enclosed exemptions from specific requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.47, “Emergency plans,” and Appendix E, “Emergency Planning and Preparedness for Production and Utilization Facilities,” to 10 CFR Part 50, for Holtec Decommissioning International, LLC (HDI), one of the licensees of the Palisades Nuclear Plant (Palisades) and an indirect wholly owned subsidiary of Holtec International (Holtec), on behalf of Holtec Palisades, LLC (Holtec Palisades) the other licensee for the Palisades Nuclear Plant (Palisades). This action is in response to the application for exemptions dated July 11, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22192A134).

The exemptions are provided in Enclosure 1 and the NRC staff's related safety evaluation is provided in Enclosure 2. The exemptions will be forwarded to the Office of the Federal Register for publication.

In accordance with 10 CFR 2.390, “Public inspections, exemptions, requests for withholding,” of the NRC’s “Agency Rules of Practice and Procedure,” a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC’s ADAMS. ADAMS is accessible from the NRC website at <https://www.nrc.gov/reading-rm/adams.html>.

J. Fleming

- 2 -

If you have any questions concerning the above, please contact me at (301) 415-1387 or by e-mail to Tanya.Hood@nrc.gov.

Sincerely,



Signed by Hood, Tanya
on 12/22/23

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

Docket No. 50-255
Renewed Facility Operating
License No. DPR-20

Enclosures:

1. Exemptions
2. Safety Evaluation

cc w/enclosures: Palisades ListServ

SUBJECT: PALISADES NUCLEAR PLANT – EXEMPTION FROM CERTAIN EMERGENCY PLANNING REQUIREMENTS AND RELATED SAFETY EVALUATION (EPID L-2022-LLE-0024)

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ADAMS Accession Nos.:

Ltr ML23263A977; Exemption FRN ML23342A213 *via email

OFFICE	NMSS/DUWP/PM	NMSS/DUWP/PM	NSIR/DPR/RLB/BC	NMSS/REFS/ERLRB/BC
NAME	THood	MDoell	NDiFrancesco (Acting)	TSmith
DATE	09/21/2023	09/27/2023	10/10/2023	09/28/2023
OFFICE	NRR/DSS/SCPB/BC	NRR/DRA/ARCB/BC	NMSS/DUWP/BC	OGC
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DATE	09/29/2023	11/15/2023	12/18/2023	12/12/2023
OFFICE	NMSS/DUWP	NMSS/DUWP/PM		
NAME	JMarshall	THood		
DATE	12/22/2023	12/22/2023		

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ENCLOSURE 1

EXEMPTIONS FROM PORTIONS OF
10 CFR 50.47 AND 10 CFR PART 50, APPENDIX E
HOLTEC DECOMMISSIONING INTERNATIONAL, LLC
HOLTEC PALISADES, LLC
PALISADES NUCLEAR PLANT
DOCKET NOS. 50-255 AND 72-007

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 http://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 ($^{\circ}\text{C}$), 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.



Signed by Marshall, Jane
on 12/22/23

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

ENCLOSURE 2

SAFETY EVALUATION RELATED TO
HOLTEC DECOMMISSIONING INTERNATIONAL, LLC
HOLTEC PALISADES, LLC
PALISADES NUCLEAR PLANT
REQUEST FOR EXEMPTIONS FROM
CERTAIN EMERGENCY PLANNING REQUIREMENTS
DOCKET NOS. 50-255 AND 72-007



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

SAFETY EVALUATION BY
THE OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
RELATED TO REQUEST FOR EXEMPTIONS FROM
PORTIONS OF 10 CFR 50.47 AND 10 CFR PART 50, APPENDIX E
HOLTEC DECOMMISSIONING INTERNATIONAL, LLC
PALISADES NUCLEAR PLANT
DOCKET NO. 50-255

1.0 INTRODUCTION

By letter January 4, 2017 (Reference 1), in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, “Domestic Licensing of Production and Utilization Facilities, sections 50.4(b)(8) and 50.82(a)(1)(i), Entergy Nuclear Operations, Inc. (ENOI), certified to the U.S. Nuclear Regulatory Commission (NRC) that it planned to permanently cease power operations at the Palisades Nuclear Plant (Palisades) on October 1, 2018. By letter dated September 28, 2017 (Reference 2), ENOI updated the timeline stating that it decided to permanently cease power operations at the Palisades in the spring of 2022. By letter dated October 19, 2017 (Reference 3), ENOI again updated its timeline and certified to the NRC that it planned to permanently cease power operations at Palisades no later than May 31, 2022.

By application dated December 23, 2020 (Reference 4), as supplemented by information provided in letters from Holtec Decommissioning International, LLC (HDI, the licensee) dated December 23, 2020, and October 29, 2021 (Reference 5, Reference 6, and Reference 7), ENOI, Entergy Nuclear Palisades, LLC; Holtec International (Holtec), 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, one of the licensees of Palisades and an indirect wholly owned subsidiary of Holtec on behalf of Holtec Palisades, LLC (Holtec Palisades) the other licensee for Palisades (hereinafter collectively referred to as the licensee). By letter dated December 13, 2021 (Reference 8), 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 (Reference 9), coinciding with the transition of Palisades from an operational to a decommissioning status.

Palisades permanently ceased operations on May 20, 2022, and all fuel was removed from the Palisades reactor vessel on June 10, 2022. Pursuant to 10 CFR 50.82(a)(1)(ii), by letter dated June 13, 2022 (Reference 10), the licensee certified to the NRC that the fuel had been permanently removed from the Palisades reactor vessel and placed in the spent fuel pool (SFP). Upon the docketing of the certification, under 10 CFR 50.82(a)(2), the Palisades license no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel. The facility is still authorized the possess and store irradiated (i.e., spent) nuclear fuel.

The spent fuel will be stored in the SFP and in dry cask storage at the onsite independent spent fuel storage installation (ISFSI) until it is shipped offsite.

By letter dated July 11, 2022 (Reference 11), the licensee requested exemptions from portions of 10 CFR 50.47, "Emergency plans," and Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," in 10 CFR Part 50, for Palisades. More specifically, the licensee requested exemptions from certain planning standards in 10 CFR 50.47(b) regarding onsite and offsite radiological emergency preparedness (REP) 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 licensee's requested exemptions would eliminate the requirements to maintain formal offsite¹ REP plans in accordance with 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 emergency preparedness (EP) activities at Palisades, based on the reduced risks of an offsite radiological release at the Palisades facility 12 months after permanent cessation of power operations. The exemptions would maintain the requirements for an onsite radiological emergency plan and would continue to ensure the capability to communicate and coordinate with offsite response authorities. The NRC staff found the application complete and found that the licensee's associated technical justification provides a basis for the Commission's consideration of the requested exemptions.

In accordance with 10 CFR 50.12, "Specific exemptions," the licensee stated that this exemption request: (1) is authorized by law; (2) will not present an undue risk to the public health and safety; (3) is consistent with the common defense and security; and (4) meets the requirement for special circumstances in 10 CFR 50.12(a)(2).

2.0 DISCUSSION

The regulations governing EP for a nuclear power reactor are set forth in 10 CFR 50.47, 10 CFR 50.54(q), (s) and (t), and Appendix E to 10 CFR Part 50. Every nuclear power reactor licensee must establish and maintain emergency plans and preparedness in accordance with these regulations. The EP regulations for a nuclear power reactor include standards for both onsite and offsite emergency response plans. These regulations and the planning basis for EP are based upon an anticipated prompt response to a wide spectrum of events for an operating nuclear power reactor. However, for a nuclear power reactor that is no longer operating and is in decommissioning, the spectrum of accidents that can have significant offsite consequences is greatly reduced. At a decommissioning nuclear power reactor site, the only accident scenario 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 SFP, where preplanned SFP mitigation measures were unsuccessful, generating a significant heat up of the spent fuel to the point where substantial zirconium cladding oxidation and fuel damage can occur.

The amount of decay heat present in irradiated fuel in the SFP is directly related to the amount of time that has passed after the reactor is shutdown. As such, the potential for the conditions

¹ The offsite standards are reproduced in the Federal Emergency Management Agency (FEMA) regulations at 44 CFR 350.5, "Criteria for review and approval of State and local radiological emergency plans and preparedness," and are based on the standards established by the Commission in 10 CFR 50.47.

needed for a zirconium cladding fire to occur continues to decrease as a function of the time since the reactor was permanently shutdown. However, current regulations do not reflect that: (1) considerably more time is available during decommissioning to respond to a postulated spent fuel pool coolant event than is available for many postulated operating power reactor accidents, and (2) comprehensive SFP mitigation measures and on-shift staff to implement these measures remain in place following the permanent cessation of power operations.

Since there are no explicit regulatory provisions distinguishing EP requirements for a nuclear power reactor that has permanently ceased operating from those for an operating nuclear power reactor, licensees transitioning to or already in the decommissioning phase usually seek to establish a level of EP commensurate with the risk of a radiological emergency at a decommissioning site. Exemptions from certain EP requirements are typically requested early in the decommissioning process. The NRC reviews each request on a case-by-case basis and grants exemptions only after conducting a thorough analysis of each request. Historically, given the significant reduction in radiological risk from a decommissioning site, the NRC has approved exemptions from EP requirements based on site-specific evaluations and considering the objectives of the regulations. Between 1987 and 1999, the NRC issued exemptions from certain EP requirements for ten licensees in decommissioning. More recently, exemptions from EP requirements during decommissioning have been granted for the Kewaunee Power Station, Crystal River Unit 3 Nuclear Generating Plant, San Onofre Nuclear Generating Station, Units 2 and 3, Vermont Yankee Nuclear Power Station, Fort Calhoun Station, Oyster Creek Nuclear Generating Station, Pilgrim Nuclear Power Station, the Three Mile Island Nuclear Station, and Duane Arnold Energy Center (References 12, 13, 14, 15, 16, 17, 18, 19 and 20 respectively).

Previously granted exemptions from EP regulations reduced the requirements for decommissioning power reactors to those consistent with these standards:

(1) 10 CFR 50.47(d),² which states the requirements for a license authorizing only fuel loading and low power testing, and (2) 10 CFR 72.32(a),³ which establishes the information required in an emergency plan for an ISFSI. Examples of previously granted exemptions from EP regulations for decommissioning power reactors include: setting the highest emergency classification level as an “Alert”; extending the timing requirements for notification of offsite authorities; requiring only onsite exercises with the opportunity for offsite response organization (ORO) participation; and only maintaining arrangements for OROs (i.e., law enforcement, fire and medical services) that might support the licensee’s response to onsite emergencies.⁴

² 10 CFR 50.47(d) states, in part, “Notwithstanding the requirements of paragraphs (a) and (b) of this section, and except as specified by this paragraph, no NRC or FEMA review, findings, or determinations concerning the state of offsite emergency preparedness or the adequacy of and capability to implement State and local or utility offsite emergency plans are required prior to issuance of an operating license authorizing only fuel loading or low power testing and training (up to 5 percent of the rated thermal power).”

³ In the statement of considerations (SOC) for the Final Rule to 10 CFR Part 72, “Emergency Planning Licensing Requirements for Independent Spent Fuel Storage Facilities (ISFSI) and Monitored Retrievable Storage Facilities (MRS)” (60 *Federal Register* (FR) 32430; June 22, 1995), the Commission stated that “NUREG-1140 concluded that the postulated worst-case accident involving an ISFSI has insignificant consequences to public health and safety. Therefore, the final requirements to be imposed on most ISFSI licensees reflect this fact, and do not mandate formal offsite components to their onsite emergency plans.” The Commission also stated, “[B]ased on the potential inventory of radioactive material, potential driving forces for distributing that amount of radioactive material, and the probability of the initiation of these events, the Commission concludes that the offsite consequences of potential accidents at an ISFSI or a [monitored retrieval storage facility] would not warrant establishing Emergency Planning Zones” (60 FR 32435).

⁴ The requirements for licensees to maintain agreements for fire-fighting and local law enforcement services exist outside of emergency planning requirements (i.e., the requirement for licensees to maintain a fire protection plan in

The EP exemptions also relieve the licensee from the requirement to maintain formal offsite REP plans, including the 10-mile plume exposure pathway and 50-mile ingestion pathway EPZs. However, licensees that have been granted EP exemptions must continue to maintain an onsite emergency plan addressing the classification of an emergency, notification of emergencies to licensee personnel and offsite authorities, and coordination with designated offsite government officials following an event declaration.

In evaluating the EP exemptions requested by the licensee, specifically in relation to relieving the licensee from the requirement to maintain formal offsite REP plans, the NRC staff considered the conclusions from recent SFP studies completed since the publication of NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," dated February 2001 (Reference 21), which served as the technical basis for SECY-01-0100, "Policy Issues Related to Safeguards, Insurance, and Emergency Preparedness Regulations at Decommissioning Nuclear Power Plants Storing Fuel in Spent Fuel Pools" (Reference 22). In addition, the NRC staff considered enhancements put into place as a result of the events of September 11, 2001, and the accident at the Fukushima Dai-ichi site on March 11, 2011.

The studies, described in more detail below, helped to inform NRC staff positions that only a highly unlikely, beyond-design-basis event (e.g., extreme earthquake or large aircraft impact) would cause sufficient damage to the SFP structure to result in a rapid SFP water draindown and potential zirconium cladding fire. In addition, there would be a significant amount of time between the initiating event (i.e., the event that causes the SFP level to drop) and the possible onset of conditions that could result in a zirconium cladding fire. This time provides a substantial opportunity for event mitigation. Licensees are required to maintain effective strategies, sufficient resources, and adequately trained personnel to mitigate such an event. If State or local governmental officials determine that offsite protective actions are warranted, then sufficient time and capability would be available for OROs to implement these measures using a comprehensive emergency management plan (CEMP) or "all-hazards," approach.⁵

2.1 Spent Fuel Pool Study Considerations

Following the permanent removal of spent fuel from the reactor vessel, the principal radiological risks are associated with the storage of spent fuel onsite. Generally, a few months after the reactor has been permanently shutdown there are no possible design basis events that could result in a radiological release exceeding the U.S. Environmental Protection Agency (EPA), EPA-400/R-17/001, "PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents," dated January 2017 (Reference 24), early phase protective action guide (PAG) limit of one roentgen equivalent man (rem) at the exclusion area boundary (EAB) of the site.

The only potential accident that might lead to a significant radiological release at a decommissioning power reactor is a zirconium cladding fire. The zirconium cladding fire

10 CFR 50.48, "Fire protection," and physical security requirements in 10 CFR Part 73, "Physical Protection of Plants and Materials").

⁵ A CEMP or "all-hazards" approach in this context, also referred to as an emergency operations plan, is addressed in FEMA's Comprehensive Preparedness Guide (CPG) 101, "Developing and Maintaining Emergency Operations Plans," Version 2.0, dated November 2010 (Reference 23).

scenario is a postulated, but highly unlikely, beyond-design-basis accident (DBA) scenario that involves a major loss of water inventory from the SFP, resulting in a significant heat up of the spent fuel due to the loss of all cooling, and culminating in substantial zirconium cladding oxidation and fuel damage. The significance of spent fuel heatup scenarios that might result in a zirconium cladding fire depends on the decay heat of the irradiated fuel stored in the SFP. The amount of decay heat in the spent fuel is directly associated with the amount of time since the reactor permanently ceased power operations. Therefore, the probability of a zirconium cladding fire scenario continues to decrease as a function of the time that the decommissioning power reactor has been permanently shutdown and defueled.

The NRC staff assessed the risk of an SFP accident at decommissioning nuclear power plants in the late 1990s to support development of a risk-informed technical basis for review of exemption requests and creation of a regulatory framework for integrated rulemaking. 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 (Reference 25), and NUREG-1738 confirmed that for permanently shutdown and defueled power reactors that are bounded by the assumptions and conditions in the report, the risk of an offsite radiological release is significantly less than for an operating power reactor.

The NRC staff's assessment, published in NUREG-1738, conservatively assumed that if the water level in the SFP did drop below the top of the spent fuel, a zirconium cladding fire involving the spent fuel would occur, and thereby bounded those conditions associated with air cooling of the fuel (including partial draindown scenarios) and fire propagation. The study used simplified and sometimes bounding assumptions and models to characterize the likelihood and consequences of beyond-design-basis SFP accidents. Even with these conservative assumptions, the study found the risk of an SFP fire to be low and well within the Commission's safety goals. The amount of time available after the fuel is completely uncovered, but before a zirconium cladding fire, depends on various factors, including decay heat rate, fuel burnup, fuel storage configuration, building ventilation rates and air flow paths, and fuel cladding oxidation rates. Although the NUREG-1738 assessment did not completely rule out the possibility of a zirconium fire, it did demonstrate that storage of spent fuel in a high-density configuration in SFPs is safe, and that the risk of accidental release of a significant amount of radioactive material to the environment is low.

After the events of September 11, 2001, Sandia National Laboratories conducted studies (collectively referred to as the "Sandia studies"), which considered spent fuel loading patterns and other aspects for an SFP at a PWR and a BWR, including the role that the circulation of air plays in the cooling of spent fuel in the SFP. The Sandia studies indicated that there is a significant amount of time between the initiating event and the spent fuel assemblies becoming partially or completely uncovered. In addition, the Sandia studies indicated that for those hypothetical conditions where air cooling may not be effective in preventing a zirconium cladding fire, there is a significant amount of time between the spent fuel becoming uncovered and the possible onset of such a zirconium cladding fire, thereby providing a substantial opportunity for event mitigation. The Sandia studies, which account for relevant heat transfer and fluid flow mechanisms, also indicated that air cooling of spent fuel could be sufficient to prevent SFP zirconium fires at a point much earlier following fuel offload from the reactor than previously considered (e.g., in NUREG-1738). The findings of the Sandia studies are sensitive, security-related information and are not available to the public.⁶

⁶ A redacted summary of the Sandia studies is publicly available (Reference 26).

In 2013, the NRC documented a regulatory analysis for expediting the transfer of spent fuel assemblies in COMSECY-13-0030, “Staff Evaluation and Recommendation for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel” (Reference 27). In this analysis, the NRC staff concluded that SFPs are robust structures with large safety margins and recommended to the Commission that possible regulatory actions to require the expedited transfer of spent fuel from SFPs to dry cask storage were not warranted. The Commission subsequently approved the NRC staff’s recommendation in the Staff Requirements Memorandum to COMSECY-13-0030 (Reference 28).

In 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 (Reference 29), the NRC evaluated the potential benefits of strategies required in 10 CFR 50.54(hh)(2) (now 10 CFR 50.155(b)(2)).⁷ The study results for the analyzed severe earthquake at the Reference plant are consistent with conclusions in past studies that SFPs are robust structures and likely to withstand severe earthquakes without leaking. The study showed the likelihood of a radiological release from the spent fuel, resulting from a severe earthquake at the Reference plant, to be about one time in 10 million years or lower. If a radiological release were to occur, this study also shows that the individual cancer fatality risk for a member of the public is several orders of magnitude lower than the Commission’s Quantitative Health Objective of 2 in 1 million (2×10^{-6} /year). As explained in NUREG-2161, successful implementation of mitigation strategies significantly reduces the likelihood of a release from the SFP in the event of a loss of cooling water. Additionally, the NRC found that the placement of spent fuel in a dispersed configuration in the SFP, such as the 1 x 4 pattern, more effectively used the heat capacity of the stored fuel and available cooling mechanisms to extend the heat up time and reduce the likelihood of a release from a completely drained SFP.

As part of informing its current integrated decommissioning rulemaking effort, the NRC staff conducted an applied research study, as documented in a memorandum entitled “Transmittal of Reports to Inform Decommissioning Plant Rulemaking for User Need Request NSIR-2015-001,” dated May 31, 2016 (Reference 30), and concluded:

- The representative plant staff can reliably implement mitigation strategies to timely mitigate cask-drop events and prevent spent fuel heat up damage;
- Only the events causing a rapid SFP water draindown (e.g., extreme earthquake or large aircraft impact) would challenge successful mitigation of fuel heat up; and
- Even in the event of a highly unlikely beyond-DBA leading to a rapid draindown of the SFP and subsequent zirconium cladding fire, there may be an additional time margin, on the order of several hours beyond the 10-hour heat up time, during which protective actions can be taken to protect the public before the dose levels associated with the EPA early phase PAGs would be exceeded offsite.

In addition, for the hypothetical event sequence considered in the study above, i.e. the highly unlikely beyond-DBA leading to a rapid draindown of the SFP and subsequent zirconium cladding fire, acute fatal radiological effects offsite appear to be unlikely from the source term

⁷ “Mitigation of Beyond-Design-Basis Events; Final Rule” (84 FR 39684; August 9, 2019).

evaluated, provided that individuals can be relocated within a reasonable time after plume arrival, which in most cases was longer than 24 hours.

As previously stated, these SFP studies (NUREG-1738, the Sandia studies, NUREG-2161, COMSECY-13-0030, and studies supporting the decommissioning rulemaking efforts) support the NRC staff positions that:

- There would be sufficient time between an initiating event and the possible onset of conditions that could result in a zirconium cladding fire, which would provide a substantial opportunity for successful mitigation measures; and
- Only a highly unlikely, beyond-design-basis event (e.g., extreme earthquake or large aircraft impact) could cause sufficient SFP structural damage to uncover the fuel and potentially support development of a zirconium cladding fire and, even in such cases, the fuel may be air coolable following a complete draindown.

As such, 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-DBA resulting in a loss of the SFP water inventory, there would be time to initiate appropriate SFP mitigation actions. If State or local governmental officials determine that offsite protective actions are warranted, then sufficient time and capability would be available for OROs to implement these measures using a CEMP approach.

2.2 Spent Fuel Pool Hostile Action-Based Event Considerations

Licensees develop strategies in order to protect against the NRC design basis threat⁸ for radiological sabotage and are required to maintain these strategies under the provisions of 10 CFR 73.55(b) until the termination of their 10 CFR Part 50 (or 10 CFR Part 52) license. In addition, other Federal agencies, such as the Federal Aviation Administration, the Federal Bureau of Investigation, and the Department of Homeland Security have taken aggressive steps to prevent terrorist attacks in the United States. Taken as a whole, these systems, personnel, and procedures provide reasonable assurance that public health and safety, the environment, and the common defense and security will be adequately protected (see 73 FR 46204 through 46207; August 8, 2008).

Numerous NRC regulatory activities and studies have reaffirmed the safety and security of spent fuel stored in pools and showed that SFPs are effectively designed to prevent accidents and minimize damage from malevolent attacks. In the wake of the terrorist attacks of September 11, 2001, the NRC took several actions to further reduce the possibility of a zirconium cladding fire in an SFP. The NRC issued Order EA-02-026, "Order for Interim Safeguards and Security Compensatory Measures," dated February 25, 2002, (Reference 31), requiring licensees to immediately implement additional security measures, including increased patrols, augmented security forces and capabilities, and more restrictive site-access controls to, among other things, reduce the likelihood of an SFP accident resulting from a terrorist-initiated event. Through the NRC's issuance of the "Power Reactor Security Requirements" final rule on March 27, 2009 (74 FR 13926), the agency codified generically applicable security requirements that had been previously issued by orders. Subsequently, by letter dated November 28, 2011, (Reference 32), the NRC partially rescinded Order EA-02-026. However, the requirements of

⁸ The DBT represents the largest threat against which a private sector facility can be reasonably expected to defend, with high assurance. The NRC's Design Basis Threat rule was published in the *Federal Register* on March 19, 2007 (72 FR 12705).

Order EA-02-026 that were addressed by Interim Compensatory Measure (ICM) B.1.a involved operator training for specific security-initiated events that were not covered by the proposed or existing regulations and remained in effect after the NRC rescinded other parts of the Order.

2.3 Spent Fuel Pool Mitigative Action Considerations

The NRC Order EA-02-026 also established new requirements for licensees to have mitigating strategies for the potential loss of SFP water inventory and for large fires or explosions at nuclear power plants. In response, the Nuclear Energy Institute (NEI) provided detailed guidance in NEI 06-12, "B.5.b Phase 2 and 3 Submittal Guideline," Revision 2, dated December 2006 (Reference 33), which the NRC endorsed on December 22, 2006 (Reference 34). The NRC found the NEI guidance to be an effective means for mitigating the potential loss of large areas of the plant due to fires or explosions. In addition, these mitigative strategies enhanced the ability to cool the spent fuel and the potential to recover SFP water level and cooling prior to a potential SFP zirconium cladding fire, which further reduced the probability of a radiological release.

The 2009 security requirements final rule also added the requirement for licensees to implement mitigating measures to maintain or restore SFP cooling capability in the event of loss of large areas of the plant due to fires or explosions, which further decreases the probability of a zirconium cladding fire in an SFP. Specifically, under 10 CFR 50.155(b)(2), nuclear power reactor licensees are required to implement strategies such as those provided in NEI-06-12.⁹ Palisades mitigative strategies will continue to be maintained to satisfy the applicable license conditions of the Renewed Facility Operating License.

Furthermore, other organizations, such as Sandia National Laboratories, as discussed previously under "Spent Fuel Pool Considerations," have confirmed the effectiveness of the additional mitigation strategies to maintain spent fuel cooling in the event that the pool is drained, and its initial water inventory is reduced or lost entirely.

In response to the Fukushima Dai-ichi Accident, the NRC implemented regulatory actions to further enhance reactor and SFP safety. On March 12, 2012, the NRC issued Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (Reference 35), which requires licensees to develop, implement, and maintain guidance and strategies to maintain or restore SFP cooling capabilities, independent of normal alternating current power systems, following a beyond-design basis external event.

In addition, on March 12, 2012, the NRC also issued Order EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation" (Reference 36), which requires that licensees install reliable means of remotely monitoring wide-range SFP levels to support effective prioritization of event mitigation and recovery actions in the event of a beyond-design-basis external event. Although the primary purpose of the order was to ensure that operators were not distracted by uncertainties related to SFP conditions during accident response, the improved monitoring capabilities will likewise help in the diagnosis and response

⁹ The guidance in NEI-06-12 specifies that portable, power-independent pumping capabilities must be able to provide at least 500 gallons per minute (gpm) of bulk water makeup to the SFP, and at least 200 gpm of water spray to the SFP. Recognizing that the SFP is more susceptible to a release when the spent fuel is in a non-dispersed configuration, the guidance also specifies that the portable equipment is to be capable of being deployed within two hours for a non-dispersed configuration.

to potential losses of SFP integrity. These requirements ensure a more reliable and robust mitigation capability is in place to address degrading conditions in SFPs resulting from certain significant but highly unlikely events. Through the NRC's issuance of the "Mitigation of Beyond-Design-Basis Events" final rule on August 9, 2019, the agency codified the generally applicable requirements in Order EA-12-049 and Order EA-12-051.

2.4 Spent Fuel Pool Offsite Radiological Emergency Preparedness Considerations

The NRC staff determined, based on the EP exemption evaluation criteria discussed in Section 3.0 of this safety evaluation, that in the event of a beyond-design-basis event impacting SFP integrity, or the ability to cool spent fuel, the licensee will maintain sufficient resources and adequately trained personnel available on-shift to promptly initiate mitigative actions without the support of OROs. In the highly unlikely event of a zirconium cladding fire in the SFP, due to a beyond-design-basis event that results in the loss of all spent fuel cooling, sufficient time would exist for offsite government officials to implement protective measures, if they deem warranted, using a CEMP approach. Therefore, the NRC staff concluded, consistent with previous similar exemption requests, that formal offsite REP plans, required under 10 CFR Part 50, are not necessary for permanently shutdown and defueled nuclear power reactor licensees once the evaluation criteria outlined in Section 5, "Evaluation of Exemptions to EP Regulations," of the Office of Nuclear Security and Incident Response (NSIR), Division of Preparedness and Response (DPR) Interim Staff Guidance (ISG) document NSIR/DPR-ISG-02, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants," dated May 11, 2015 (Reference 37), have been satisfied.

In addition, consistent with the December 7, 2015, "Memorandum of Understanding Between the Department of Homeland Security/Federal Emergency Management Agency and Nuclear Regulatory Commission Regarding Radiological Emergency Response, Planning and Preparedness" (Reference 38), by letter dated December 13, 2022 (Reference 39), the NRC staff documented the transmittal to Federal Emergency Management Agency (FEMA), by electronic mail, a draft of the proposed SECY paper related to the Palisades request and offered the opportunity for FEMA to ask questions, obtain clarification, and comment on the draft SECY paper before the Commission received it for review. In a letter dated February 17, 2023 (Reference 40) FEMA provided comments.

Under the proposed EP exemptions, the licensee would still be required to maintain an onsite emergency plan, which would provide for the notification of and coordination with OROs to an extent commensurate with the approved exemptions. Licensee requirements for offsite fire services and law enforcement responding onsite will continue to be maintained under the licensee's fire protection plan and physical security plan in accordance with 10 CFR 50.48 and 10 CFR Part 73, respectively. In the Staff Requirements Memorandum (SRM) to SECY-23-0043, "Request by Holtec Decommissioning International, LLC for Exemptions from Certain Emergency Planning Requirements for Palisades Nuclear Plant," dated December 7, 2023 (Reference 41), the Commission approve the licensee's requested EP exemptions as recommended by the NRC staff in SECY-23-0043 (Reference 42). 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.

3.0 REGULATORY EVALUATION

The regulations in 10 CFR 50.12(a)(2)(ii) provide that the NRC may, upon application by a licensee or on its own initiative, grant exemptions from the requirements of the regulations in 10 CFR Part 50 in circumstances for which application of the regulation would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.¹⁰ As discussed in the Statement of Considerations (SOC) for the Final Rule for EP requirements for 10 CFR Part 50 and 10 CFR Part 70 (45 FR 55402; August 19, 1980), the underlying purposes of the planning standards in 10 CFR 50.47(b), the requirements in 10 CFR 50.47(c)(2), and certain requirements of Section IV of Appendix E to 10 CFR Part 50, are to: (1) ensure that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency, and (2) ensure that licensees maintain effective offsite and onsite radiological emergency response plans.

The NRC staff relied on past precedent to assess whether the licensee's request for EP exemptions satisfied the underlying purposes of the EP regulations. As discussed previously, the exemptions requested by the licensee for Palisades that eliminate requirements for formal offsite REP plans are consistent with those recently approved by the NRC for the Kewaunee Power Station, Crystal River Unit 3 Nuclear Generating Plant, San Onofre Nuclear Generating Station, Units 2 and 3, Vermont Yankee Nuclear Power Station, Fort Calhoun Station, Oyster Creek Nuclear Generating Station, the Pilgrim Nuclear Power Station, the Three Mile Island Nuclear Station, and the Duane Arnold Energy Center. Prior to these sites, the last approved exemption that eliminated the requirements for formal offsite REP planning was for the Zion Nuclear Power Station in 1999 (Reference 43).

The NRC staff recognizes that the planning standards in 10 CFR 50.47(b), the requirements in 10 CFR 50.47(c)(2), and certain requirements in Section IV of Appendix E to 10 CFR 50 were developed taking into consideration the risks associated with accidents that have the potential for significant offsite radiological dose consequences during operation of a nuclear power reactor at its licensed full-power level. As discussed previously, the NRC staff has concluded that after a reactor has permanently ceased power operations and removed all fuel from the reactor vessel to the SFP, the risks associated with accidents that have a potential for offsite radiological release are significantly reduced for those licensees that are reasonably aligned with the analyses presented in NUREG-1738. This position has been further informed by the recent spent fuel pool studies provided in NUREG-2161.

Based on the highly unlikely nature of postulated beyond-design-basis events resulting in a loss of SFP integrity or all cooling to the spent fuel that may result in significant offsite radiological consequences, the NRC staff considers that the special circumstances condition of 10 CFR 50.12(a)(2)(ii) can be met by demonstrating that Palisades satisfies the two criteria provided below. Specifically, the planning standards in 10 CFR 50.47(b), the requirements in 10 CFR 50.47(c)(2), and certain requirements in Section IV of Appendix E to 10 CFR Part 50, from which the licensee has requested exemptions, would not serve, or be necessary to achieve, the underlying purpose of the EP regulations if the Palisades site-specific analyses demonstrate that:

¹⁰ Notwithstanding the special circumstances of the exemption request, 10 CFR 50.12(a)(1) requires that the exemption must be authorized by law, not present an undue risk to the public health and safety, and be consistent with the common defense and security.

1. An offsite radiological release from a DBA will not exceed the EPA early phase PAGs of one rem at the exclusion area boundary¹¹; and
2. In the highly unlikely event of a beyond-design-basis event, resulting in a loss of all modes of cooling for the spent fuel stored in the SFP, there is a minimum of 10 hours for the hottest fuel assembly to reach 900 degrees Celsius (°C), which is the critical temperature threshold for a self-sustained oxidation of zirconium cladding in air. This time provides a substantial opportunity for event mitigation. Licensees are required to maintain effective strategies, sufficient resources, and adequately trained personnel to mitigate such an event.

Previously granted exemptions from EP regulations reduced the level of EP requirements consistent with the regulations for a licensee authorized for fuel loading and low power testing only, as specified in the standards of 10 CFR 50.47(d), and are consistent with the information requirements for an ISFSI emergency plan, as required by 10 CFR 72.32(a). Examples of the reduced EP requirements include: setting the highest emergency classification level as an "Alert"; extending the timing requirements for notification of offsite authorities; requiring only onsite exercises with the opportunity for ORO participation; and only maintaining arrangements for the OROs (i.e., law enforcement, fire, and medical services) that may respond to onsite emergencies. No formal offsite REP plans, in accordance with 44 CFR Part 350, were required after the exemptions were granted for these licensees.

As part of the review of the licensee's exemption request, the NRC staff used NSIR/DPR-ISG-02, the EP regulations in 10 CFR 72.32, and the NUREG-2215, "Standard Review Plan for Spent Fuel Dry Storage Systems and Facilities," dated April 2020 (Reference 45), as references to ensure consistency between specific-licensed and general-licensed ISFSI. Furthermore, the licensee addressed the Industry Decommissioning Commitments (IDCs) and Staff Decommissioning Assumptions (SDAs)¹² that formed the basis of the analyses presented in NUREG-1738.

4.0 TECHNICAL EVALUATION

The following NRC staff evaluation verifies that the licensee provided the analyses described in Section 5 of NSIR/DPR-ISG-02. These analyses meet the criteria in the ISG to justify elimination of the requirements on the licensee to maintain the 10-mile plume exposure pathway, the 50-mile ingestion pathway EPZs, and formal offsite REP plans. The discussion that follows lists each ISG criterion, followed by the NRC staff's evaluation of the licensee's consistency with that ISG criterion for Palisades.

- 4.1 The licensee has performed an analysis indicating that any radiological release from the applicable remaining DBAs would be within the dose limits of 10 CFR 50.67, "Accident

¹¹ Use of EPA early phase PAGs as a threshold is consistent with the planning basis for the 10-mile EPZ provided in NUREG-0396 (EPA 520/1-78-016), "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," dated December 1978 (Reference 44), and endorsed by the Commission in a policy statement published on October 23, 1979 ("Planning Basis for Emergency Responses to Nuclear Power Reactor Accidents," 44 FR 61123).

¹² NEI proposed IDCs in a letter to the NRC dated November 12, 1999 (Reference 46). The NRC identified several additional SDAs through the NRC staff's risk assessment and evaluation of the safety principles for decommissioning plants in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Revision 2, dated May 2011 (Reference 47). The IDCs and SDAs are summarized in Table 4.2-1 and Table 4.2-2 to NUREG-1738.

source term,” and dose acceptance criteria in Regulatory Guide (RG) 1.183, “Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors” (Reference 48). The licensee evaluated the maximum 2-hour total effective dose equivalent (TEDE) to an individual located at the EAB, and the 30-day TEDE to an individual at the outer boundary of the low population zone and the control room. The resulting doses would not approach the EPA early phase PAGs recommendation for protection of the public.

Evaluation: the licensee states that the irradiated fuel will be stored in the SFP and ISFSIs. The licensee further states, and the NRC staff agrees, that while spent fuel remains in the SFP, the only postulated DBAs that would remain applicable to the permanently defueled Palisades facility that could contribute a significant dose would be: (1) a fuel handling accident (FHA) in the spent fuel pool; (2) a liquid waste incident; (3) a waste gas incident; and (4) postulated cask drop accident.

Fuel Handling Accident

The licensee states that following permanent cessation of power operations and permanent removal of fuel from the Palisades reactor, an FHA in the reactor cavity is no longer applicable because all irradiated spent fuel will either be stored in the Palisades SFP or ISFSI. Therefore, because an FHA can only occur during movement of spent fuel in the SFP, the FHA event is limited to the SFP. The licensee’s FHA analysis assumed 22.5 feet of water above the stored spent fuel. For a water cover depth of 22.5 ft, the licensee calculated an elemental iodine decontamination factor of 252 and an overall iodine decontamination factor of 183.07 using guidance from RG 1.183 and from a technical paper entitled, “Evaluation of Fission Product Release and Transport for Fuel Handling Accident,” (Reference 49). Consistent with RG 1.183, the licensee credited an infinite decontamination factor for the remaining particulate forms of the radionuclides contained in the gap activity. In accordance with RG 1.183, the licensee did not credit decontamination from water scrubbing for the noble gas constituents of the gap activity. The FHA utilizes the Alternate Source Term methodology described in RG 1.183.

The NRC staff previously approved the revised DBA radiological consequence analyses in License Amendment No. 272, “Palisades Nuclear Plant – Issuance of Amendment No. 272 Re: Permanently Defueled Technical Specifications (EPID L-2021-LLA-0099,” dated May 13, 2022 (Reference 50). As documented in the NRC’s safety evaluation for License Amendment No. 272, the staff determined that 17 days is the amount of time needed for decay to meet the EPA early phase PAG limit of 1 rem TEDE at the EAB. In using the same assumptions, except for decay time, the licensee’s dose analysis for an FHA with 60 days of decay in the SFP results in a dose of 0.014 rem TEDE at the EAB. This result meets the 6.3 rem acceptance criteria of RG 1.183 at the EAB and low population zone. In addition, it also meets the EPA early phase PAG criterion of 1 rem TEDE and below 10 percent (%) EPA PAG threshold for declaration of a Site Area Emergency. NRC staff review of this calculation determined that the change in decay time is appropriate for this exemption request because the licensee’s request for the exemption is to show that the dose consequences from an accident after 12 months does not result in a radiological release requiring offsite protective actions, and the licensee’s calculation only accounts for 60 days of decay.

Based on the permanent shutdown of Palisades on May 20, 2022, the 12 months of decay time will have elapsed on May 31, 2023. The NRC staff notes that the doses from

an FHA are dominated by the isotope Iodine-131. After 12 months of decay, the thyroid dose from an FHA would be negligible. With 12 months of decay, the only isotope remaining in significant amounts, among those postulated to be released in a DBA FHA, would be Krypton-85. Because Krypton-85 primarily decays by beta emission, the calculated skin dose from an FHA release would make an insignificant contribution to the TEDE, which is the parameter of interest in the determination of the EPA early phase PAGs for sheltering or evacuation. The staff concludes that the dose consequences from an FHA for the permanently defueled Palisades meet the applicable dose criteria and that the doses are below the EPA early phase PAG criterion of 1 rem TEDE.

Liquid Waste Incident

The licensee states that a liquid tank failure remains a viable accident following the reactor being permanently defueled since liquid tanks may continue to store radioactive liquid. The accidents include an accidental discharge to the circulating water discharge canal, or failure of the primary system makeup storage tank or the utility water storage tank. The licensee states that the primary makeup storage tank and the utility water storage tank have administrative controls that maintain tank activity concentrations such that 10 CFR Part 20, "Standards for Protection Against Radiation," dose limits would not be exceeded in the event of a tank failure and that these concentration limits will be maintained in the permanently defueled condition.

The licensee concluded that the Palisades design and administrative controls ensure that radioactive liquid leakage or spillage will be retained within the facility or within 10 CFR Part 20 dose limits. In addition, the licensee states that administrative controls and automatic interlocks, together with the fail-safe design of the instrumentation and control devices, provide assurance against discharge of liquid wastes to the environs in excess of 10 CFR Part 20 limits and would not approach the EPA early phase PAG criteria of 1 rem TEDE after a 90-day fuel decay period.

As documented in the NRC's safety evaluation for License Amendment No. 272, dated May 13, 2022, the staff previously reviewed and approved the liquid waste tank failure assumptions. In this evaluation, the staff determined that the licensee's administrative controls, system design, and system monitoring would maintain tank concentrations such that the dose limits provide in 10 CFR Part 20 would not be exceeded. For this exemption, the NRC staff finds that these conclusions are still appropriate and are consistent with the discussions provided in this exemption request.

Waste Gas Incident

The licensee evaluated the accidental release of waste gas. The licensee states that the volume control tank rupture accident is no longer applicable in the permanently defueled condition because primary coolant letdown will no longer be required to support primary coolant system operation. In addition, inputs into the volume control tank rupture accident discussed in the Updated Final Safety Analysis Report, Section 14.21.2 (Reference 51), such as letdown flow and dose equivalent Iodine-131 requirements, will no longer be applicable in the permanently defueled condition. In the event that the volume control tank continues to hold reactor coolant fluid in the permanently defueled condition, the source term would be lower than during normal operation due to radioactive decay. The licensee further states that, the primary coolant iodine and noble gas concentrations released to the atmosphere from the volume control tank after

17 days of decay would be significantly less than the source term from the FHA with 17 days of decay and the control room doses from the FHA.

As documented in the NRC's safety evaluation for License Amendment No. 272, dated May 13, 2022, the staff previously reviewed and approved the accidental release of waste gas assumptions. In this safety evaluation, the NRC staff determined that this accident would be bound by the FHA analysis given 17 days of decay in the volume control tank. For this exemption request, the NRC staff finds that these conclusions are still appropriate and are consistent with the discussions provided in this exemption request.

Postulated Cask Drop Accident

The licensee evaluated the postulated cask drop accidents and provided an analysis that included a scenario in which a cask is dropped onto spent fuel which has decayed for 90 days. The licensee assumes the Fuel Handling Building (FHB) charcoal filters are not operating and all radiation is released unfiltered from the FHB to the external environment.

As documented in the NRC's safety evaluations for License Amendment No. 226, "Palisades Plant – Issuance of Amendment Re: Alternative Radiological Source Term (TAC No. MD3087)," dated September 28, 2007(Reference 52), and License Amendment No. 272, dated May 13, 2022, the NRC staff previously reviewed and approved that the licensee would not need the fuel handling areas ventilation system nor Control Room Ventilation filtration to meet applicable dose criteria if the fuel in the SFP had been decaying for at least 90 days. Specifically, the NRC staff's conclusions were based on meeting the 6.3 rem acceptance criteria of RG 1.183 at the EAB and LPZ. In License Amendment No. 226, the staff reviewed and independently verified the licensee's assessment for a release assuming no filtration and 90 days of decay, which resulted in a dose of 0.08 rem at the EAB. For this exemption request, the NRC staff reviewed the licensee's information provided in its requests for License Amendment Nos. 226 and 272, and the staff's safety evaluations for those respective license amendments, and accordingly finds that the assumptions and calculations used in those issued amendments are still appropriate for this safety evaluation analysis. Therefore, the staff finds the analyses by the licensee and the NRC staff for License Amendment No. 226 is acceptable for the current exemption request, and the stated dose result and is less than the EPA early phase PAG criterion of 1 rem TEDE and below 10% EPA PAG threshold for declaration of a Site Area Emergency.

The NRC staff reviewed the consequences of the FHA in the SFP, the liquid waste incident, a waste gas incident, and a postulated cask drop accident in detail during the review of the previously approved license amendment requests and found them to be acceptable. Since this information has not changed for this exemption request, the NRC staff relied on previous analyses by the licensee and NRC staff safety evaluations for license amendment requests (LAR) No. 226 and 272 to conduct the review of this exemption request. The NRC staff notes that, while the licensee continues to rely on the information from the previously approved LARs, the calculated doses would be expected to be lower when the exemption is implemented, due to additional decay time beyond the time assumed in the NRC staff's respective safety evaluations for the approved License Amendment Nos. 226 and 272. Since the dose at the EAB will not exceed the

1 rem limit, the NRC staff finds it acceptable to support approval of the exemption request.

- 4.2 The licensee has performed an analysis demonstrating that after the spent fuel has decayed for 12 months, with a complete loss of SFP water inventory and no accompanying heat loss (i.e., adiabatic heat up), a minimum of 10 hours would be available before any fuel cladding temperature reaches 900°C from the time all cooling is lost.

Evaluation: The NRC staff evaluates the ability to mitigate beyond-design-basis events considering the time available to implement measures to maintain the spent fuel cool or, if necessary, implement an appropriate emergency response. The NRC staff uses an assessment of the adiabatic heat up to determine the available time because adiabatic heat up is generally the limiting condition. The heat up time calculated is the time to reach a temperature of 900°C, which correlates to 1,652 degrees Fahrenheit (°F) and the temperature where “runaway oxidation” (zirconium cladding fire) is expected to occur, as defined in NUREG-1738, “Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants,” dated February 2001.

The 10-hour criterion, conservatively, does not consider the time to uncover the spent fuel and assumes instantaneous loss of cooling to the spent 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 preplanned 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.

The licensee performed an analysis demonstrating that 12 months after Palisades permanently shutdown, the spent fuel stored in the SFP will have decayed to the extent that the requested exemptions may be implemented at Palisades without any additional compensatory actions. Given Palisades’ permanent shutdown date was May 20, 2022, and the fuel decay time of 12 months, May 31, 2023, terminates the period in which the spent fuel could heat up to clad ignition temperature within 10 hours under adiabatic conditions. This analysis, “Spent Fuel Pool Heat Load Limits for Palisades,” dated July 8, 2022 [non-public] was submitted by the licensee in support of this exemption request. The analysis determined the decay time necessary to ensure at least a 10-hour heat up time considering the thermal capacity of the portion of the spent fuel assembly that heats uniformly and the decay heat rate of the spent fuel. The licensee’s analysis shows 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.¹³

¹³ A comprehensive emergency management plan or “all-hazards” approach in this context, also referred to as an emergency operations plan, is addressed in the Federal Emergency Management Agency’s (FEMA) Comprehensive Preparedness Guide 101, “Developing and Maintaining Emergency Operations Plans,” Version 2.0, dated

The licensee states that their determined doses at the EAB and the Palisades control room 12 months after shutdown are less than 0.20 mrem/hour and 2.5 mrem/hour, respectively. The staff reviewed the details of the calculation used to support the determination of the 0.20 mrem/hour at the EAB and 2.5 mrem/hour at the control room doses. The licensee's calculations used SCALE and Monte Carlo N-particle computer programs to perform their calculations. The licensee's calculations approximated dose from the spent fuel to the top of the SFP and used the line beam response method to calculate the dose to the EAB and the Palisades control room. The staff finds that the use of these computer codes, and the line beam response method to calculate dose are appropriate for determining doses from such a SFP accident to the EAB and control room. The NRC staff reviewed the calculation to verify that important physical properties of materials were within acceptable ranges and that the results were accurate. The staff determined that physical properties were appropriate and completed independent confirmatory calculations that produced similar results. Therefore, the staff found that after 12 months of decay, at least 10 hours would be available before a significant offsite release could begin. The staff concluded that the adiabatic heat up calculation provided an acceptable method for determining that a minimum of 10 hours would be available before any spent fuel cladding temperature reaches 900°C from the time all cooling is lost.

The NRC staff reviewed and found the licensee's calculations acceptable and determined that the stated doses are an appropriate estimate for this beyond-design-basis event. Therefore, the staff finds that the licensee demonstrated through calculations that given the EPA early phase PAG limit of 1 rem TEDE, the licensee would have sufficient time to develop and implement onsite mitigative actions and that additional offsite measures could be taken without preplanning if efforts to reestablish shielding over the spent fuel are delayed.

- 4.3 The licensee has performed an analysis for a loss of SFP water inventory resulting in radiation exposure at the EAB and the control room (which indicates that any release would be less than EPA early phase PAGs at the EAB).

Evaluation: NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," Supplement 1 (Reference 53), section 4.3.9, "Radiological Accidents," identifies that a SFP drain down event is beyond-design-basis. The SFP water and the concrete pool structure serve as radiation shielding. A loss of water shielding above the spent fuel could increase the offsite radiation levels because of the gamma rays streaming up out of the pool and being scattered back to a receptor at the site boundary. The radiation that is scattered due to interactions with air is sometimes referred to as "skyshine."

The licensee analyzed the bounding radiological consequences of a postulated complete loss of SFP water from the Palisades SFP as a function of time after Palisades's permanent shutdown. The primary purpose of the licensee conducting this calculation was to determine the dose rates as a function of time at the EAB and in the control room due to loss of shielding for an event in which the spent fuel assemblies are uncovered

November 2010, <https://www.fema.gov/sites/default/files/2020-07/developing-maintaining-emergency-operations-plans.pdf>.

following drain down. The dose rates determined by this calculation are due to direct and indirect radiation from spent fuel assemblies and does not consider a potential fire in the SFP for reasons discussed in the previous section above. The analysis also determined that the gamma radiation dose rates at the EAB from a loss of pool water shielding at the Palisades SFP would be less than the EPA early phase PAGs.

Based on an annual analysis, Palisades determined that the dose rate to a receptor at the EAB and the limiting dose rate in the Palisades control room at 12 months after permanent shutdown are less than 0.20 mrem/hour and 2.5 mrem/hour, respectively. Palisades concluded that the extended time required to exceed the integrated EPA early phase PAG limit of 1 rem TEDE would allow sufficient time to develop and implement onsite mitigative actions and provide confidence that additional offsite measures could be taken without preplanning if efforts to reestablish shielding over the spent fuel are delayed.

The NRC staff notes that, while the direct dose rate above the unshielded spent fuel would be high, licensee radiation protection personnel would restrict access to ensure that no one was subjected to the direct dose from the unshielded spent fuel. Therefore, the primary concern becomes the dose rate from gamma and neutron radiation that is scattered from interactions with the air above the Palisades SFP. The licensee used appropriate methods to evaluate the effects of this source of radiation at the EAB and in the Palisades control room. The analysis assumed 12 months of radioactive decay following operations. This is conservative and acceptable because it will be more than 12 months following shutdown when the exemption is implemented, if approved by the Commission.

The NRC staff reviewed the licensee's analysis description, performed an independent evaluation, and finds that appropriate methods were used to evaluate the effects of this source of radiation at the Palisades control room and the EAB. Therefore, the NRC staff concludes that the dose consequence from skyshine emitted from uncovered spent fuel in the SFP due to a loss of SFP normal cooling would not exceed a level that would warrant protective actions under the EPA early phase PAGs.

- 4.4 Considering the site-specific seismic hazard, the licensee has performed either an evaluation demonstrating a high confidence of a low probability (less than 1×10^{-5} per year) of seismic failure of the SFP storage structure, or an analysis demonstrating the fuel has decayed sufficiently that natural air flow in a completely drained pool would maintain peak cladding temperature below 565°C (the point of incipient cladding damage).

Evaluation: In 2012, ENOI, the licensee of Palisades at that time, conducted a seismic evaluation in response to an NRC letter to all power reactor licensees, "Request for Information Pursuant to Title 10 of the *Code of Federal Regulations* 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012 (Reference 54). Entergy's evaluation provided an assessment of earthquake probabilities at potentially damaging accelerations at Palisades. By letter dated May 22, 2014, the NRC accepted the results of this assessment indicating that the low seismic hazard screening criteria had been satisfied for Palisades (Reference 55).

The licensee developed an analysis demonstrating successful completion of the Enhanced Seismic Checklist provided in NUREG-1738 for the SFP demonstrating a high confidence of a low probability (less than 1×10^{-5} per year) of seismic failure of the SFP structures. This analysis is summarized in enclosure 4, to the licensee's letter dated July 11, 2022, "Palisades Spent Fuel Pool HCLPF [High Confidence of Low Probability of Failure] Evaluation."

Therefore, the NRC staff finds reasonable assurance that Criterion 4 of NSIR/DPR-ISG-02 is satisfied with respect to demonstrating a high confidence in a low probability of seismic failure for the Palisades FHB, including the SFP structures.

- 4.5 If the licensee is storing spent fuel in a SFP, the licensee should address for the decommissioning site the risk reduction measures identified in NUREG-1738 as IDCs and SDAs. The IDCs and SDAs are a set of design characteristics and operational capabilities that either help prevent a substantial loss of coolant inventory or increase the likelihood of recovery from such an event.

Evaluation: In accordance with the safety analysis in NUREG-1738, the beyond-design-basis event sequences that dominate risk at a decommissioning nuclear power reactor are large earthquake and cask drop events. This is an important difference relative to an operating nuclear power reactor, where typically a large number of different initiating events make significant contributions to risk.

Assurance that the results of the NUREG-1738 analysis are representative of the plant specific conditions at Palisades can be established by assessing the facility against certain design and operational characteristics that were assumed in the NUREG-1738 analysis. These characteristics were identified in the NUREG-1738 study as recovery, mitigation, and emergency response activities assumptions that were relied on to evaluate the likelihood of success in event sequences. In table 4, "Industry Decommissioning Commitments (IDCs) Comparison," and table 5, "Staff Decommissioning Assumptions (SDAs) Comparison" of the enclosure to its letter dated July 11, 2022, the licensee described the conformance of the Palisades facility and operations with the IDCs and the SDAs. In its discussion of the IDCs and SDAs, the licensee addressed measures in place to minimize the potential risk from event sequences that dominate risk at a decommissioning reactor with spent fuel stored in an SFP (e.g., those IDCs and SDAs related to fuel cask handling activities and seismic events).

The NRC staff evaluation focused on the licensee's conformance with IDCs and SDAs that are related to the design and operation of structures, systems, and components associated with the Palisades SFP. The summary below of the NRC staff's findings is based on an assessment of the licensee's IDC and SDA items.

IDC #1: Cask drop analyses will be performed, or single-failure-proof cranes will be used for handling of heavy loads (i.e., phase II of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants: Resolution of Generic Technical Activity A36," dated July 1980 (Reference 56) will be implemented.)

Evaluation: The licensee states that the Palisades crane design is consistent with this IDC. The licensee states that heavy load lifts in and around the area of the SFP are performed by the Fuel Pool Building Crane (L-3). The design of this crane is single-

failure-proof, as the main hoist meets the single failure criteria in accordance with NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," and NUREG-0554, "Single-Failure-Proof Cranes for Nuclear Power Plants" (Reference 57). The licensee states that because the L-3 main hoist is single-failure-proof, the likelihood of dropping the spent fuel casks in and around the SFP is extremely low, and an accidental load drop is not considered to be a credible event, such that condition 5.1.2(1) of NUREG-0612 is satisfied and analysis of cask drop accidents in accordance with condition 5.1.2(4) of NUREG-0612 is not required. In addition, the Palisades procedures provide instructions for lifting activities to meet the guidance provided in NUREG-0612. Although the main hoist of the spent fuel crane is designed and operated in accordance with single-failure-proof criteria for cask handling activities, there may be situations in which lifting devices used with the main hook do not meet these requirements or single-failure-proof features of the main hoist become disabled. In these situations, the crane would no longer meet single failure-proof requirements, and load drops could be postulated. The licensee states that, accordingly, cask drop analyses were performed to document the consequences of postulated fuel transfer cask drop accidents in the fuel handling area at Palisades. As discussed previously, under the cask drop analysis, the staff found that the previous License Amendment No. 226 analysis was acceptable for the current exemption request, and the stated dose result is less than the EPA early phase PAG criterion of 1 rem TEDE and below 10 percent EPA PAG threshold for declaration of a site area emergency.

The NRC staff reviewed the information provided and concludes that the licensee satisfies NUREG-1738 IDC #1 because the L-3 main hoist is single-failure-proof, an accidental load drop is considered not to be a credible event such that condition 5.1.2(1) of NUREG-0612 is satisfied and analysis of cask drop accidents in accordance with condition 5.1.2(4) of NUREG-0612 is not required.

IDC #2: Procedures and training of personnel will be in place to ensure that onsite and offsite resources can be brought to bear during an event.

Evaluation: The licensee maintains Palisades procedures to ensure onsite and offsite resources can be brought to bear during an event. These procedures (or equivalent) are required by NRC regulations and will be implemented as necessary depending on the type of event. The licensee states that the procedures and associated training will be updated as necessary to reflect the permanently shutdown and defueled condition.

The licensee states that following the permanent shutdown and permanent removal of fuel from the Palisades reactor vessel, the on-shift operations personnel, including certified fuel handlers and non-certified operators, will continue to be appropriately trained on the relevant procedures and on the various actions needed to provide makeup to the SFP. Following permanent cessation of power operations, maintaining SFP cooling, and inventory would be the highest priority activity. Therefore, the personnel needed to perform these actions will be always available. Finally, the licensee states that periodic emergency plan drills are conducted with opportunities for offsite response organization participation to maintain proficiency in response to a plant event.

Based on the above, the NRC staff concludes that the licensee has adequate procedures and training of personnel will be in place to ensure that onsite and offsite resources can be brought to bear during an event to satisfy the conditions assumed in the NUREG-1738 analysis.

IDC #3: Procedures will be in place to establish communication between onsite and offsite organizations during severe weather and seismic events.

Evaluation: The licensee maintains Palisades procedures that provide guidance to establish and maintain communications between onsite and offsite organizations during severe weather and seismic events. These procedures provide direction for additional actions and communications with onsite and offsite stakeholders if the event does not reach the threshold for entry into an emergency classification. If the severity of the event requires entry into an emergency classification, communications with onsite and offsite organizations will be directed by the Palisades Emergency Plan and associated procedures. The procedures list provided by the licensee (or equivalent) will be updated as necessary to reflect the permanently shutdown and defueled condition.

Based on the above, the NRC staff concludes that the licensee has adequate procedures that provide guidance to establish and maintain communications between onsite and offsite organizations during severe weather and seismic events to satisfy the assumed conditions in the NUREG-1738 analysis.

IDC #4: An offsite resource plan will be developed which will include access to portable pumps and emergency power to supplement onsite resources. The plan would principally identify organizations or suppliers where offsite resources could be obtained in a timely manner.

Evaluation: The licensee states that Palisades has procedures in place to ensure that onsite and offsite resources can be brought to bear during an event. The licensee states that two (2) trained on-shift individuals at Palisades can implement necessary actions to supply makeup water to the Palisades SFP in approximately two (2) hours. The two (2) on-shift individuals are assigned to perform this task and they do not have other assigned required emergency preparedness activities during the performance of this task that would inhibit timely performance. Therefore, the personnel needed to perform these actions will be available at all times.

The licensee maintains Palisades procedures that provide guidance to establish and maintain communications between onsite and offsite organizations during severe weather and seismic events. Palisades has multiple portable pumps and portable emergency generators that meet the Extensive Damage Mitigation Guidelines. In addition, the Palisades Emergency Plan provides guidance for communicating with and obtaining offsite resources.

The licensee maintains procedures and strategies for the movement of any necessary portable equipment that will be relied upon for mitigating the loss of SFP water. Events involving a loss of SFP cooling and/or water inventory can be addressed by implementation of SFP inventory makeup strategies required under 10 CFR 50.155(b)(2), "Mitigation of beyond-design-basis events." These capabilities are maintained by license condition 6.b of Palisades Renewed License No. DPR-20. These diverse strategies provide defense-in-depth and ample time to provide makeup water or spray to the SFP prior to the onset of zirconium cladding ignition when considering very low probability beyond-design-basis events affecting the SFP. This portable equipment can be used as required by abnormal procedures and event-based procedures may be used to support mitigation strategies for SFP damage and water supply.

Based on the above, the NRC staff concludes that the licensee has adequate procedures regarding effective use of onsite and offsite resources to respond to events affecting the SFP to satisfy the conditions assumed in the NUREG-1738 analysis.

IDC #5: SFP instrumentation will include readouts and alarms in the control room (or where personnel are stationed) for SFP temperature, water level, and area radiation levels.

Evaluation: The licensee states that Palisades maintains a technical specification that the SFP water level be maintained at or above 647 feet elevation. The licensee states SFP level is monitored by a local level indicator (ruler), which provides indication in the control room using a camera/monitor. A control room low-level alarm at 646 feet is provided via SFP Level Switch LS-0924.

SFP temperature is monitored by temperature indicating alarms TIA-0925, "Spent Fuel Pool Temp Alarm Indicator," and TIA-0926, "Spent Fuel Pool Temp Alarm Indicator," located in the SFP area. Both TIA-0925 and TIA-0926 provide input to the Plant Process Computer (PPC) with workstations in the control room and include urgent PPC alarms at 140 °F with audible annunciation as well as a PPC warning alarms at 125°F. Additionally, temperature indicating alarm TIA-0917, "Discharge From Spent Fuel Pool Heat Exchanger," also located in the SFP area provides an alarm at 115°F on the C-40 panel in the Auxiliary Building which also results in an alarm in the control room. Area radiation monitors RIA-5709 and RIA-2313, "Spent Fuel Pool Criticality Monitors," monitor the SFP area with readouts and a common alarm in the control room. The licensee states they currently have instrumentation in the SFP that meets the intent of this IDC.

Based on the above, the NRC staff concludes that the licensee maintains adequate SFP monitoring instrumentation to satisfy the conditions assumed in the NUREG-1738 analysis regarding monitoring events affecting the SFP.

IDC #6: SFP seals that could cause leakage leading to fuel uncover in the event of seal failure shall be self-limiting to leakage or otherwise engineered so that drainage cannot occur.

Evaluation: The licensee states that the SFP seal around the tilt pit gate meets the intent of the IDC. Seal failure would result in a self-limiting loss of SFP water inventory of approximately 6-7 feet, well above the top of the spent fuel. In addition, the bottom elevation of the gate seal is above the top of the spent fuel, therefore, leakage by the gates could not lead to uncovered spent fuel.

The NRC staff finds that the described design features that limit the potential for drainage through the fuel transfer system and SFP cooling system are consistent with the assumptions used in the analysis presented in NUREG-1738, and are, therefore, acceptable.

IDC #7: Procedures or administrative controls to reduce the likelihood of rapid drain down events will include (1) prohibitions on the use of pumps that lack adequate siphon protection or (2) controls for pump suction and discharge points. The functionality of anti-siphon devices will be periodically verified.

Evaluation: Palisades states that design Palisades System Operation Procedure (SOP)-27, "Fuel Pool System," provides the directions for filling and draining the SFP and includes limits on the SFP level. The licensee provides the suction, discharge, skimmer and tilt pit fill lines enter the SFP at elevations greater than 644 feet, 5 inches to assure that failures of downstream piping cannot result in unacceptable drainage of SFP water inventory.

Failure of the outlet piping system would result in draining of the SFP to the outlet level which still maintains an adequate level of water for shielding and cooling requirements. Such a failure could occur because of a wind or tornado generated missile striking a portion of the SFP cooling pump P-51B discharge piping that extends above the SFP building floor. Failure of the inlet piping would result in no loss of water from the SFP as there is no downcomer by which a siphon could be started.

Margins to the Top of Fuel for Piping Failures:

- SFP Cooling Discharge Line: 23.5 feet;
- SFP Cooling Suction Line: 20.4 feet;
- SFP Cooling Tilt Pit Fill Line: 24.0 feet;
- SFP Cooling Skimmer Line: 23.5 feet; and
- SFP Bulkhead Gate Failure: 17.0 feet.

SFP structure integrity, including the concrete SFP and the SFP steel liner is required for maintaining water inventory. Detection of gross leakage during normal operation can be accomplished with the SFP level alarm. Leakage detection for SFP stainless steel liners is a manual process of observing flow from channels between the liner and concrete through telltale drains.

Based on the above, the NRC staff concludes that the physical configuration of inlet and outlet connections and use of anti-siphon devices provide adequate control to minimize the potential for rapid drainage through permanent systems and are consistent with the assumptions used in the analysis presented in NUREG-1738.

IDC #8: An onsite restoration plan will be in place to provide repair of the SFP cooling systems or to provide access for makeup water to the SFP. The plan will provide for remote alignment of the makeup source to the SFP without requiring entry to the refuel floor.

Evaluation: The licensee states that it has various procedures that provide guidance for providing makeup water to the SFP. Palisades abnormal operating procedure (AOP)-26, "Loss of SFP Level," would likely be the initial procedure entered for this scenario. The inventory loss sections direct the user to use various sources of makeup water for the SFP.

If access to the SFP floor is available, one method is via the normal method of filling from Primary Makeup Water via hose. Additionally, an emergency fill option from the Fire Protection System via a spool piece in the SFP Heat Exchanger Room. The licensee states there are multiple ways to add makeup water to the SFP with or without entry to the refuel floor.

Palisades procedures provide actions to makeup and cool the SFP by alternate means using diverse and flexible mitigation strategies (FLEX) strategies during an extended loss of all alternating current power. SFP makeup water is provided via the portable FLEX pump manifold staged at the Turbine Building 590-foot elevation. The licensee states SFP makeup water can be accomplished through one of two methods, including direct fill from a hose routed to the SFP or through a hard pipe connection in SFP Heat Exchanger Room. 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. However, this method requires access to the SFP floor area; the hard pipe method does not.

For a loss of SFP cooling event, the licensee states that AOP-26 provides cooling options and makeup water options. Additionally, if needed, the licensee can employ Severe Accident Management Guidelines and use Emergency Management Guidelines. Severe Accident Guidelines provide guidance if the SFP water level is not intact and/or level is low or lowering due to an event. All response actions to restore SFP level are the options described above (includes plans for both an available access to the SFP floor as well as cases where access is not available). The licensee's exemption application states that these Palisades procedures provide options if all the normal means are unavailable.

In addition, the licensee states that two installed diesel-driven fire pumps and one motor-driven fire pump are available and can provide 1,500 gallons per minute makeup water from the facility intake via hard pipe or hose stations. In addition, the licensee 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.

Based on the above, the NRC staff finds that the planned SFP cooling and makeup water capability, with access to numerous sources of makeup inventory without requiring access to the refuel floor conforms to the capabilities assumed for the NRC staff analysis presented in NUREG-1738.

IDC #9: Procedures will be in place to control SFP operations that have the potential to rapidly decrease SFP inventory. These administrative controls may require additional operations or management review, management physical presence for designated operations or administrative limitations such as restrictions on heavy load movements.

Evaluation: The licensee states that the Palisades SFP design has no drains in the main fuel storage area of the pool. The licensee states that failure of the outlet piping would result in a loss of water only to the level of the outlet piping (located at 647 feet 6-inch elevation, 6 inches below skimmer), which would still maintain an adequate amount of water for shielding and cooling requirements. Failure of the inlet piping would result in a loss of water to the level of the inlet opening (located at 644 feet 5 inches elevation, 3 feet 7 inches below skimmer), which would also maintain an adequate water level in the SFP for shielding and cooling. The licensee states the top of the active fuel is located at the 624 feet elevation (24 feet below the skimmer).

The licensee states that the Palisades Permanently Defueled Technical Specifications requires that the SFP level be maintained \geq 647 feet elevation during movement of

irradiated fuel assemblies or a fuel cask in the SFP. The SFP level is allowed to be below the 647 feet elevation to support fuel cask movement if the displaced water level with the cask submerged raises SFP level to the ≥ 647 feet elevation.

Further, the licensee states that administrative limitations, such as restrictions on heavy loads movements, are controlled by Operating Requirements Manual Section 3.21. Palisades plant procedure FHS-M-23, "Movement of Heavy Loads in the SFP Area," which also controls heavy loads in the vicinity of the SFP, provides extensive instructions to ensure that the requirements of NUREG-0612 are met for heavy loads.

The licensee states that dry cask loading operations will have additional management oversight and additional administrative controls in place as a high integrated risk activity and an Infrequent Evolution Brief would also be held. Palisades procedure FHS-M-39B, "Fuel Loading and Dry Storage Cask (DSC) Sealing Operations for Dry Fuel Loading Operations," contains other numerous requirements to control dry cask loading operations.

These include, but are not limited to:

- SFP water level should be adjusted to 13-14 inches below the top of the skimmer plate in preparation for filling the DSC with SFP water (when filling DSC with pool water, SFP level will go down between 3 inches and 4 inches);
- Prior to cask loading, all required persons will have completed the training program for the Cask System per Palisades Administrative Procedure 5.26, "Independent Spent Fuel Storage Installation Training and Certification Program";
- The SFP water level shall be monitored hourly (via television monitor or locally) whenever the DSC is in the SFP, and fuel is in the DSC to ensure that the SFP is not overflowing and that the water level is not unintentionally rising; and
- With the DSC slightly suspended in the SFP, inspect lifting rig and load carrying members for any signs of overloading and distortion.

Palisades procedure FHS-M-34, "Unloading the Multi-Assembly Sealed Basket (MSB)," contains further requirements:

- Care must be taken to ensure the SFP-Impact Limiting Pad (ILP) will not be set on the SFP liner weld seams (setting on weld seams may cause fuel pool leakage);
- Use of an ILP in the SFP for setting the cask on; and
- Control Room communications established and verified prior to any lift in the SFP.

The licensee states that additional dry cask operations in the SFP are controlled under several other plant procedures. The licensee stated that the review of these procedures

confirm that there are no dry cask-related SFP operations which could result in a rapid drain down event.

Based on the above, the NRC staff finds that the described procedures are consistent with the administrative controls considered in the NRC staff analysis presented in NUREG-1738.

IDC #10: Routine testing of the alternative fuel pool makeup system components will be performed and administrative controls for equipment out of service will be implemented to provide added assurance that the components would be available, if needed.

Evaluation: The licensee states that Palisades practices align with this IDC. Discussion in IDC-8 above provides the methods to align makeup water sources to the SFP without requiring entry to the SFP floor (i.e., refuel floor). The licensee states that if access to the SFP floor is available, additional options exist, which are described in IDC-8. The licensee states that for the pumps identified in this section, preventative maintenance (PM) measures shall be in place to ensure that they will perform as required when placed in service. These PMs shall be implemented and scheduled in accordance with the PM Program. The licensee states Palisades procedures provide guidance for the conduct of operations, administrative processes, and specifies the authority and responsibilities of individuals to ensure the requirements of Federal regulations, industry good practices, and standards are met, including adherence to operating procedures. Performance of the procedures identified above will be in accordance with these requirements.

The NRC staff reviewed the information provided and finds that the described administrative controls conform to those considered in the NRC staff analysis presented in NUREG-1738.

SDA #1: Licensee's SFP cooling design will be at least as capable as that assumed in the risk assessment, including instrumentation. Licensees will have at least one motor-driven and one diesel-driven fire pump capable of delivering inventory to the SFP.

Evaluation: The licensee states that the Palisades SFP cooling system is as capable as that assumed in Section 3.0 of NUREG-1738. The licensee states that the Palisades SFP cooling system is a seismically analyzed system containing two motor-driven cooling pumps and two heat exchangers in series. The heat exchangers transfer decay heat to the Component Cooling Water system, then to the Ultimate Heat Sink. The licensee states that a filtration system is manually operated to maintain SFP cleanup. In addition, Palisades has two diesel-driven and one motor-driven pump in the fire water system and three motor-driven pumps in the service water system capable of delivering water inventory to the SFP.

Therefore, the NRC staff finds that the cooling and makeup capabilities, as described by the licensee in its application, are comparable to the capabilities considered in the NRC staff analysis presented in NUREG-1738.

SDA #2: Walk-downs of SFP systems will be performed at least once per shift by the operators. Procedures will be developed for and employed by the operators

to provide guidance on the capability and availability of onsite and offsite inventory makeup sources and time available to initiate these sources for various loss of cooling or inventory events.

Evaluation: The licensee states that currently, the staff performs walk-downs of the SFP system each shift as driven by operator rounds and by surveillance testing procedures. These include local and remote SFP level (both physical level and two redundant remote indicators), and SFP gate inner and outer nitrogen pressures. The licensee states that there are multiple methods to alert the control room of a SFP event, including alarms and redundant SFP water level indicators. The licensee states that walkdown of the SFP system remains in place following the permanent cessation of power operations. The licensee also states that Palisades procedures meet the requirements of this SDA by providing guidance on the capability and availability of permanent and portable makeup sources. AOP-38, "Acts of Nature," requires inspection of facility areas, including the SFP and dry spent fuel storage casks following a seismic event. The procedural direction for methods to diagnose the loss of cooling and/or inventory with description of steps, and sequences to establish make up to the SFP are discussed in IDC #8. This discussion also provides direction in a beyond design-basis external event.

Based on the above, the NRC staff finds that the monitoring of the SFP systems is consistent with the NRC staff analysis presented in NUREG-1738 based on the improvements in SFP monitoring capability and reliability implemented since the publication of NUREG-1738, specifically in response to the events at Fukushima Dai-ichi in 2011.

SDA #3: Control room instrumentation that monitors SFP temperature and water level will directly measure the parameters involved. Level instrumentation will provide alarms at levels associated with calling in offsite resources and with declaring an emergency.

Evaluation: The licensee states that Palisades Permanently Defueled Technical Specifications require that the SFP water level be maintained at or above 647 feet elevation. The licensee states the SFP level is monitored by a local level indicator (ruler), which provides indication in the control room via a camera/monitor. A control room low-level alarm at 646 feet is provided via Spent Fuel Pool Level Switch LS-0924. The licensee states that SFP temperature is monitored by temperature indicating alarms TIA-0925, "Spent Fuel Pool Temp Alarm Indicator," and TIA-0926, "Spent Fuel Pool Temp Alarm Indicator," located in the SFP area. Both TIA-0925 and TIA-0926 provide input to the PPC with workstations in the control room and include urgent PPC alarms at 140°F with audible annunciation as well as PPC warning alarms at 125°F. Additionally, temperature indicating alarm TIA-0917, Discharge From Spent Fuel Pool Heat Exchanger, also located in the SFP area provides an alarm at 115°F on the C-40 Panel in the Auxiliary Building which also results in an alarm in the control room. The licensee states that regarding the declaration of an emergency, the licensee will employ permanently defueled emergency action levels (EALs) using an NRC approved EAL Scheme, based on Appendix C of the NEI document NEI 99-01, "Development of Emergency Action Levels for Non-Passive Reactors," Revision 6 (Reference 58). Palisades currently has instrumentation in the SFP that meets the intent of this SDA.

Based on the above, the NRC staff finds that the SFP monitoring capability is consistent with the assumptions in the analysis presented in NUREG-1738.

SDA #4: The licensee determines that there are no drain paths in the SFP that could lower the pool level (by draining, suction, or pumping) more than 15 feet below the normal pool operating level and that licensee must initiate recovery using offsite sources.

Evaluation: The licensee states that there are no drain paths that could lower the SFP level by more than 15 feet below the normal SFP operating level. Suction and discharge piping for the SFP cooling system are greater than 20 feet above the top of the active fuel and approximately 3 feet below the normal level, such that a loss of 15 feet cannot occur.

The NRC staff reviewed the information provided and concludes that the SFP design protections against drainage are consistent with the assumptions used in the analysis presented in NUREG-1738.

SDA #5: Load drop consequence analysis will be performed for facilities with non-single, failure-proof systems. The analyses and any mitigative actions necessary to preclude catastrophic damage to the SFP that would lead to a rapid pool draining would be sufficient to demonstrate that there is high enough confidence in the facility's ability to withstand a heavy load drop.

Evaluation: The licensee states that the Palisades SFP design is in alignment with this SDA. The licensee states that heavy load lifts in and around the area of the SFP are performed by the L-3 crane. The licensee also states that the design of the L-3 crane is single-failure-proof as noted in the response to IDC#1. The licensee states that load drop consequence analyses have been performed, as previously described (in the response to IDC#1).

Based on the above, the NRC staff finds that Palisades' protection against heavy load drops is consistent with the assumptions considered in the analysis presented in NUREG-1738.

SDA #6: Each decommissioning plant will successfully complete the seismic checklist provided in Appendix 2B to NUREG-1738. If the checklist cannot be successfully completed, the decommissioning plant will perform a plant specific seismic risk assessment of the SFP and demonstrate that SFP seismically induced structural failure and rapid loss of inventory is less than the generic bounding estimates provided in NUREG-1738 ($<1 \times 10^5$ per year including non-seismic events).

Evaluation: The licensee of Palisades at the time, ENOI, conducted a seismic evaluation in response to an NRC letter to all power reactor licensees, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated November 27, 2012 (Reference 59). This evaluation provided an assessment of earthquake probabilities at potentially damaging. The NRC accepted the results of this assessment indicating that the low seismic hazard screening criteria had been satisfied at Palisades by letter dated March 4, 2014 (Reference 60).

The licensee conducted an evaluation to assess seismically induced structural failure and rapid loss of inventory. The assessment demonstrates that the risk of a SFP seismically induced structural failure and rapid loss of inventory is less than the generic bounding estimates provided in NUREG-1738 (1×10^{-5} per year including non-seismic events).

Therefore, the NRC staff finds that Palisades satisfies NUREG-1738 SDA #6.

SDA #7: Licensees will maintain a program to provide surveillance and monitoring of Boraflex in high-density spent fuel racks until such time as spent fuel is no longer stored in these high-density racks.

Evaluation: The licensee states that, in Amendment 207 dated February 26, 2002; (Reference 61), the NRC authorized Palisades to discontinue crediting Boraflex as a neutron absorber in their Region II spent fuel racks. With the removal of credit for Boraflex in the Criticality Safety Analysis (CSA), surveillances for Boraflex monitoring were discontinued. As there is no credit taken for Boraflex in the CSA, there is no need to resume surveillance testing during decommissioning. In a similar manner, for the one remaining Region I spent fuel rack utilizing Carborundum as its neutron absorber, the Carborundum material is no longer credited in the current CSA. Therefore, no surveillance of the neutron absorber is needed for this spent fuel rack.

The licensee also states that the remainder of the Region I Carborundum spent fuel racks were replaced with new racks containing Metamic as their neutron absorber in a re-rack project in 2013. A coupon monitoring surveillance program is utilized to ensure that the Metamic material does not degrade beyond limits. The licensee states this surveillance program will continue as long as there is fuel in the Region I spent fuel racks.

The NRC staff views Amendment 207 and the Palisades monitoring and surveillance program regarding metamict racks of equivalent rigor to SDA #7. Therefore, the NRC staff finds that the licensee satisfies NUREG-1738 SDA #7.

Based on the above evaluations, the NRC staff concludes that the design and operation of structures, systems, and components associated with SFP storage provide for safe storage of spent fuel and are consistent with the capabilities assumed in the analysis presented in NUREG-1738.

5.0 EXEMPTIONS

Pursuant to 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: (1) when the exemptions are authorized by law, will not present an undue risk to public health and safety, and are consistent with the common defense and security, and (2) when special circumstances are present. Special circumstances exist, in part, when application of the regulation in the particular circumstance would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule (10 CFR 50.12(a)(2)(ii)).

The underlying purpose of the planning standards in 10 CFR 50.47(b), the requirements in 10 CFR 50.47(c)(2), and certain requirements of Section IV of Appendix E to 10 CFR Part 50 are to ensure that there is reasonable assurance that adequate protective measures can and

will be taken in the event of a radiological emergency, and that licensees maintain effective offsite and onsite radiological emergency response plans. This section reflects the NRC staff's technical evaluation of the licensee's exemption requests, as provided to the Commission in SECY-23-0043, which was approved by the Commission in the SRM to SECY-23-0043. 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.

5.1 Specific Exemptions from 10 CFR 50.47

The licensee's letter dated July 11, 2022, requested exemptions from certain sections (as indicated by ~~strikeout~~ and **bolded** text) of 10 CFR 50.47 for Palisades.

5.1.1 10 CFR 50.47(b)

The onsite ~~and, except as provided in paragraph (d) of this section, offsite~~ emergency response plans for nuclear power reactors must meet the following standards:

The NRC requires a level of licensee EP commensurate with the potential consequences to public health and safety, and common defense and security at the licensee's site. The licensee's exemption request included radiological analyses to show that, as of 90 days after the permanent cessation of power operations, the radiological consequences of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs at the EAB. The licensee also performed an analysis which shows that, 12 months after the shutdown of Palisades, the spent fuel stored in the SFP will have decayed to the extent that in the unlikely event all cooling is lost to the spent fuel and a heat up under adiabatic conditions resulted, 10 hours would be available to take mitigative actions before the hottest fuel assembly reached 900°C.

NUREG-1738, and enhancements put into place as a result of the events of September 11, 2001, and the Fukushima Dai-ichi accident, support the NRC staff assumption that: only a highly unlikely, beyond-design-basis event (e.g., extreme earthquake or large aircraft impact) could result in an SFP fire. In addition, there would be a significant amount of time between the initiating event and the possible onset of conditions that could result in an SFP zirconium cladding fire. This time provides a substantial opportunity for event mitigation. Licensees are required to maintain effective strategies, sufficient resources, and adequately trained personnel to mitigate such an event. If State or local governmental officials determine that offsite protective actions are warranted, then sufficient time and capability would be available for ORO to implement these measures using a CEMP or "all-hazards" approach.

Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel, and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350,) are not considered necessary for a permanently shutdown and defueled nuclear power reactor.

Based on the above analysis, the NRC staff concludes that the exempted language from 10 CFR 50.47(b), above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.1.2 10 CFR 50.47(b)(1)

Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations ~~within the Emergency Planning Zones~~ have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.

NUREG-0396 provides that emergency response plans should be useful for responding to any accident that would produce offsite radiological doses in excess of the EPA early phase PAGs. Additionally, it introduced the concept of generic plume exposure pathway zones as a basis for the planning of response actions, which would result in dose savings in the environs of nuclear facilities in the event of a serious power reactor accident. As previously discussed, the licensee has provided radiological analyses, which show that as of 90 days after permanent cessation of power operations, the radiological consequences for the remaining applicable DBAs at Palisades will not exceed the limits of the EPA early phase PAGs at the EAB. In addition, reactor core melt (Class 9) scenarios, which were also considered in NUREG-0396, are no longer applicable to a permanently shutdown and defueled power reactor.

Considering the very low probability of beyond-design-basis events affecting SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, designated plume exposure and ingestion pathway EPZs are no longer needed.

In addition, in the SOC for the Final Rule for EP requirements for ISFSIs and monitored retrievable storage facilities (MRS) (60 FR 32430; June 22, 1995), the Commission responded to comments concerning EPZs for an ISFSI and MRS and concluded that “based on the potential inventory of radioactive material, potential driving forces for distributing that amount of radioactive material, and the probability of the initiation of these events, the Commission concludes that the offsite consequences of potential accidents at an ISFSI or a MRS would not warrant establishing Emergency Planning Zones.”

Based on the above analysis, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(1), above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.1.3 10 CFR 50.47(b)(3)

Arrangements for requesting and effectively using assistance resources have been made, ~~arrangements to accommodate State and local staff at the licensee’s Emergency Operations Facility have been made~~, and other organizations capable of augmenting the planned response have been identified.

With the termination of reactor power operations at Palisades and the permanent removal of the fuel from the reactor vessel to the SFP, most of the accident scenarios postulated for operating power reactors are no longer possible. The spent fuel will be stored in the Palisades SFP and ISFSI and will remain onsite until it can be moved offsite for long-term storage or disposal. The

reactor, reactor coolant system (RCS), and secondary systems are no longer in operation and have no function related to the storage of the spent fuel. Therefore, postulated accidents involving failure or malfunction of the reactor, RCS, or supporting systems are no longer applicable. During reactor decommissioning, the principal public safety concerns involve the radiological risks associated with the storage of spent fuel onsite.

The emergency operations facility (EOF) is a support facility for the purpose of managing overall licensee emergency response (including coordination with Federal, State, and local officials), coordination of radiological and environmental assessments, and determination of recommended public protective actions. Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, an EOF would not be needed to coordinate these types of assessments for determining public protective actions. Onsite staff will continue to maintain and provide for communication and coordination capabilities with offsite authorities for the purpose of notification and for the level of support required for the only remaining applicable DBAs and the prompt implementation of mitigative actions in response to an event affecting the SFP.

Based on the above analysis and the analysis provided in Section 5.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(3), above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.1.4 10 CFR 50.47(b)(4)

A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, ~~and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.~~

Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. The Palisades Permanently Defueled Emergency Plan will continue to maintain arrangements for requesting and using assistance resources from offsite support organizations. Therefore, initial offsite response measures are no longer required.

Based on the above analysis and the analysis provided in Section 5.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(4), above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.1.5 10 CFR 50.47(b)(5)

Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and follow-up messages to response organizations ~~and the public~~ has been established; ~~and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, a means to provide early notification and clear instruction to the populace within a designated plume exposure pathway EPZ is no longer required.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1 and 5.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(5), above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.1.6 10 CFR 50.47(b)(6)

Provisions exist for prompt communications among principal response organizations to emergency personnel ~~and to the public.~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, the requirement to provide prompt communication to the public within a designated plume exposure EPZ in regard to initial or predetermined protective actions is no longer needed.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1 and 5.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(6), above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.1.7 10 CFR 50.47(b)(7)

~~Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors),~~ [T]he principal points of contact with the news media for dissemination of information during an emergency ~~(including the physical location or locations)~~ are established in advance, and procedures for coordinated dissemination of information to the public are established.

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, the requirement to provide periodic information to the public within a designated plume exposure EPZ on how they will be notified and what their initial or predetermined protective actions should be in an emergency is not needed.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1 and 5.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(7), above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.1.8 10 CFR 50.47(b)(9)

Adequate methods, systems, and equipment for assessing and monitoring actual or potential ~~offsite~~ consequences of a radiological emergency condition are in use.

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, the requirement for assessing or monitoring offsite consequences beyond the EAB is not needed. The licensee maintains and operates the onsite monitoring systems needed to provide data that is essential for initiating emergency measures and performing accident assessment, including dose assessment and assessing the magnitude of a release.

Based on the above analysis and the analysis provided in Section 5.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(9), above, is not necessary to achieve the underlying purpose of this requirement as it applies to

Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.1.9 10 CFR 50.47(b)(10)

~~A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Evacuation time estimates have been developed by applicants and licensees. Licensees shall update the evacuation time estimates on a periodic basis. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.~~

The licensee's analysis demonstrated that, as of 90 days after the permanent cessation of power operations at Palisades, no credible events within the design basis would result in doses to the public that would exceed the EPA early phase PAGs at the EAB. Therefore, EPZs beyond the EAB and the associated protective actions developed from evacuation time estimates are no longer required. Additionally, in the unlikely event of an SFP accident, the iodine isotopes, which contribute to an offsite dose from an operating reactor power accident, are not present, so potassium iodide distribution would no longer serve as an effective or necessary supplemental protective action. As such, the NRC staff concludes that the licensee provides an acceptable level of EP at Palisades in its permanently shutdown and defueled condition, and also provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at Palisades.

Although formal offsite REP plans (in accordance with 44 CFR Part 350) have typically been exempted for decommissioning sites, OROs will continue to be relied upon for firefighting, law enforcement, ambulance, and medical services in support of the licensee's (onsite) emergency plan. The licensee is responsible for providing protective measures for any emergency workers responding onsite. Additionally, the licensee is responsible for control of activities within the EAB, including public access. The licensee actions necessary to protect the health and safety of members of the public who are in the EAB may include, but are not limited to, evacuation, sheltering, and decontamination in the unlikely event of a release of radioactive materials.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1 and 5.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(b)(10), above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.1.10 10 CFR 50.47(c)(2)

~~Generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. The exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as~~

~~demography, topography, land characteristics, access routes, and jurisdictional boundaries.~~ The size of the EPZs **also** may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized power level less than 250 MW thermal. ~~The plans for the ingestion pathway shall focus on such actions as are appropriate to protect the food ingestion pathway.~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP and with the time available to initiate mitigative actions consistent with plant conditions (i.e., between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, an EPZ is not required.

Section 50.47(c)(2) and footnote 1 to Appendix E to 10 CFR Part 50 both states, in part: "The size of the EPZs also may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized power level less than 250 MW [megawatts] thermal." This provision is not applicable to Palisades because it is not a gas-cooled reactor, and it has permanently ceased power operations. Therefore, no exemption is required.

Based on the above analysis and the analysis provided in Section 5.1.9 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR 50.47(c)(2), above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2 Specific Exemptions for 10 CFR Part 50, Appendix E, Section IV

The licensee's letter dated July 11, 2022, the licensee requested exemptions from certain sections (as indicated by strikeout and bolded text) of Appendix E to 10 CFR Part 50 for Palisades.

5.2.1 10 CFR Part 50, Appendix E, Section IV.1

The applicant's emergency plans shall contain, but not necessarily be limited to, information needed to demonstrate compliance with the elements set forth below, i.e., organization for coping with radiological emergencies, assessment actions, activation of emergency organization, notification procedures, emergency facilities and equipment, training, maintaining emergency preparedness, recovery, ~~and onsite protective actions during hostile action~~. In addition, the emergency response plans submitted by an applicant for a nuclear power reactor operating license under this part, or for an early site permit (as applicable) or combined license under 10 CFR part 52, shall contain information needed to demonstrate compliance with the standards described in § 50.47(b), and they will be evaluated against those standards.

After the terrorist attacks of September 11, 2001, the NRC evaluated the EP planning basis to ensure that it continued to protect the public health and safety in the current threat environment.

In 2002, the NRC issued Orders requiring compensatory measures, which include nuclear security and EP. The NRC staff determined that the EP planning basis continues to protect public health and safety; however, the NRC staff recognized that enhancements were desirable to ensure effective plan implementation during security-related events at nuclear power reactors (e.g., more timely NRC notification, additional onsite protective action considerations, and revision of EALs to identify security-related emergencies more succinctly).

The agency issued NRC Bulletin (BL) 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events," dated July 18, 2005 (Reference 62), to obtain information from licensees on progress in implementing security-event-related EP program enhancements. The 2011 EP Final Rule (76 FR 72560; November 23, 2011) made generically applicable the security-based response elements of NRC BL 2005-02. The enhancements of NRC BL 2005-02 were not applicable to holders of operating licenses for power reactors that had permanently ceased operations and had certified that fuel had been removed from the reactor vessel. Therefore, the requirement for onsite protective actions during hostile action is not necessary for Palisades.

Additionally, the NRC excluded non-power reactors from the definition of "hostile action" at the time of the 2011 EP Final Rule because, as defined in 10 CFR 50.2, "Definitions," a non-power reactor is not considered a nuclear power reactor and a regulatory basis had not been developed to support the inclusion of non-power reactors in the definition of "hostile action." Similarly, a decommissioning nuclear power reactor or ISFSI is not a "nuclear reactor" as defined in the NRC's regulations. Like a non-power reactor, a decommissioning power reactor also has a lower likelihood of a credible accident resulting in radiological releases requiring offsite protective measures than does an operating power reactor. For all of the above reasons, the NRC staff concludes that a decommissioning power reactor is not a facility that falls within the definition of "hostile action." However, although this analysis provides a justification for exempting Palisades from "hostile action" related requirements, some EP requirements for security-based events are maintained. The classification of security-based events, notification of offsite authorities, and coordination with offsite agencies are still required.

Based on the above analysis, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.1, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.2 10 CFR Part 50, Appendix E, Section IV.2

~~This nuclear power reactor license applicant shall also provide an analysis of the time required to evacuate various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations using the most recent U.S. Census Bureau data as of the date the applicant submits its application to the NRC.~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel

and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, the requirements for emergency planning zones and the associated evacuation time estimates (ETEs) are no longer required.

Based on the above analysis and the analysis provided in Section 5.1.9 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.2, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.3 10 CFR Part 50, Appendix E, Section IV.3

~~**Nuclear power reactor licensees shall use NRC approved evacuation time estimates (ETEs) and updates to the ETEs in the formulation of protective action recommendations and shall provide the ETEs and ETE updates to State and local governmental authorities for use in developing offsite protective action strategies.**~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Since formal offsite REP plans are not needed, the requirement to have an ETE and to perform an update to the ETE is not needed.

Based on the above analysis and the analysis provided in Section 5.2.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.3, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.4 10 CFR Part 50, Appendix E, Section IV.4

~~**Within 365 days of the later of the date of the availability of the most recent decennial census data from the U.S. Census Bureau or December 23, 2011, nuclear power reactor licensees shall develop an ETE analysis using this decennial data and submit it under § 50.4 to the NRC. These licensees shall submit this ETE analysis to the NRC at least 180 days before using it to form protective action recommendations and providing it to State and local governmental authorities for use in developing offsite protective action strategies.**~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis

events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Since formal offsite REP plans are not needed, the requirement to have an ETE and to perform an update to the ETE is not needed.

Based on the above analysis and the analysis provided in Section 5.2.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.4, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.5 10 CFR Part 50, Appendix E, Section IV.5

~~During the years between decennial censuses, nuclear power reactor licensees shall estimate EPZ permanent resident population changes once a year, but no later than 365 days from the date of the previous estimate, using the most recent U.S. Census Bureau annual resident population estimate and State/local government population data, if available. These licensees shall maintain these estimates so that they are available for NRC inspection during the period between decennial censuses and shall submit these estimates to the NRC with any updated ETE analysis.~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Since formal offsite REP plans are not needed, the requirement to have an ETE and to perform an update to the ETE is not needed.

Based on the above analysis and the analysis provided in Section 5.2.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.5, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.6 10 CFR Part 50, Appendix E, Section IV.6

~~If at any time during the decennial period, the EPZ permanent resident population increases such that it causes the longest ETE value for the 2-mile zone or 5-mile zone, including all affected Emergency Response Planning Areas, or for the entire 10-mile EPZ to increase by 25 percent or 30 minutes, whichever is less, from the nuclear power reactor licensee's currently NRC approved or updated ETE, the licensee shall update the ETE analysis to reflect the impact of that population increase. The licensee shall submit the updated ETE analysis to the NRC under § 50.4 no later than~~

~~365 days after the licensee's determination that the criteria for updating the ETE have been met and at least 180 days before using it to form protective action recommendations and providing it to State and local governmental authorities for use in developing offsite protective action strategies.~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Since formal offsite REP plans are not needed, the requirement to have an ETE and to perform an update to the ETE is not needed.

Based on the above analysis and the analysis provided in Section 5.2.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.6, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.7 10 CFR Part 50, Appendix E, Section IV.A.1

A description of the normal plant ~~operating~~ organization.

When the NRC docket the certifications of permanent cessation of operations and removal of fuel from the reactor vessel, the 10 CFR Part 50 license for Palisades no longer authorizes operation of the reactor, or emplacement or retention of fuel into the reactor vessel, as specified in 10 CFR 50.82(a)(2). Because the licensee will no longer be authorized to operate the reactor, Palisades does not have a plant "operating" organization. A description of the plant organization, as it relates to the requirements in Section IV.A.1 of Appendix E to 10 CFR Part 50 is still required.

Based on the above analysis, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.A.1, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.8 10 CFR Part 50, Appendix E, Section IV.A.3

~~A description, by position and function to be performed, of the licensee's headquarters personnel who will be sent to the plant site to augment the onsite emergency organization.~~

The number of staff at decommissioning power reactor site is smaller than that at an operating power reactor but is commensurate with the need to safely store spent fuel at the facility in a manner that is protective of public health and safety. The licensee furnished information concerning its SFP inventory makeup strategies that could be used in the event of a catastrophic loss of SFP water inventory and states that designated on-shift personnel are

trained to implement such strategies with equipment maintained onsite. The licensee has site personnel designated to respond within two hours of the declaration of an Alert classification level to assist the on-shift staff. As such, designation of specific licensee headquarters personnel is not necessary for the augmentation of the on-shift staffing and, therefore, is not described.

Based on the above analysis and the analysis provided in Section 5.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.A.3, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.9 10 CFR Part 50, Appendix E, Section IV.A.4

Identification, by position and function to be performed, of persons within the licensee organization who will be responsible for making ~~offsite~~ dose projections, and a description of how these projections will be made and the results transmitted to State and local authorities, NRC, and other appropriate governmental entities.

Palisades' exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. While it is unlikely that a beyond-DBA would result in doses in excess of the EPA early phase PAGs to the public beyond the EAB, the licensee still must be able to determine if a radiological release is occurring, thereby achieving the underlying purpose of this regulatory provision. If a release is occurring, then the licensee's staff should promptly communicate that information to offsite authorities for their consideration. The offsite authorities are responsible for deciding what, if any, protective actions should be taken that they consider appropriate to protect public health and safety.

Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, offsite dose projections are not required. The licensee will maintain the capability at Palisades determine if a radiological release is occurring and perform dose projections. If a release is occurring, the licensee will communicate release and dose projection information to offsite authorities for their consideration. The offsite organizations are responsible for deciding what, if any, protective actions should be taken.

Based on the above analysis and the analysis provided in Section 5.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.A.4, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.10 10 CFR Part 50, Appendix E, Section IV.A.5

~~Identification, by position and function to be performed, of other employees of the licensee with special qualifications for coping with emergency conditions that may arise. Other persons with special qualifications, such as consultants, who are not employees of the licensee and who may be called upon for assistance for emergencies shall also be identified. The special qualifications of these persons shall be described.~~

The number of licensee staff at a decommissioning nuclear power reactor site is smaller than that at an operating power reactor but is commensurate with the need to operate the facility and store spent fuel in a manner that is protective of public health and safety. The NRC staff considered the staffing levels at a permanently shutdown and defueled reactor and at an operating power reactor site. The spectrum of accidents at a decommissioning facility is greatly reduced and requires less specialized qualifications to address. The limited number of systems and equipment needed to maintain the spent fuel in a safe condition in the SFPs or in an ISFSI requires only minimal personnel, which is governed by the Palisades Technical Specifications.

The licensee furnished information concerning its SFP inventory makeup strategies that could be used in the event of a catastrophic loss of SFP water inventory and states that designated on-shift personnel are trained to implement such strategies with equipment maintained onsite. The licensee has site personnel designated to respond within two hours of the declaration of an Alert classification level to assist the on-shift staff. As such, additional employees or other persons with special qualifications are not anticipated.

Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, licensee and other personnel with special qualifications, as directed in 10 CFR Part 50, Appendix E, Section IV.A.5, are not required.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1 and 5.2.8 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.A.5, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.11 10 CFR Part 50, Appendix E, Section IV.A.7

~~By June 23, 2014, [I]dentification of, and a description of the assistance expected from appropriate State, local, and Federal agencies with responsibilities for coping with emergencies, including **hostile action at the site. For purposes of this appendix, "hostile action" is defined as** an act directed toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force.~~

In the 2011 EP Final Rule, the Commission defined a "hostile action" as, in part, "an act directed toward a nuclear power plant or its personnel." The 2011 EP Final Rule made generically

applicable the security-based response elements of NRC BL 2005-02. The enhancements of NRC BL 2005-02 were applicable to all holders of operating licenses for nuclear power reactors, except those who have permanently ceased operation and have certified that fuel has been permanently removed from the reactor vessel.

Because the NRC docketed the certifications of permanent cessation of operations and removal of fuel from the reactor vessels, the 10 CFR Part 50 license for Palisades no longer authorizes operation of the reactors, or emplacement or retention of fuel into the reactor vessels, as specified in 10 CFR 50.82(a)(2). Therefore, the enhancements for hostile actions required by the 2011 EP Final Rule are not applicable for Palisades in a permanently shutdown and defueled status.

Although the “hostile action” enhancements in the 2011 EP Final Rule are not applicable to a decommissioning power reactor, the licensee’s physical security plan must continue to provide high assurance against a potential security event impacting a designated target set. Therefore, some EP requirements for security-based events are maintained, such as the classification of security-based events, notification of offsite authorities, and coordination for the response of OROs (i.e., law enforcement, firefighting, medical assistance) onsite.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1 and 5.2.1 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.A.7, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.12 10 CFR Part 50, Appendix E, Section IV.A.8

~~Identification of the State and/or local officials responsible for planning for, ordering, and controlling appropriate protective actions, including evacuations when necessary.~~

The licensee’s exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFP and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the time before the onset of a postulated zirconium cladding fire), offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, identification of the State and/or local officials responsible for detailed preplanning for, and ordering appropriate protective actions, including evacuations, when necessary, is no longer required. If State or local governmental officials determine that offsite protective actions are warranted, then sufficient time and capability would be available for OROs to implement these measures using a CEMP or “all-hazards” approach.

Based on the above analysis, as well as and the analyses provided in Sections 5.1.1 and 5.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.A.8, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.13 10 CFR Part 50, Appendix E, Section IV.A.9

~~By December 24, 2012, for nuclear power reactor licensees, a detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the timely performance of their assigned functions as specified in the emergency plan.~~

The number of staff required at decommissioning sites is significantly reduced commensurate with the need to safely store spent fuel at the facility in a manner that is protective of public health and safety. The duties of the on-shift personnel at a decommissioning power reactor facility are not as complicated and diverse as those for an operating power reactor. The number of systems and equipment needed to maintain the spent fuel in a safe condition in the SFP or in the ISFSIs requires minimal personnel, which is governed by the Palisades Technical Specifications.

In the 2011 EP Final Rule, the NRC required nuclear power plant licensees to provide a detailed analysis to show that on-shift personnel assigned emergency plan implementation functions were not assigned any responsibilities that would prevent them from performing their assigned emergency plan functions in a timely manner. As part of the 2011 EP Final Rule, the NRC concluded that the staffing analysis requirement was not necessary for non-power reactor licensees due to the significantly smaller staffing levels required to operate the facility. Therefore, based on the similarities of non-power reactors and decommissioning reactors with regard to staffing, and as discussed in Section 5.2.1 of this safety evaluation, a detailed staffing analysis is not needed for a decommissioning reactor.

Based on the above analysis, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.A.9, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.14 10 CFR Part 50, Appendix E, Section IV.B.1

The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within ~~and outside~~ the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite ~~and offsite~~ monitoring. ~~By June 20, 2012, for nuclear power reactor licensees, these action levels must include hostile action that may adversely affect the nuclear power plant.~~ The initial emergency action levels shall be discussed and agreed on by the applicant or licensee and State and local governmental authorities, and approved by the NRC. Thereafter, emergency action levels shall be reviewed with the State and local governmental authorities on an annual basis.

NEI 99-01, Revision 6, is an acceptable method for development of an EAL scheme for non-passive operating nuclear power reactors, permanently defueled power reactors, and ISFSIs. Since a radiological release from any remaining applicable DBAs at Palisades is not estimated to exceed the limits of the EPA early phase PAGs beyond the EAB, event classification above the Alert classification level is no longer required, which is consistent with emergency planning exemptions granted by the NRC for previous decommissioning power reactors. The licensee will still be required to maintain EALs for the classification of security-based events to the Alert classification level, which was provided in the proposed Permanently Defueled Emergency Action Level Scheme, dated July 12, 2022 (Reference 63).

In the 2011 EP Final Rule, the Commission defined a “hostile action” as, in part, “an act directed toward a nuclear power plant or its personnel.” The 2011 EP Final Rule made generically applicable the security-based response elements of NRC BL 2005-02, which provided numerous enhancements to licensee emergency plans, including security-based EALs. The NRC staff is maintaining the requirement for security-based EALs at decommissioning power reactors as described by the 2002 NRC Orders requiring compensatory measures. Exemption from the NRC BL 2005-02 hostile action enhancements for decommissioning power reactors was previously discussed in Section 5.2.1 of this safety evaluation.

The licensee’s exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, a decommissioning reactor like Palisades is not required to have EALs to determine protective measures offsite. In addition, the licensee maintains and operates the onsite monitoring systems needed to provide data that is essential for initiating emergency measures and performing accident assessment, including dose assessment and assessing the magnitude of a radiological release, which would inform State or local governmental officials in making any determination that offsite protective actions are warranted.

Based on the above evaluation, as well as the analyses provided in Sections 5.1.1 and 5.2.1 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.B.1, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).
5.2.15 10 CFR Part 50, Appendix E, Section IV.C.1

The entire spectrum of emergency conditions that involve the alerting or activating of progressively larger segments of the total emergency organization shall be described. The communication steps to be taken to alert or activate emergency personnel under each class of emergency shall be described. Emergency action levels (based not only on onsite ~~and offsite~~ radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, ~~such as the pressure in containment and the response of the Emergency Core Cooling System~~) for notification of offsite agencies shall be described. The existence, but not the details, of a message authentication scheme shall be noted for such agencies. The emergency classes

defined shall include: (1) Notification of unusual events, (2) alert, ~~(3) site area emergency, and (4) general emergency~~. These classes are further discussed in NUREG-0654/FEMA-REP-1.

For a permanently shutdown and defueled power reactor, containment pressure and emergency core cooling system are no longer required. Therefore, they would have no parameters indicating a potential emergency. Other indications, such as SFP level, SFP temperature, and area radiation monitors indicate the conditions at Palisades.

In the SOC for the Final Rule for EP requirements for ISFSIs and MRS facilities, the Commission responded to comments concerning a General Emergency classification level at an ISFSI and MRS and concluded: "An essential element of a General Emergency is that [a] release can be reasonably expected to exceed EPA Protective Action Guidelines exposure levels off site for more than the immediate site area. As previously discussed, NRC studies have concluded that the maximum offsite dose would be less than 1 rem [roentgen equivalent man] which is within the EPA Protective Action Guides." The SOC further provides a response to comments concerning EPZs for an ISFSI and MRS and concluded that "based on the potential inventory of radioactive material, potential driving forces for distributing that amount of radioactive material, and the probability of the initiation of these events, the Commission concludes that the offsite consequences of potential accidents at an ISFSI or a MRS would not warrant establishing Emergency Planning Zones."

The licensee's exemption request provided radiological analyses to show that, as of 90 days after the permanent cessation of power operations, there are no remaining applicable DBAs that would reach the dose criteria for the declaration of a Site Area Emergency or a General Emergency. As discussed previously, the probability of a beyond-DBA condition that could reach emergency classifications of a Site Area Emergency or a General Emergency is very low. In the highly unlikely event of a beyond-DBA resulting in the loss of all cooling to the spent fuel stored in the SFP, as of 12 months after the permanent cessation of power operations at Palisades, it would take at least 10 hours from the time the fuel is uncovered until it reaches a temperature of 900°C. The licensee is required to maintain the capability to initiate prompt mitigative actions consistent with plant conditions. Considering the very low probability of beyond-design-basis events occurring that would affect SFP structural integrity, as well as the time available to initiate SFP mitigative measures before the onset of a postulated zirconium cladding fire, the need for an event classification level above an Alert is no longer required.

Based on the above analysis and the analysis provided in Section 5.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.C.1, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.16 10 CFR Part 50, Appendix E, Section IV.C.2

~~By June 20, 2012, nuclear power reactor~~ [L]icensees shall establish and maintain the capability to assess, classify, and declare an emergency condition ~~within 15 minutes~~ after the availability of indications to plant operators that an emergency action level has been exceeded and shall promptly declare the emergency condition as soon as possible following identification of the appropriate emergency classification level. Licensees shall not construe these criteria as a grace period to attempt to restore plant conditions to avoid declaring

an emergency action due to an emergency action level that has been exceeded. Licensees shall not construe these criteria as preventing implementation of response actions deemed by the licensee to be necessary to protect public health and safety provided that any delay in declaration does not deny the State and local authorities the opportunity to implement measures necessary to protect the public health and safety.

As part of the 2011 EP Final Rule, nuclear power reactor licensees were required to assess, classify, and declare an emergency condition within 15 minutes. Non-power reactors do not have the same potential to impact public health and safety as operating power reactors. As such, non-power reactor licensees are not required to establish or maintain complex offsite emergency response activities, nor to assess, classify, and declare an emergency condition within 15 minutes. Similarly, a decommissioning power reactor has a lower likelihood of a credible accident resulting in radiological releases requiring offsite protective measures than does an operating power reactor.

Unlike operating power reactor accident sequences potentially leading to large early releases, accident scenarios at decommissioning plants' SFPs evolve much more slowly and provide a longer time period to initiate SFP mitigative actions or, if deemed warranted by governmental officials, initiate appropriate offsite protective actions for the public. Because a decommissioning power reactor, like a non-power reactor, does not have the same potential radiological impact on public health and safety as an operating power reactor, the NRC staff concludes that it is not necessary for a decommissioning power reactor licensee to assess, classify, and declare an emergency condition within 15 minutes. The licensee proposed in its exemption request to assess, classify, and declare an emergency condition within 30 minutes. The NRC staff finds that 30 minutes to assess, classify, and declare an emergency condition is reasonable given the slower progression of a credible event resulting in a radiological release.

Based on the above analysis, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.C.2, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.17 10 CFR Part 50, Appendix E, Section IV.D.1

Administrative and physical means for notifying local, State, and Federal officials and agencies ~~and agreements reached with these officials and agencies for the prompt notification of the public and for public evacuation or other protective measures, should they become necessary,~~ shall be described. This description shall include identification ~~of the appropriate officials, by title and agency,~~ of the State and local government agencies ~~within the EPZs.~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled

nuclear power reactor. Therefore, the requirements for prompt notification of the public and maintenance of emergency planning zones are not needed.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1, 5.1.2, and 5.1.5 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.D.1, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.18 10 CFR Part 50, Appendix E, Section IV.D.2

~~Provisions shall be described for yearly dissemination to the public within the plume exposure pathway EPZ of basic emergency planning information, such as the methods and times required for public notification and the protective actions planned if an accident occurs, general information as to the nature and effects of radiation, and a listing of local broadcast stations that will be used for dissemination of information during an emergency. Signs or other measures shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an accident occurs.~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, the requirements for dissemination of emergency planning information to the public and maintenance of emergency planning zones are not needed.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1, 5.1.2, and 5.1.5 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.D.2, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.19 10 CFR Part 50, Appendix E, Section IV.D.3

~~A licensee shall have the capability to notify responsible State and local governmental agencies **within 15 minutes** after declaring an emergency. **The licensee shall demonstrate that the appropriate governmental authorities have the capability to make a public alerting and notification decision promptly on being informed by the licensee of an emergency condition. Prior to initial operation greater than 5 percent of rated thermal power of the first reactor at the site, each nuclear power reactor licensee shall demonstrate that administrative and physical means have been established for alerting and providing prompt instructions to the public with the plume**~~

~~exposure pathway EPZ. The design objective of the prompt public alert and notification system shall be to have the capability to essentially complete the initial alerting and notification of the public within the plume exposure pathway EPZ within about 15 minutes. The use of this alerting and notification capability will range from immediate alerting and notification of the public (within 15 minutes of the time that State and local officials are notified that a situation exists requiring urgent action) to the more likely events where there is substantial time available for the appropriate governmental authorities to make a judgment whether or not to activate the public alert and notification system. The alerting and notification capability shall additionally include administrative and physical means for a backup method of public alerting and notification capable of being used in the event the primary method of alerting and notification is unavailable during an emergency to alert or notify all or portions of the plume exposure pathway EPZ population. The backup method shall have the capability to alert and notify the public within the plume exposure pathway EPZ, but does not need to meet the 15 minute design objective for the primary prompt public alert and notification system. When there is a decision to activate the alert and notification system, the appropriate governmental authorities will determine whether to activate the entire alert and notification system simultaneously or in a graduated or staged manner. The responsibility for activating such a public alert and notification system shall remain with the appropriate governmental authorities.~~

In the permanently shutdown and defueled condition of a decommissioning power reactor, the rapidly developing accident scenarios associated with events initiated during reactor power operations are no longer credible. The slow progression of SFP events allows greater time for the licensee to successfully mitigate the accidents and, if deemed warranted by governmental officials or other offsite authorities, to implement appropriate offsite protective measures using a CEMP or "all-hazards" approach.

In the SOC for the Final Rule for EP requirements for ISFSIs and MRS facilities, the Commission responded to comments concerning a notification time of 15 minutes, and concluded that, "[t]he Commission has established a reasonable time limit for notification which has proven to be adequate in the past. 'The licensee shall also commit to notify the NRC Operations Center immediately after notifications of the appropriate offsite response organizations and not later than one hour after the licensee declares an emergency.'" The licensee proposed in its exemption request to complete emergency notifications within 60 minutes after an emergency declaration or a change in emergency classification level. The 60-minute notification timeliness is consistent with the notification time requirements for emergency plans based on the requirements in 10 CFR 50.72(a)(3).

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. The NRC's research and analysis shows that a decommissioning power reactor licensee would have sufficient time to implement mitigation measures consistent with plant conditions and, if deemed warranted, for OROs to initiate protective actions offsite. The NRC staff concludes that notifying OROs as soon as possible, and within 60 minutes, would not significantly impact the time available for OROs to initiate appropriate response actions.

Decommissioning-related EP submittals for Palisades have been discussed with cognizant OROs. These meetings have included discussion of the regulatory exemption requests. These discussions have addressed the changes to onsite and offsite emergency preparedness throughout the decommissioning process, including the proposed 30-minute declaration time and 60-minute notification time. Emergency management officials have not objected to the proposed changes. Based on the above analysis, the NRC staff agrees that 60 minutes to notify the OROs of an emergency condition is reasonable. Additionally, the NRC staff agrees that the requirements for prompt notification of the public and an EPZ are not needed.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1 and 5.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.D.3, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.20 10 CFR Part 50, Appendix E, Section IV.D.4

~~**If FEMA has approved a nuclear power reactor site's alert and notification design report, including the backup alert and notification capability, as of December 23, 2011, then the backup alert and notification capability requirements in Section IV.D.3 must be implemented by December 24, 2012. If the alert and notification design report does not include a backup alert and notification capability or needs revision to ensure adequate backup alert and notification capability, then a revision of the alert and notification design report must be submitted to FEMA for review by June 24, 2013, and the FEMA-approved backup alert and notification means must be implemented within 365 days after FEMA approval. However, the total time period to implement a FEMA-approved backup alert and notification means must not exceed June 22, 2015.**~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance

with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, the requirements for prompt notification of the public and an EPZ, including backup alert and notification capabilities, are not needed.

Based on the above analysis and the analysis provided in Section 5.2.19 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.D.4, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.21 10 CFR Part 50, Appendix E, Section IV.E.8.a.(i)

A licensee ~~onsite technical support center and an emergency operations~~ facility from which effective direction can be given and effective control can be exercised during an emergency;

The guidance in NUREG-0696, "Functional Criteria for Emergency Response Facilities," dated February 1981 (Reference 64), provides that the technical support center (TSC) is an onsite facility located close to the control room that provides plant management and technical support to the reactor operating personnel located in the control room during emergency conditions. For a permanently shutdown power reactor facility, onsite actions may be directed from the control room or other onsite location, without the requirements imposed on a TSC.

In addition, as there are no remaining applicable DBAs that would exceed the EPA early phase PAGs at the EAB, and there would be time available to initiate mitigative actions consistent with plant conditions between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire, an EOF would not be required to support interface with offsite agencies. If needed, coordination with offsite authorities and response organizations can occur from the control room or another onsite location. In addition, due to the reduced size of on-shift and emergency response organization (ERO) staff for a permanently shutdown and defueled power reactor, separate facilities to accommodate emergency response staff are no longer required. As such, greater efficiency and coordination is gained by locating staff in a central onsite facility.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1 and 5.1.3 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.E.8.a.(i), above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.22 10 CFR Part 50, Appendix E, Section IV.E.8.a.(ii)

~~For nuclear power reactor licensees, a licensee onsite operational support center;~~

The operations support center (OSC) is an onsite area separate from the control room and the TSC where licensee operations support personnel will assemble in an emergency. The OSC should provide a location where plant logistic support can be coordinated during an emergency and restrict control room access to those support personnel specifically requested by the shift supervisor. With the permanently shutdown and defueled status of Palisades and the storage of

the spent nuclear fuel in the SFP and ISFSI, an OSC will no longer be required to meet its original purpose during an emergency or support initial SFP mitigation actions if needed. The licensee states that an onsite facility will continue to be maintained, from which effective direction can be given and effective control may be exercised during an emergency.

Given the permanently shutdown and defueled status of the Palisades reactor and storage of the spent fuel in the SFP and ISFSI, an OSC will no longer be required to meet its original purpose during an emergency or to support initial SFP mitigation actions if needed. When activated, the ERO reports to the Emergency Director to assist the on-shift staff in the assessment, mitigation, and response to an emergency, as well as to support the dispatch of emergency teams. Due to the reduced size of on-shift and ERO staff for a permanently shutdown and defueled power reactor, separate facilities to accommodate emergency response staff are no longer required. As such, greater efficiency and coordination is gained by locating staff in a central onsite facility. An onsite facility will continue to be maintained at Palisades, from which effective direction can be given and effective control may be exercised during an emergency.

Based on the above analysis and the analysis provided in Section 5.2.21 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.A.8.a.(ii), above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.23 10 CFR Part 50, Appendix E, Section IV.E.8.b

~~For a nuclear power reactor licensee's emergency operations facility required by paragraph 8.a of this section, either a facility located between 10 miles and 25 miles of the nuclear power reactor site(s), or a primary facility located less than 10 miles from the nuclear power reactor site(s) and a backup facility located between 10 miles and 25 miles of the nuclear power reactor site(s). An emergency operations facility may serve more than one nuclear power reactor site. A licensee desiring to locate an emergency operations facility more than 25 miles from a nuclear power reactor site shall request prior Commission approval by submitting an application for an amendment to its license. For an emergency operations facility located more than 25 miles from a nuclear power reactor site, provisions must be made for locating NRC and offsite responders closer to the nuclear power reactor site so that NRC and offsite responders can interact face-to-face with emergency response personnel entering and leaving the nuclear power reactor site. Provisions for locating NRC and offsite responders closer to a nuclear power reactor site that is more than 25 miles from the emergency operations facility must include the following:~~

- ~~(1) Space for members of an NRC site team and Federal, State, and local responders;~~
- ~~(2) Additional space for conducting briefings with emergency response personnel;~~
- ~~(3) Communication with other licensee and offsite emergency response facilities;~~

~~(4) — Access to plant data and radiological information; and~~

~~(5) — Access to copying equipment and office supplies;~~

Based on the analyses provided in Sections 5.1.1, 5.1.3, and 5.2.21 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.E.8.b, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.24 10 CFR Part 50, Appendix E, Section IV.E.8.c

~~By June 20, 2012, for a nuclear power reactor licensee's emergency operations facility required by paragraph 8.a of this section, a facility having the following capabilities:~~

~~(1) — The capability for obtaining and displaying plant data and radiological information for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves;~~

~~(2) — The capability to analyze plant technical information and provide technical briefings on event conditions and prognosis to licensee and offsite response organizations for each reactor at a nuclear power reactor site and for each nuclear power reactor site that the facility serves; and~~

~~(3) — The capability to support response to events occurring simultaneously at more than one nuclear power reactor site if the emergency operations facility serves more than one site; and~~

Based on the analyses provided in Sections 5.1.1, 5.1.3, and 5.2.21 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.E.8.c, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.25 10 CFR Part 50, Appendix E, Section IV.E.8.d

~~For nuclear power reactor licensees, an alternative facility (or facilities) that would be accessible even if the site is under threat of or experiencing hostile action, to function as a staging area for augmentation of emergency response staff and collectively having the following characteristics: the capability for communication with the emergency operations facility, control room, and plant security; the capability to perform offsite notifications; and the capability for engineering assessment activities, including damage control team planning and preparation, for use when onsite emergency facilities cannot be safely accessed during hostile action. The requirements in this paragraph 8.d must be implemented no later than December 23, 2014, with the exception of the capability for staging emergency response organization personnel at the alternative facility (or facilities) and the capability for communications with the~~

~~emergency operations facility, control room, and plant security, which must be implemented no later than June 20, 2012.~~

Based on the analyses provided in Sections 5.1.1, 5.2.1, and 5.2.11 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.E.8.d, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.26 10 CFR Part 50, Appendix E, Section IV.E.8.e

~~A licensee shall not be subject to the requirements of paragraph 8.b of this section for an existing emergency operations facility approved as of December 23, 2011;~~

Based on the analyses provided in Sections 5.1.1, 5.1.3, and 5.2.21 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.E.8.e, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.27 10 CFR Part 50, Appendix E, Section IV.E.9.a

Provision for communications with contiguous State/local governments ~~within the plume exposure pathway EPZ~~. Such communications shall be tested monthly.

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, provisions for communications with contiguous State/local governments within the plume exposure pathway EPZ are not needed. The licensee proposed in its exemption request to continue to complete emergency notifications to designated State/local governments contiguous to the site within 60 minutes after an emergency declaration or a change in emergency classification level. Specifically, State of Michigan and Van Buren County. Because EPZs would be eliminated, Palisades would no longer describe provisions to communicate with Berrien and Allegan County. The onsite response facilities will be combined into a single facility, as described in the basis for Appendix E to 10 CFR Part 50, Section IV.E.8.a(i). A description of the communications systems and the testing frequencies is included in the Palisades Permanently Defueled Emergency Plan.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1 and 5.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.E.9.a, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent

cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.28 10 CFR Part 50, Appendix E, Section IV.E.9.c

~~Provision for communications among the nuclear power reactor control room, the onsite technical support center, and the emergency operations facility, and among the nuclear facility, the principal State and local emergency operations centers, and the field assessment teams. Such communications systems shall be tested annually.~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, as discussed in Sections 5.2.21 and 5.2.22 of this safety evaluation, there is no need for a TSC, EOF, or offsite field assessment teams to meet the underlying purpose of the rule. With the elimination of the requirements for a TSC, EOF, and the field assessment teams, performing annual testing of communication among them is no longer required. Communications with State and local governments will be through the commercial phone system. Due to its frequency of use, additional testing of that system is not necessary.

Based on the above analysis, as well as the analyses provided in Sections 5.2.21 and 5.2.22 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.E.9.c, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.29 10 CFR Part 50, Appendix E, Section IV.E.9.d

~~Provisions for communications by the licensee with NRC Headquarters and the appropriate NRC Regional Office Operations Center from the nuclear power reactor control room, the onsite technical support center, and the near-site emergency operations facility. Such communications shall be tested monthly.~~

As discussed in Sections 5.2.21 and 5.2.22 of this safety evaluation, the need for a separate TSC and EOF no longer exists, given the smaller facility staffing and the greatly reduced required interaction with State and local emergency response facilities. The NRC staff concludes that the emergency functions of the control room, EOF, TSC, and OSC may be combined into one or more locations. As a result, communications between the EOF and TSC, and the NRC, as well as monthly testing of these capabilities, are no longer needed. The Emergency Notification System used to communicate with the NRC will be tested monthly.

Based on the above analysis, as well as the analyses provided in Sections 5.2.21 and 5.2.22 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.E.9.d, above, is not necessary to achieve the

underlying purpose of this requirement as it applies to Palisades 12 months after permanent operations of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.30 10 CFR Part 50, Appendix E, Section IV.F.1

The program to provide for: (a) The training of employees and exercising, by periodic drills, of radiation emergency plans to ensure that employees of the licensee are familiar with their specific emergency response duties, and (b) the participation in the training and drills by other persons whose assistance may be needed in the event of a radiation emergency shall be described. This shall include a description of specialized initial training and periodic retraining programs to be provided to each of the following categories of emergency personnel:

- i. Directors and/or coordinators of the plant emergency organization;
- ii. Personnel responsible for accident assessment, including control room shift personnel;
- iii. Radiological monitoring teams;
- iv. Fire control teams (fire brigades);
- v. Repair and damage control teams;
- vi. First aid and rescue teams;
- vii. Medical support personnel;
- ~~viii. Licensee's headquarters support personnel;~~
- ix. Security personnel.

In addition, a radiological orientation training program shall be made available to local services personnel; e.g., local emergency services/~~Civil Defense~~, local law enforcement personnel, ~~local news media persons~~.

The number of staff required at decommissioning sites is generally small but is commensurate with the need to safely store spent fuel at the facility in a manner that is protective of public health and safety. Decommissioning power reactors typically have a level of emergency response that does not require additional support by licensee headquarters personnel. The licensee will maintain a level of emergency response that does not require additional response by headquarters personnel. The on-shift and emergency response positions are defined in the Palisades Permanently Defueled Emergency Plan and will be regularly tested through drills and exercises, audited, and inspected by the licensee and the NRC. Due to the low probability of DBA or other credible events to exceed the EPA early phase PAGs, offsite emergency measures are limited to support provided by local police, fire departments, and ambulance and hospital services, as appropriate. Local news media personnel no longer need radiological orientation training since they will not be called upon to support the formal Joint Information Center. Therefore, the NRC staff considers exempting a licensee's headquarters personnel from the decommissioning site-specific emergency response training requirements to be reasonable. Training for licensee personnel responding from company locations offsite will still be required based on the ERO positions specified above.

"Civil Defense" is an outdated term that is no longer used. This category of offsite responders, which could be expected to respond onsite, is captured under "local emergency services" and "local law enforcement." Local news media are not included in the category of local services

personnel requiring periodic radiological orientation training for the facility since they will not be called upon to support a formal joint information center (JIC).

Based on the above analysis, as well as the analyses provided in Sections 5.1.1 and 5.2.8 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.F.1, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.31 10 CFR Part 50, Appendix E, Section IV.F.2

The plan shall describe provisions for the conduct of emergency preparedness exercises as follows: Exercises shall test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communications networks, ~~test the public alert and notification system~~, and ensure that emergency organization personnel are familiar with their duties.

Based on the analyses provided in Sections 5.1.1 and 5.2.19 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.F.2, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.32 10 CFR Part 50, Appendix E, Section IV.F.2.a

~~A full participation exercise which tests as much of the licensee, State, and local emergency plans as is reasonably achievable without mandatory public participation shall be conducted for each site at which a power reactor is located. Nuclear power reactor licensees shall submit exercise scenarios under § 50.4 at least 60 days before use in a full participation exercise required by this paragraph 2.a.~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, conducting a full participation exercise with State and local agencies is not needed for a decommissioning power reactor site.

Based on above analysis and the analysis provided in Section 5.1.1 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.F.2.a, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.33 10 CFR Part 50, Appendix E, Section IV.F.2.b

Each licensee at each site shall conduct a subsequent exercise of its onsite emergency plan every 2 years. ~~Nuclear power reactor licensees shall submit exercise scenarios under § 50.4 at least 60 days before use in an exercise required by this paragraph 2.b. The exercise may be included in the full participation biennial exercise required by paragraph 2.c. of this section.~~ In addition, the licensee shall take actions necessary to ensure that adequate emergency response capabilities are maintained during the interval between biennial exercises by conducting drills, including at least one drill involving a combination of some of the principal functional areas of the licensee's onsite emergency response capabilities. The principal functional areas of emergency response include activities such as management and coordination of emergency response, accident assessment, event classification, notification of offsite authorities, assessment of the onsite ~~and offsite~~ impact of radiological releases, ~~protective action recommendation development, protective action decision-making, plant~~ system repair and mitigative action implementation. During these drills, activation of all of the licensee's emergency response facilities ~~(Technical Support Center (TSC), Operations Support Center (OSC), and the Emergency Operations Facility (EOF))~~ would not be necessary, licensees would have the opportunity to consider accident management strategies, supervised instruction would be permitted, operating staff in all participating facilities would have the opportunity to resolve problems (success paths) rather than have controllers intervene, and the drills may focus on the onsite exercise training objectives.

The intent of submitting emergency exercise scenarios in advance at an operating power reactor site is to ensure that licensees utilize different scenarios in order to prevent the preconditioning of responders at operating power reactors. For decommissioning power reactor sites, there are limited event scenarios that could occur, and as such, the submittal of exercise scenarios for the purpose of ensuring that responders do not get preconditioned to certain scenarios is not necessary to achieve the underlying purpose of the rule.

Palisades will continue to conduct biennial emergency response exercises and will invite the State of Michigan and local support organizations (firefighting, law enforcement, and ambulance and medical services) to participate in periodic drills and exercises to assess their ability to perform responsibilities related to an emergency at the site to the extent defined by the Palisades Permanently Defueled Emergency Plan.

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, drills involving principle functional areas associated with offsite REP are not needed. As discussed previously in Sections 5.2.21 and 5.2.22 of this safety evaluation, there is no need for an OSC, TSC, or EOF to meet the underlying purpose of the rule.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1, 5.2.21, 5.2.22, and 5.2.32 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.F.2.b, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.34 10 CFR Part 50, Appendix E, Section IV.F.2.c

~~Offsite plans for each site shall be exercised biennially with full participation by each offsite authority having a role under the radiological response plan. Where the offsite authority has a role under a radiological response plan for more than one site, it shall fully participate in one exercise every two years and shall, at least, partially participate in other offsite plan exercises in this period. If two different licensees each have licensed facilities located either on the same site or on adjacent, contiguous sites, and share most of the elements defining co-located licensees, then each licensee shall:~~

- ~~(1) — Conduct an exercise biennially of its onsite emergency plan;~~
- ~~(2) — Participate quadrennially in an offsite biennial full or partial participation exercise;~~
- ~~(3) — Conduct emergency preparedness activities and interactions in the years between its participation in the offsite full or partial participation exercise with offsite authorities, to test and maintain interface among the affected State and local authorities and the licensee. Co-located licensees shall also participate in emergency preparedness activities and interaction with offsite authorities for the period between exercises;~~
- ~~(4) — Conduct a hostile action exercise of its onsite emergency plan in each exercise cycle; and~~
- ~~(5) — Participate in an offsite biennial full or partial participation hostile action exercise in alternating exercise cycles.~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, conducting a full participation exercise with State and local agencies is not needed for a decommissioning power reactor site.

Based on the above analysis, as well as the analyses provided in Sections 5.2.1 and 5.2.32 of this safety evaluation, the NRC staff concludes that the exempted language from

10 CFR Part 50, Appendix E, Section IV.F.2.c, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.35 10 CFR Part 50, Appendix E, Section IV.F.2.d

~~Each State with responsibility for nuclear power reactor emergency preparedness should fully participate in the ingestion pathway portion of exercises at least once every exercise cycle. In States with more than one nuclear power reactor plume exposure pathway EPZ, the State should rotate this participation from site to site. Each State with responsibility for nuclear power reactor emergency preparedness should fully participate in a hostile action exercise at least once every cycle and should fully participate in one hostile action exercise by December 31, 2015. States with more than one nuclear power reactor plume exposure pathway EPZ should rotate this participation from site to site.~~

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, the requirement to ensure the State fully participate in the ingestion pathway portion of an exercise is not needed. As noted in Section 5.1.2 of this safety evaluation, designated plume exposure and ingestion pathway EPZs are no longer needed.

Additionally, the NRC excluded non-power reactors from the definition of "hostile action" at the time of the 2011 EP Final Rule because, as defined in 10 CFR 50.2, a non-power reactor is not considered a nuclear power reactor and a regulatory basis had not been developed to support the inclusion of non-power reactors in the definition of "hostile action." Similarly, a decommissioning nuclear power reactor or ISFSI is not a "nuclear reactor" as defined in the NRC's regulations. Like a non-power reactor, a decommissioning nuclear power reactor also has a lower likelihood of a credible accident resulting in radiological releases requiring offsite protective measures than does an operating nuclear power reactor. For all the above reasons, the NRC staff concludes that a decommissioning nuclear power reactor is not a facility that falls within the definition of "hostile action."

Based on the above analysis, as well as the analyses provided in Sections 5.1.1, 5.1.2, 5.2.1, and 5.2.32 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.F.2.d, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.36 10 CFR Part 50, Appendix E, Section IV.F.2.e

Licensees shall enable any State or local Government ~~located within the plume exposure pathway EPZ~~ to participate in the licensee's drills when requested by such State or local Government.

The licensee's exemption request provided radiological analyses to show that, as of 90 days after permanent cessation of power operations at Palisades, the radiological consequences to the public of the only remaining applicable DBAs would not exceed the limits of the EPA early phase PAGs beyond the EAB. Considering the very low probability of beyond-design-basis events affecting the SFPs and the time available to initiate mitigative actions consistent with plant conditions (i.e., the time between the loss of both water and air cooling to the spent fuel and the onset of a postulated zirconium cladding fire), formal offsite REP plans (in accordance with 44 CFR Part 350) are not considered necessary for a permanently shutdown and defueled nuclear power reactor. Therefore, identifying State and local governments in relation to a plume exposure pathway EPZ that is no longer required is not needed. Palisades will continue to conduct biennial emergency response exercises and will invite the State of Michigan and local support organizations (firefighting, law enforcement, and ambulance and medical services) to participate in periodic drills and exercises to assess their ability to perform responsibilities related to an emergency at the site to the extent defined by the Permanently Defueled Emergency Plan.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1 and 5.1.2 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.F.2.e, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.37 10 CFR Part 50, Appendix E, Section IV.F.2.f

Remedial exercises will be required if the emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, ~~in consultation with FEMA,~~ cannot (1) find reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency or (2) determine that the ERO has maintained key skills specific to emergency response. ~~The extent of State and local participation in remedial exercises must be sufficient to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercises.~~

As discussed previously in Section 5.2.32 of this safety evaluation, the requirement to conduct a full participation exercise with State and local agencies is not needed. Since full participation emergency plan exercises are not required, and FEMA does not have responsibilities related to onsite emergency preparedness, NRC consultation with FEMA is no longer necessary.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1 and 5.2.32 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.F.2.f, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.38 10 CFR Part 50, Appendix E, Section IV.F.2.i

Licensees shall use drill and exercise scenarios that provide reasonable assurance that anticipatory responses will not result from preconditioning of participants. ~~Such scenarios for nuclear power reactor licensees must include a wide spectrum of radiological releases and events, including hostile action.~~ Exercise and drill scenarios as appropriate must emphasize coordination among onsite and offsite response organizations.

The NRC staff previously evaluated the issues surrounding preconditioning for emergency drill scenarios, including hostile action scenarios, at decommissioning power reactors in Sections 5.2.1, 5.2.33, and 5.2.34 of this safety evaluation. In each instance, the NRC staff concluded that the exempted language from 10 CFR Part 50, Appendix E, Section IV.F.2.i, above, was not needed to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.39 10 CFR Part 50, Appendix E, Section IV.F.2.j

~~(i) The exercises conducted under paragraph 2 of this section by nuclear power reactor licensees must provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to implement the principal functional areas of emergency response identified in paragraph 2.b of this section.~~

~~(ii) Each exercise must provide the opportunity for the ERO to demonstrate key skills specific to emergency response duties in the control room, TSC, OSC, EOF, and joint information center.~~

~~(iii) In each 8-calendar-year exercise cycle, nuclear power reactor licensees shall vary the content of scenarios during exercises conducted under paragraph 2 of this section to provide the opportunity for the ERO to demonstrate proficiency in the key skills necessary to respond to the following scenario elements:~~

~~(1) Hostile action directed at the plant site;~~

~~(2) No radiological release or an unplanned minimal radiological release that does not require public protective actions;~~

~~(3) An initial classification of, or rapid escalation to, a Site Area Emergency or General Emergency;~~

~~(4) Implementation of strategies, procedures, and guidance under § 50.155(b)(2); and~~

~~(5) Integration of offsite resources with onsite response.~~

~~(iv) The licensee shall maintain a record of exercises conducted during each 8-year exercise cycle that documents the content of scenarios used to comply with the requirements of section IV.F.2.j of this appendix.~~

~~(v) Each licensee shall conduct a hostile action exercise for each of its sites no later than December 31, 2015.~~

~~(vi) The first 8-year exercise cycle for a site will begin in the calendar year in which the first hostile action exercise is conducted. For a site licensed under 10 CFR part 52, the first 8-year exercise cycle begins in the calendar year of the initial exercise required by section IV.F.2.a of this appendix.~~

In the SOC for the 2011 EP Final Rule, the NRC discussed the addition of a new Section IV.F.2.j to Appendix E of 10 CFR Part 50, which requires all operating nuclear power reactor licensees to provide an opportunity for the ERO to demonstrate proficiency in response to a wide spectrum of scenarios, including a “hostile action” and a loss of large areas of the plant due to fire or explosion. The NRC staff previously evaluated the need for hostile action enhancements at decommissioning power reactors in Section 5.2.1 of this safety evaluation. Section IV.F.2.j of Appendix E to 10 CFR Part 50 further provides that the ERO must demonstrate key skills specific to emergency response duties in the reactor control room, TSC, OSC, EOF, and JIC. The NRC staff previously concluded that the functions of the Palisades control room, EOF, TSC, and OSC may be combined into one or more locations in Sections 5.2.21, 5.2.22, and 5.2.29 of this safety evaluation. A dedicated JIC is also not needed based on the analysis in Section 5.2.30 of this safety evaluation. At a decommissioning site, where only the SFPs and their related support systems, structures, and components remain, there are no other facilities in which ERO personnel could demonstrate proficiency.

Based on the above analysis, as well as the analyses provided in Sections 5.1.1, 5.2.1, 5.2.30, and 5.2.33 of this safety evaluation, the NRC staff concludes that the exempted language from 10 CFR Part 50, Appendix E, Section IV.F.2.j, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

5.2.40 10 CFR Part 50, Appendix E, Section IV.I

~~By June 20, 2012, for nuclear power reactor licensees, a range of protective actions to protect onsite personnel during hostile action must be developed to ensure the continued ability of the licensee to safely shutdown the reactor and perform the functions of the licensee’s emergency plan.~~

Based on the analysis provided in Section 5.2.1 of this safety evaluation, the NRC staff concludes that the enhancements for hostile actions, as required by the 2011 EP Final Rule, are not necessary for Palisades given its permanently shutdown and defueled status. Therefore, the exempted language from 10 CFR Part 50, Appendix E, Section IV.I, above, is not necessary to achieve the underlying purpose of this requirement as it applies to Palisades 12 months after permanent cessation of power operations and, therefore, meets the special circumstances provisions of 10 CFR 50.12(a)(2)(ii).

6.0 ENVIRONMENTAL CONSIDERATIONS

In accordance with 10 CFR 51.31(a), the Commission has determined that the granting of these exemptions will not have a significant effect on the quality of the human environment as

discussed in the NRC staff's Finding of No Significant Impact and associated Environmental Assessment published in the *Federal Register* on December 21, 2023 (88 FR 88664).

7.0 CONCLUSION

The NRC staff has completed its review of the licensee's request for exemptions from certain requirements of 10 CFR 50.47(b), 10 CFR 50.47(c), and Appendix E to 10 CFR Part 50, as specified in this safety evaluation. On the basis of its review, the NRC staff concludes that (1) the postulated dose from any remaining applicable DBAs would not exceed the EPA early phase PAG limits to the public at the EAB and, (2) for any highly unlikely beyond-design basis-events impacting SFP integrity or the ability to cool spent fuel, the length of time available to implement pre-planned mitigation measures consistent with plant conditions and, should offsite authorities deem warranted, to implement protective actions using a CEMP approach, is adequate to ensure public health and safety. These conclusions are consistent with the NRC staff's evaluation, as provided to the Commission in SECY-23-0043, which was approved by the Commission in the SRM to SECY-23-0043.

Accordingly, the NRC staff has determined that, pursuant to 10 CFR 50.12(a), the exemptions evaluated above 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. In addition, special circumstances are present. Specifically, the NRC staff finds that the licensee's requested exemptions continue to meet the underlying purpose of the planning standards in 10 CFR 50.47 and the requirements in Appendix E to 10 CFR Part 50. In addition, given the reduced risk of offsite radiological consequences associated with the permanently shutdown and defueled condition at Palisades, these exemptions satisfy the special circumstances in 10 CFR 50.12(a)(2)(ii) and can be implemented 12 months after permanent cessation of power operations. 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.

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