

adversely affect Exelon's ability to physically secure the site or protect special nuclear material. Physical security measures at Oyster Creek are not affected by the requested exemption. Therefore, the proposed exemption is consistent with the common defense and security.

D. Special Circumstances

Special circumstances, in accordance with 10 CFR 50.12(a)(2)(ii), are present whenever application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the regulation.

The underlying purpose of 10 CFR 50.54(w)(1) is to provide reasonable assurance that adequate funds will be available to stabilize reactor conditions and cover onsite cleanup costs associated with site decontamination, following an accident that results in the release of a significant amount of radiological material. Oyster Creek permanently shut down on September 17, 2018, and permanently defueled on September 25, 2018, it is no longer possible for the radiological consequences of design-basis accidents or other credible events at Oyster Creek to exceed the limits of the EPA PAGs at the exclusion area boundary. The licensee has evaluated the consequences of highly unlikely, beyond-design-basis conditions involving a loss of coolant from the SFP. The analyses show that after 12 months (365 days) from cessation of power operations on September 17, 2018, the likelihood of such an event leading to a large radiological release is negligible. The NRC staff's evaluation of the licensee's analyses confirm this conclusion.

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

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

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

The NRC staff finds that compliance with the existing rule would result in an undue hardship or other costs that are significantly

in excess of those contemplated when the regulation was adopted and are significantly in excess of those incurred by others similarly situated.

Therefore, the special circumstances required by 10 CFR 50.12(a)(2)(ii) and 10 CFR 50.12(a)(2)(iii) exist.

E. Environmental Considerations

The NRC approval of the exemption to insurance or indemnity requirements belongs to a category of actions that the Commission, by rule or regulation, has declared to be a categorical exclusion, after first finding that the category of actions does not individually or cumulatively have a significant effect on the human environment. Specifically, the exemption is categorically excluded from further analysis under § 51.22(c)(25).

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

As the Deputy Director, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation, I have determined that approval of the exemption request involves no significant hazards consideration because reducing the licensee's onsite property damage insurance for Oyster Creek does not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. The exempted financial protection regulation is unrelated to the operation of Oyster Creek. Accordingly, there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite; and no significant increase in individual or cumulative public or occupational radiation exposure.

In addition, the exempted regulation is not associated with construction, so there is no significant construction impact. The exempted regulation does not concern the source term (i.e., potential amount of radiation in an accident), nor mitigation. Therefore, there is no significant increase in the potential for, or consequences of, a radiological accident. In addition, there would be no significant impacts to biota, water resources, historic properties, cultural resources, or socioeconomic conditions in the region. Moreover, the requirement for onsite property damage insurance involves surety, insurance, and indemnity matters. Accordingly, the exemption request meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(25).

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

IV. Conclusions.

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

Therefore, the Commission hereby grants Exelon an exemption from the requirements of 10 CFR 50.54(w)(1) for Oyster Creek. The licensee permanently ceased power operation at Oyster Creek on September 17, 2018. The exemption will permit Oyster Creek to lower the minimum required onsite insurance to \$50 million no earlier than 12 months (365 days) after the licensee's certification of permanent cessation of operation under § 50.82(a)(1).

The exemption is effective 12 months (365 days) from the certification of permanent cessation of operation under § 50.82(a)(1).

Dated at Rockville, Maryland, this 19th day of December 2018.

For the Nuclear Regulatory Commission.

/RA/

Kathryn M. Brock,
Deputy Director, Division of Operating
Reactor Licensing, Office of Nuclear Reactor
Regulation.

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NUCLEAR REGULATORY COMMISSION

[Docket No. 50-219; NRC-2018-0288]

Exelon Generation Company, LLC; Oyster Creek Nuclear Generating Station

AGENCY: Nuclear Regulatory
Commission.

ACTION: Exemption; issuance.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is issuing exemptions in response to a letter dated March 29, 2018, as supplemented by a letter dated May 8, 2018, exemption request from Exelon Generation Company, LLC (Exelon or the licensee). The exemption permits Exelon to reduce the required level of primary offsite liability insurance from \$450 million to \$100 million and to eliminate the requirement to carry secondary financial protection for Oyster Creek Nuclear Generating Station.

DATES: The exemption was issued on December 19, 2018.

ADDRESSES: Please refer to Docket ID NRC-2018-0288 when contacting the

NRC about the availability of information regarding this document. You may obtain publicly-available information related to this document using any of the following methods:

- **Federal Rulemaking Web Site:** Go to <http://www.regulations.gov> and search for Docket ID NRC-2018-0288. Address questions about Docket IDs in [Regulations.gov](http://www.regulations.gov) to Krupskaya Castellon; telephone: 301-287-9221; email: Krupskaya.Castellon@nrc.gov. For technical questions, contact the individual listed in the **FOR FURTHER INFORMATION CONTACT** section of this document.

- **NRC's Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly-available documents online in the ADAMS Public Documents collection at <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "Begin Web-based ADAMS Search." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by email to pdr.resource@nrc.gov. The ADAMS accession number for each document referenced (if it is available in ADAMS) is provided the first time that it is mentioned in this document.

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

FOR FURTHER INFORMATION CONTACT: John G. Lamb, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-3100; email: John.Lamb@nrc.gov.

SUPPLEMENTARY INFORMATION: The text of the exemption is attached.

Dated at Rockville, Maryland, this 21st day of December 2018.

For the Nuclear Regulatory Commission.

John G. Lamb,

Senior Project Manager, Special Projects and Process Branch, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation.

Attachment—Exemption

NUCLEAR REGULATORY COMMISSION

Docket No. 50-219

Exelon Generation Company, LLC

Oyster Creek Nuclear Generating Station

Exemption

I. Background.

Exelon Generation Company, LLC (Exelon, the licensee), is the holder of Renewed Facility Operating License No. DPR-16 for Oyster Creek Nuclear Generating Station

(Oyster Creek). By letter dated February 14, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18045A084), Exelon submitted to the U.S. Nuclear Regulatory Commission (NRC) a certification in accordance with Sections 50.82(a)(1)(i) of Title 10 of the *Code of Federal Regulations* (10 CFR), indicating that it plans to cease permanent operation no later than October 31, 2018. Exelon permanently ceased operations at Oyster Creek on September 17, 2018. The facility consists of a permanently shutdown and defueled boiling-water reactor located in the town of Forked River, Ocean County, New Jersey.

II. Request/Action.

By letter dated March 29, 2018 (ADAMS Accession No. ML18088A849), as supplemented by letter dated May 8, 2018 (ADAMS Accession No. ML18128A291), Exelon submitted a request for exemption from 10 CFR 140.11(a)(4), concerning offsite primary and secondary liability insurance. The exemption from 10 CFR 140.11(a)(4) would permit Exelon to reduce the required level of primary offsite liability insurance from \$450 million to \$100 million and to eliminate the requirement to carry secondary financial protection for Oyster Creek.

The regulation at 10 CFR 140.11(a)(4) requires each licensee to have and maintain primary financial protection in an amount of \$450 million. In addition, the licensee is required to participate in an industry retrospective rating plan (secondary financial protection) that commits each licensee to pay into an insurance pool to be used for damages that may exceed primary insurance coverage. Participation in the industry retrospective rating plan will subject Exelon to deferred premium charges up to a maximum total deferred premium of \$131,056,000 with respect to any nuclear incident at any operating nuclear power plant, and up to a maximum annual deferred premium of \$20,496,000 per incident.

The licensee states that the risk of an offsite radiological release is significantly lower at a nuclear power reactor that has permanently shut down and defueled, when compared to an operating power reactor. Similarly, the associated risk of offsite liability damages that would require insurance or indemnification is commensurately lower for permanently shut down and defueled plants. Therefore, Exelon is requesting an exemption from 10 CFR 140.11(a)(4), to permit a reduction in primary offsite liability insurance and to withdraw from participation in the industry retrospective rating plan.

III. Discussion.

Pursuant to 10 CFR 140.8, "Specific exemptions," the Commission may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in 10 CFR part 140, when the exemptions are authorized by law and are otherwise in the public interest. The NRC staff has reviewed Exelon's request for an exemption from 10 CFR 140.11(a)(4) and has concluded that the requested exemption is authorized by law and is otherwise in the public interest.

The Price Anderson Act of 1957 (PAA) requires that nuclear power reactor licensees have insurance to compensate the public for damages arising from a nuclear incident. Specifically, the PAA requires licensees of facilities with a "rated capacity of 100,000 electrical kilowatts or more" to maintain the maximum amount of primary offsite liability insurance commercially available (currently \$450 million) and a specified amount of secondary insurance coverage (currently up to \$131,056,000 per reactor). In the event of an accident causing offsite damages in excess of \$450 million, each licensee would be assessed a prorated share of the excess damages, up to \$131,056,000 per reactor, for a total of approximately \$13 billion per nuclear incident. The NRC's regulations at 10 CFR 140.11(a)(4) implement these PAA insurance requirements and set forth the amount of primary and secondary insurance each power reactor licensee must have.

As noted above, the PAA requirements with respect to primary and secondary insurance, and the implementing regulations at 10 CFR 140.11(a)(4), apply to licensees of facilities with a "rated capacity of 100,000 electrical kilowatts or more." When the NRC issues a license amendment to a decommissioning licensee to reflect the defueled status of the facility, the license amendment includes removal of the rated capacity of the reactor from the license.

Accordingly, a reactor that is undergoing decommissioning has no "rated capacity." Removal of the rated capacity from the facility of a decommissioning licensee, thus, allows the NRC to take the reactor licensee out of the category of reactor licensees that are required to maintain the maximum available insurance and to participate in the secondary retrospective insurance pool under the PAA, subject to a technical finding that lesser potential hazards exist at the facility after termination of operations.

The financial protection limits of 10 CFR 140.11(a)(4) were established to require a licensee to maintain sufficient insurance, as specified under the PAA, to satisfy liability claims by members of the public for personal injury, property damage, and the legal cost associated with lawsuits, as the result of a nuclear accident at an operating reactor with a rated capacity of 100,000 kilowatts electric (or greater). Thus, the insurance levels established by this regulation, as required by the PAA, were associated with the risks and potential consequences of an accident at an operating reactor with a rated capacity of 100,000 kilowatts electric (or greater).

The legal and associated technical basis for granting exemptions from 10 CFR part 140 is set forth in SECY-93-127, "Financial Protection Required of Licensees of Large Nuclear Power Plants During Decommissioning," dated May 10, 1993 (ADAMS Accession No. ML12257A628). The legal analysis underlying SECY-93-127 concluded that, upon a technical finding that lesser potential hazards exist after termination of operations (and removal of the rated capacity), the Commission has the discretion under the PAA to reduce the amount of insurance required of a licensee undergoing decommissioning.

As a technical matter, the fact that a reactor has permanently ceased operations is not

itself determinative as to whether a licensee may cease providing the offsite liability coverage required by the PAA and 10 CFR 140.11(a)(4). In light of the presence of freshly discharged irradiated fuel in the spent fuel pool (SFP) at a recently shutdown reactor, the primary consideration is the risk of offsite radiological release from a zirconium fire. That risk generally remains for about 10–16 months of decay time for the fuel used in the last cycle of power operation. After that time, the offsite consequences of an offsite radiological release from a zirconium fire are negligible for shutdown reactors, but the SFP is still operational and an inventory of radioactive materials still exists onsite. Therefore, an evaluation of the potential for offsite damage is necessary to determine the appropriate level of offsite insurance post shutdown, in accordance with the Commission's discretionary authority under the PAA to establish an appropriate level of required financial protection for such shutdown facilities.

The NRC staff has conducted an evaluation and concluded that, aside from the handling, storage, and transportation of spent fuel and radioactive materials for a permanently shut down and defueled reactor, no reasonably conceivable potential accident exists that could cause significant offsite damage. During normal power reactor operations, the forced flow of water through the reactor coolant system removes heat generated by the reactor. The reactor coolant system transfers this heat away from the reactor core by converting reactor feedwater to steam, which then flows to the main turbine generator to produce electricity. Most of the accident scenarios postulated for operating power reactors involve failures or malfunctions of systems that could affect the fuel in the reactor core, which in the most severe postulated accidents, would involve the release of large quantities of fission products. With the permanent cessation of reactor operations at Oyster Creek and the permanent removal of the fuel from the reactor core, such accidents are no longer possible. The reactor, reactor coolant system, and supporting systems no longer operate and have no function related to the storage of the irradiated fuel. Therefore, postulated accidents involving failure or malfunction of the reactor, reactor coolant system, or supporting systems are no longer applicable.

During reactor decommissioning, the principal radiological risks are associated with the storage of spent fuel onsite. On a case-by-case basis, licensees undergoing decommissioning have been granted permission to reduce the required amount of primary offsite liability insurance coverage from \$450 million to \$100 million and to withdraw from the secondary insurance pool. One of the technical criteria for granting the exemption is that the possibility of a design-basis event that could cause significant offsite damage has been eliminated.

The NRC staff performed an evaluation of the design-basis accidents for Oyster Creek being permanently defueled as part of SECY-18-0062, "Request by the Exelon Generation Company, LLC for Exemptions from Certain Emergency Planning Requirements for the Oyster Creek Nuclear Generating Station,"

dated May 31, 2018 (ADAMS Accession No. ML18030B340).

The licensee has stated, and the NRC staff agrees, that while spent fuel remains in the SFP, the only postulated design-basis accident that would remain applicable to Oyster Creek in the permanently defueled condition that could contribute a significant dose will be a fuel handling accident (FHA) in the Reactor Building, where the SFP is located. For completeness, the NRC staff also evaluated the applicability of other design-basis accidents documented in the Oyster Creek Updated Final Safety Analysis Report (UFSAR) (ADAMS Accession No. ML15307A558), to ensure that these accidents would not have consequences that could potentially exceed the 10 CFR 50.67 dose limits and Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," dose acceptance criteria or approach the U.S. Environmental Protection Agency (EPA) early phase protective action guides (PAGs).

In the Oyster Creek UFSAR, the licensee has determined that within 33 days after shutdown, the FHA doses would decrease to a level that would not warrant protective actions under the EPA early phase PAG framework, notwithstanding meeting the dose limit requirements under 10 CFR 50.67 and dose acceptance criteria under Regulatory Guide 1.183.

The NRC staff notes that the doses from an FHA are dominated by the isotope Iodine-131. The date of cessation of power operations of Oyster Creek occurred on September 17, 2018. With 12 months of decay, the thyroid dose from an FHA would be negligible. After 12 months of decay, the only isotope remaining in significant amounts, among those postulated to be released in a design-basis accident FHA, would be Krypton-85. Since Krypton-85 primarily decays by beta emission, the calculated skin dose from an FHA analysis would make an insignificant contribution to the total effective dose equivalent (TEDE), which is the parameter of interest in the determination of the EPA early phase PAGs for sheltering or evacuation. The NRC staff concludes that the dose consequence from an FHA for the permanently defueled Oyster Creek would not approach the EPA early phase PAGs. Therefore, any offsite consequence from a design-basis radiological release is unlikely, and a significant amount of offsite liability insurance coverage is not required.

The only beyond design-basis event that has the potential to lead to a significant radiological release at a permanently shut down and defueled (decommissioning) reactor is a zirconium fire. The zirconium fire scenario is a postulated, but highly unlikely, accident scenario that involves the loss of water inventory from the SFP, resulting in a significant heatup of the spent fuel and culminating in substantial zirconium cladding oxidation and fuel damage. The probability of a zirconium fire scenario is related to the decay heat of the irradiated fuel stored in the SFP. Therefore, the risks from a zirconium fire scenario continue to decrease as a function of the time that Oyster Creek has been permanently shut down.

In the analysis provided in Attachment 2, "Oyster Creek Nuclear Generating Station Zirconium Fire Analysis for Drained Spent Fuel Pool (Calculation C-1302-226-E310-457)," to the application, as supplemented by letters dated March 8, 2018, and March 19, 2018 (ADAMS Accession Nos. ML18067A087 and ML18078A146, respectively), the licensee compared the conditions for the hottest fuel assembly stored in the SFP to a criterion proposed in SECY-99-168, "Improving Decommissioning Regulations for Nuclear Power Plants," dated June 30, 1999 (ADAMS Accession No. ML12265A598), applicable to offsite emergency response for the unit in the decommissioning process. This criterion considers the time for the hottest assembly to heat up from 30 degrees Celsius (°C) to 900 °C adiabatically. If the heatup time is greater than 10 hours, then offsite emergency preplanning involving the plant is not necessary. Based on the limiting fuel assembly for decay heat and adiabatic heatup analysis presented in Attachment 2, at 12 months (365 days) after permanent cessation of power operations (i.e., 12 months decay time), the time for the hottest fuel assembly to reach 900 °C is 10 hours after the assemblies have been uncovered. As stated in NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," February 2001 (ADAMS Accession No. ML010430066), 900 °C is an acceptable temperature to use for assessing onset of fission product release under transient conditions (to establish the critical decay time for determining availability of 10 hours for deployment of mitigation equipment and, if necessary, for offsite agencies to take appropriate action to protect the health and safety of the public, if fuel and cladding oxidation occurs in air).

The NRC staff reviewed the calculation to verify that important physical properties of materials were within acceptable ranges and the results were accurate. The NRC staff determined that physical properties were appropriate. Therefore, the NRC staff found that after 12 months (365 days), more than 10 hours would be available before a significant offsite release could begin. The NRC staff concluded that the adiabatic heatup calculation provided an acceptable method for determining the minimum time available for deployment of mitigation equipment and, if necessary, implementing measures under a comprehensive general emergency plan.

In this regard, one technical criterion for relieving decommissioning reactor licensees from the insurance obligations applicable to an operating reactor is a finding that the heat generated by the SFP has decayed to the point where the possibility of a zirconium fire is highly unlikely.

This was addressed in SECY-93-127, where the NRC staff concluded that there was a low likelihood and reduced short-term public health consequences of a zirconium fire once a decommissioning plant's spent fuel has sufficiently decayed. In its Staff Requirements Memorandum, "Financial Protection Required of Licensees of Large Nuclear Power Plants during Decommissioning," dated July 13, 1993 (ADAMS Accession No. ML003760936), the

Commission approved a policy that authorized, through the exemption process, withdrawal from participation in the secondary insurance layer and a reduction in commercial liability insurance coverage to \$100 million, when a licensee is able to demonstrate that the spent fuel could be air-cooled if the SFP was drained of water.

The NRC staff has used this technical criterion to grant similar exemptions to other decommissioning reactors (e.g., Maine Yankee Atomic Power Station, published in the **Federal Register** on January 19, 1999 (64 FR 2920); Zion Nuclear Power Station, published in the **Federal Register** on December 28, 1999 (64 FR 72700); Kewaunee Power Station, published in the **Federal Register** on March 24, 2015 (80 FR 15638); and Crystal River Unit 3 Nuclear Generation Plant, published in the **Federal Register** on May 6, 2015 (80 FR 26100)).

Additional discussions of other decommissioning reactor licensees that have received exemptions to reduce their primary insurance level to \$100 million are provided in SECY-96-256, "Changes to the Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors, 10 CFR 50.54(w) and 10 CFR 140.11," dated December 17, 1996 (ADAMS Accession No. ML15062A483). These prior exemptions were based on the licensee demonstrating that the SFP could be air-cooled, consistent with the technical criterion discussed above.

The NRC staff has evaluated the issue of zirconium fires in SFPs and presented an independent evaluation of a SFP subject to a severe earthquake 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," September 2014 (ADAMS Accession No. ML14255A365). This evaluation concluded that, for a representative boiling-water reactor, fuel in a dispersed high-density configuration would be adequately cooled by natural circulation air flow within several months after discharge from a reactor if the pool was drained of water.

By letters dated August 22 and December 6, 2017 (ADAMS Accession Nos. ML17234A082 and ML17340A708, respectively), Exelon confirmed that the plant design and fuel storage configuration considered in NUREG-2161 were consistent with the Oyster Creek plant design and fuel storage configurations to be used in the decommissioning of Oyster Creek. The NRC staff independently confirmed that the Oyster Creek fuel assembly decay levels are also consistent with the spent fuel considered in NUREG-2161. Thus, the NRC staff has determined that after 12 months (365 days) decay, the fuel stored in the Oyster Creek SFP will be able to adequately be cooled by air in the unlikely event of pool drainage.

In SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning," dated June 28, 2000, and SECY-01-0100, "Policy Issues Related to Safeguards, Insurance, and Emergency Preparedness Regulations at Decommissioning Nuclear Power Plants Storing Fuel in Spent Fuel Pools," dated June 4, 2001 (ADAMS Accession Nos.

ML003721626 and ML011450420, respectively), the NRC staff discussed additional information concerning SFP zirconium fire risks at decommissioning reactors and associated implications for offsite insurance. Analyzing when the spent fuel stored in the SFP is capable of adequate air-cooling is one measure that demonstrates when the probability of a zirconium fire would be exceedingly low.

The licensee's analyses referenced in its exemption request demonstrate that under conditions where the SFP water inventory has drained and only air cooling of the stored irradiated fuel is available, there is reasonable assurance that 12 months (365 days) after the certification of permanent removal of fuel from the reactor vessel that the Oyster Creek spent fuel will remain at temperatures far below those associated with a significant radiological release.

In addition, the licensee performed adiabatic heatup analyses, in which a complete drainage of the SFP is combined with rearrangement of spent fuel rack geometry and/or the addition of rubble to the SFP; this type of analysis postulates that decay heat transfer from the spent fuel via conduction, convection, or radiation would be impeded. The licensee's adiabatic heatup analyses demonstrate that 12 months (365 days) after the certification of permanent removal of the fuel from the reactor vessel, there would be at least 10 hours after the loss of all means of cooling (both air and/or water), before the spent fuel cladding would reach a temperature where the potential for a significant offsite radiological release could occur.

In Exelon's letter dated March 19, 2018 (ADAMS Accession No. ML18088A849), the licensee furnished the following information: "Because of the length of time it would take for the adiabatic heatup to occur, there is ample time to respond (≥ 10 hours) to any drain down event that might cause such an occurrence by restoring cooling or makeup, or providing spray. As a result, the likelihood that such a scenario would progress to a zirconium fire is not deemed credible."

In the NRC staff's evaluation contained in SECY-18-0062, "Request by the Exelon Generation Company, LLC for Exemptions from Certain Emergency Planning Requirements for the Oyster Creek Nuclear Generating Station," dated May 31, 2018 (ADAMS Accession No. ML18030B340), the NRC staff assessed the Exelon accident analyses associated with the radiological risks from a zirconium fire at a permanently shut down and defueled Oyster Creek site. For the very unlikely beyond design-basis accident scenario where the SFP coolant inventory is lost in such a manner that all methods of heat removal from the spent fuel are no longer available, the NRC staff found there will be a minimum of 10 hours from the initiation of the accident until the cladding reaches a temperature where offsite radiological release might occur. The NRC staff finds that 10 hours is sufficient time to support deployment of mitigation equipment, consistent with plant conditions, to prevent the zirconium cladding from reaching a point of rapid oxidation.

The NRC staff has determined that the licensee's proposed reduction in primary

offsite liability coverage to a level of \$100 million, and the licensee's proposed withdrawal from participation in the secondary insurance pool for offsite financial protection, are consistent with the policy established in SECY-93-127 and subsequent insurance considerations resulting from zirconium fire risks, as discussed in SECY-00-0145 and SECY-01-0100. The NRC has previously determined in SECY-00-0145 that the minimum offsite financial protection requirement may be reduced to \$100 million and that secondary insurance is not required, once it is determined that the spent fuel in the SFP is no longer thermal-hydraulically capable of sustaining a zirconium fire based on a plant-specific analysis. In addition, the NRC staff notes that similar exemptions from these insurance requirements, have been granted to other permanently shutdown and defueled power reactors, upon satisfactory demonstration that zirconium fire risk from the irradiated fuel stored in the SFP is of negligible concern.

A. The Exemption is Authorized by Law

The PAA, and its implementing regulations in 10 CFR 140.11(a)(4), require licensees of nuclear reactors that have a rated capacity of 100,000 kilowatts electric or more to have and maintain \$450 million in primary financial protection and to participate in a secondary retrospective insurance pool. In accordance with 10 CFR 140.8, the Commission may grant exemptions from the regulations in 10 CFR part 140, as the Commission determines are authorized by law. The legal and associated technical basis for granting exemptions from 10 CFR part 140 are set forth in SECY-93-127. The legal analysis underlying SECY-93-127 concluded that, upon a technical finding that lesser potential hazards exist after termination of operations, the Commission has the discretion under the Price-Anderson Act to reduce the amount of insurance required of a licensee undergoing decommissioning.

Based on its review of Exelon's exemption request, the NRC staff concludes that the technical criteria for relieving Exelon from its existing primary and secondary insurance obligations have been met. As explained above, the NRC staff has concluded that no reasonably conceivable design-basis accident exists that could cause an offsite release greater than the EPA PAGs, and therefore, that any offsite consequence from a design-basis radiological release is unlikely, and the need for a significant amount of offsite liability insurance coverage is unwarranted. Additionally, the NRC staff determined that, after 12 months (365 days) decay, the fuel stored in the Oyster Creek SFP will be able to adequately be cooled by air in the unlikely event of pool drainage. Moreover, in the very unlikely beyond design-basis accident scenario where the SFP coolant inventory is lost in such a manner that all methods of heat removal from the spent fuel are no longer available, the NRC staff has determined that 10 hours would be available and is sufficient time to support deployment of mitigation equipment, consistent with plant conditions, to prevent the zirconium cladding from reaching a point of rapid oxidation. Thus, the NRC staff concludes that the fuel stored in

the Oyster Creek SFP will have decayed sufficiently by the requested effective exemption date of 12 months (365 days) after the certification that the fuel has been permanently removed from the reactor vessel, to support a reduction in the required insurance consistent with SECY-00-0145.

The NRC staff has determined that granting of the licensee's proposed exemption will not result in a violation of the Atomic Energy Act of 1954, Section 170, or other laws, as amended, which require licensees to maintain adequate financial protection. Accordingly, consistent with the legal standard presented in SECY-93-127, under which decommissioning reactor licensees may be relieved of the requirements to carry the maximum amount of insurance available and to participate in the secondary retrospective premium pool where there is sufficient technical justification, the NRC staff concludes that the requested exemption is authorized by law.

B. The Exemption is Otherwise in the Public Interest

The financial protection limits of 10 CFR 140.11 were established to require licensees to maintain sufficient offsite liability insurance to ensure adequate funding for offsite liability claims, following an accident at an operating reactor. However, the regulation does not consider the reduced potential for and consequence of nuclear incidents at permanently shutdown and decommissioning reactors.

The basis provided in SECY-93-127, SECY-00-0145, and SECY-01-0100 allows licensees of decommissioning plants to reduce their primary offsite liability insurance and to withdraw from participation in the retrospective rating pool for deferred premium charges. As discussed in these documents, once the zirconium fire concern is determined to be negligible, possible accident scenario risks at permanently shutdown and defueled reactors are greatly reduced, when compared to the risks at operating reactors, and the associated potential for offsite financial liabilities from an accident are commensurately less. The licensee has analyzed and the NRC staff has confirmed that the risks of accidents that could result in an offsite radiological risk are minimal, thereby justifying the proposed reductions in offsite primary liability insurance and withdrawal from participation in the secondary retrospective rating pool for deferred premium charges.

Additionally, participation in the secondary retrospective rating pool could potentially have adverse consequences on the safe and timely completion of decommissioning. If a nuclear incident sufficient to trigger the secondary insurance layer occurred at another nuclear power plant, the licensee could incur financial liability of up to \$131,056,000. However, because Oyster Creek is permanently shut down, it cannot produce revenue from electricity generation sales to cover such a liability. Therefore, such liability if subsequently incurred, could significantly affect the ability of the facility to conduct and complete timely radiological decontamination and decommissioning

activities. In addition, as SECY-93-127 concluded, the shared financial risk exposure to Exelon is greatly disproportionate to the radiological risk posed by Oyster Creek, when compared to operating reactors. The reduced overall risk to the public at decommissioning power plants does not warrant that Exelon be required to carry full operating reactor insurance coverage, after the requisite spent fuel cooling period has elapsed following final reactor shutdown. The licensee's proposed financial protection limits will maintain a level of liability insurance coverage commensurate with the risk to the public. These changes are consistent with previous NRC policy as discussed in SECY-00-0145, and exemptions approved for other decommissioning reactors. Thus, the underlying purpose of the regulations will not be adversely affected by the reductions in insurance coverage. Accordingly, an exemption from participation in the secondary insurance pool and a reduction in the primary insurance to \$100 million, a value more in line with the potential consequences of accidents, would be in the public interest in that this assures there will be adequate funds to address any of those consequences and helps to assure the safe and timely decommissioning of the reactor.

Therefore, the NRC staff has concluded that an exemption from 10 CFR 140.11(a)(4), which would permit Exelon to lower the Oyster Creek primary insurance levels and to withdraw from the secondary retrospective premium pool at the requested effective date of 12 months (365 days) after the certification of permanent fuel removal from the reactor vessel, is in the public interest.

C. Environmental Considerations

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

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

As the Deputy Director, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation, I have determined that approval of the exemption

request involves no significant hazards consideration, as defined in 10 CFR 50.92, because reducing a licensee's offsite liability requirements at Oyster Creek does not: (1) Involve a significant increase in the probability or consequences of an accident previously evaluated; (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. The exempted financial protection regulation is unrelated to the operation of Oyster Creek or site activities. Accordingly, there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite, and no significant increase in individual or cumulative public or occupational radiation exposure. The exempted regulation is not associated with construction, so there is no significant construction impact. The exempted regulation does not concern the source term (*i.e.*, potential amount of radiation in an accident), nor any activities conducted at the site. Therefore, there is no significant increase in the potential for, or consequences of, a radiological accident. In addition, there would be no significant impacts to biota, water resources, historic properties, cultural resources, or socioeconomic conditions in the region resulting from issuance of the requested exemption. The requirement for offsite liability insurance involves surety, insurance, or indemnity matters only.

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

IV. Conclusions.

Accordingly, the Commission has determined that, pursuant to 10 CFR 140.8, the exemption is authorized by law and is otherwise in the public interest. Therefore, the Commission hereby grants Exelon an exemption from the requirements of 10 CFR 140.11(a)(4) for Oyster Creek. The licensee permanently ceased operation at Oyster Creek on September 17, 2018. The exemption from 10 CFR 140.11(a)(4) permits Oyster Creek to reduce the required level of primary financial protection, from \$450 million to \$100 million and to withdraw from participation in the secondary layer of financial protection 12 months (365 days) after the certification of permanent fuel removal from the reactor vessel.

The exemption is effective 12 months (365 days) after the certification of permanent fuel removal from the reactor vessel under § 50.82(a)(1).

Dated at Rockville, Maryland, this 19th day of December 2018.

For the Nuclear Regulatory Commission.
Kathryn M. Brock,
Deputy Director, Division of Operating
Reactor Licensing, Office of Nuclear Reactor
Regulation.

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