



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

December 17, 2018

Mr. Bryan C. Hanson
Senior Vice President
Exelon Generation Company, LLC
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION – REVIEW OF
POST-SHUTDOWN DECOMMISSIONING ACTIVITIES REPORT
(EPID L-2018-LRO-0022)

Dear Mr. Hanson:

By letter dated May 21, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18141A775), as supplemented by letter dated September 24, 2018 (ADAMS Accession No. ML18267A216), Exelon Generation Company, LLC (Exelon, the licensee) submitted to the U.S. Nuclear Regulatory Commission (NRC, the Commission) the Post-Shutdown Decommissioning Activities Report (PSDAR), including the Site-Specific Decommissioning Cost Estimate (DCE), for Oyster Creek Nuclear Generating Station (Oyster Creek), pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.82(a)(4)(i).

The purpose of this letter is to inform you that, based on our review, the NRC staff finds that the PSDAR, as supplemented, contains the information required by 10 CFR 50.82(a)(4)(i) and the NRC staff has completed its review.

Exelon permanently ceased power operations at Oyster Creek on September 17, 2018 (ADAMS Accession No. ML18263A163). On September 25, 2018 (ADAMS Accession No. ML18268A258), Exelon certified that all fuel had been permanently removed from the Oyster Creek reactor vessel and placed into the Oyster Creek spent fuel pool (SFP).

The purposes of the PSDAR and DCE are to: (1) inform the public of the licensee's planned decommissioning activities, (2) assist in the scheduling of NRC resources necessary for the appropriate oversight activities, (3) ensure that the licensee has considered all of the costs of the planned decommissioning activities and has considered the funding for the decommissioning process, and (4) ensure that the environmental impacts of the planned decommissioning activities are bounded by those considered in existing environmental impact statements.

Pursuant to 10 CFR 50.82(a)(4)(i), the PSDAR must contain a description of the planned decommissioning activities along with a schedule for their accomplishment, a discussion that provides the reasons for concluding that the environmental impacts associated with site-specific decommissioning activities will be bounded by appropriate previously issued environmental impact statements, and a site-specific DCE, including the projected cost of managing irradiated

fuel. Additionally, pursuant to 10 CFR 50.82(a)(3), decommissioning is to be completed within 60 years of permanent cessation of operations. The regulations do not require the NRC to approve a licensee's submitted PSDAR.

Consistent with 10 CFR 50.82(a)(4)(ii), the public was offered opportunities to comment on the PSDAR. A notice of receipt of the PSDAR was published in the *Federal Register* (83 FR 27033) on June 11, 2018. The NRC staff requested that all comments be submitted by September 10, 2018, and there were three public comments submitted.

The first comment was from the State of New Jersey. The State of New Jersey provided a letter dated June 29, 2018 (ADAMS Accession No. ML18184A373). The State of New Jersey did not have comments on the PSDAR; however, in January 2018, the New Jersey Department of Environmental Protection reached a formal agreement with Exelon regarding certain specific activities and commitments for the decommissioning of Oyster Creek. The State of New Jersey provided the Administrative Consent Order that details the agreement as an attachment to the letter dated June 29, 2018.

The second comment was from Mr. Paul Dressler. Mr. Dressler provided email comments dated August 27, 2018 (ADAMS Accession No. ML18249A017). Mr. Dressler had several comments related to the proposed direct transfer of the Oyster Creek Renewed Facility Operating License (RFOL) from Exelon to Oyster Creek Environmental Protection, LLC (OCEP) as the licensed owner, and to Holtec Decommissioning International, LLC (HDI) as the licensed operator (ADAMS Accession No. ML18243A489). The NRC staff shall process the *Federal Register* notice for the license transfer application.

For example, Mr. Dressler commented that one of the entities involved in the proposed license transfer, SNC-Lavalin Group, "has issues with federal corruption and fraud charges against them." He also commented that there were risk factors involved with the proposed license transfer. With respect to these license transfer comments, the NRC staff notes that, consistent with 10 CFR 50.80, after appropriate notice to interested persons, the Commission will approve the transfer only if it determines that the proposed transferee is qualified to be the holder of the license and that transfer of the license is otherwise consistent with applicable provisions of law, regulations, and orders issued by the Commission pursuant thereto.

Mr. Dressler also commented that "the potential effect of rising seas and Oyster Creek...needs to be addressed in the PSDAR." With respect to this comment, the NRC staff notes that, by letter dated February 21, 2018 (ADAMS Accession No. ML18038B252), the NRC staff concluded that the Oyster Creek flooding focused evaluation was performed consistent with the guidance described in Nuclear Energy Institute (NEI) 16-05, Revision 1, "External Flooding Assessment Guidelines" (ADAMS Accession No. ML16165A178). Guidance document NEI 16-05, Revision 1, has been endorsed by the NRC Japan Lessons-Learned Division (JLD) interim staff guidance (ISG) JLD-ISG-2016-01, "Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flood Hazard Reevaluation" (ADAMS Accession No. ML16162A301). The NRC staff further concluded that Exelon has demonstrated that effective flood protection exists for the local intense precipitation and storm surge flood mechanisms during a beyond-design-basis external flooding event at Oyster Creek.

The third comment was from Mr. Ron Martyn, Chairman, Community Civic Affairs Group, Forked River, New Jersey (ADAMS Accession No. ML18324A776). Like Mr. Dressler, Mr. Martyn commented that there were risk factors involved with the proposed license transfer. As noted above, the license transfer will be addressed consistent with 10 CFR 50.80.

Mr. Martyn also commented that the community is concerned about the safety of the plant during decommissioning, especially with respect to decommissioning being proposed to take up to 60 years. In accordance with 10 CFR 50.82(a)(3), decommissioning must be completed within 60 years of permanent cessation of operations. The timeline for decommissioning within this time limit is a business decision. The NRC staff notes that, regardless of the decommissioning timeline, the NRC will maintain inspection activities in accordance with Inspection Manual Chapter (IMC) 2561, "Decommissioning Power Reactor Inspection Program" (ADAMS Accession No. ML17348A400).

The objectives of IMC 2561 are:

- To obtain information through direct observation and verification of licensee activities to determine whether the power reactor is being decommissioned safely, that spent fuel is safely and securely stored onsite or transferred to another licensed location, and that site operations and license termination activities are in conformance with applicable regulatory requirements, the facility licensing basis, licensee commitments, and management controls,
- To verify that (1) the licensee's procedures, processes, and programs for post-operational transition, decommissioning, and license termination are adequate, (2) necessary programs continue from the period of operation into decommissioning in accordance with the applicable regulatory requirements, and (3) the safety culture established during reactor operations is maintained. These decommissioning programs are assessed by inspection of four functional areas: plant status; modifications, maintenance, and surveillances; problem identification and resolution; and radiation protection,
- To identify declining trends in performance and perform inspections to verify that the licensee has resolved the issue(s) before performance declines below an acceptable level, and
- To provide for effective allocation of resources for the inspection of nuclear power reactors following permanent cessation of operations.

Like Mr. Dressler, Mr. Martyn commented about sea level rise, which comment is addressed above.

The NRC staff held a public meeting in the vicinity of Oyster Creek on July 17, 2018, to describe the decommissioning process, receive comments, and answer questions regarding the PSDAR. A summary of the meeting, dated August 31, 2018, can be found at ADAMS Accession No. ML18201A263. Public questions and comments on the PSDAR and other areas related to the site's decommissioning, including the NRC staff's responses, are available for review in the transcript of the meeting (ADAMS Accession No. ML18201A377).

Public comments from the meeting generally fell into two categories: (1) questions and comments that are within the regulatory purview of the NRC staff's review of the PSDAR, and, thus, were considered by the NRC staff during its review, and (2) questions and comments that, upon review, were found to be outside the regulatory authority of the NRC, or were not relevant

to the review performed by the NRC staff (i.e., whether the licensee's PSDAR meets the requirements of 10 CFR 50.82(a)(4)(i)) and, thus, were not considered.

The public questions and comments that the NRC staff considered during its review of the PSDAR are summarized below. Details of the specific questions or comments can be found in the documents referenced above.

- Questions or comments about whether there is reasonable assurance that there will be enough funds to decommission the facility and manage spent fuel until removed by the U.S. Department of Energy.
- Questions or comments about the decommissioning cost and who manages the Decommissioning Trust Fund.
- Questions or comments about whether on-site dry cask storage canisters are safe, robust, and above the flood line.
- Questions or comments about moving the spent fuel to a permanent national repository.

Public comments or questions that, upon review, were found to be outside of the NRC's regulatory purview or outside the scope of the NRC staff's review of the PSDAR, as defined in 10 CFR 50.82(a)(4)(i), are summarized below.

- Questions or comments about whether the current dry cask storage canisters can be monitored, inspected, or repaired.
- Questions or comments about the need for a decommissioning citizen oversight panel.
- Questions or comments about aging management issues associated with concrete and spent fuel casks.
- Questions or comments about whether spent fuel casks are spaced far enough apart to survive terrorist attacks.
- Questions or comments about how the armed security force will maintain the security for the site.

The NRC staff reviewed the PSDAR and DCE against the requirements in 10 CFR 50.82(a). In addition, the NRC staff used the guidance in Regulatory Guide (RG) 1.185, Revision 1, "Standard Format and Content for Post-Shutdown Decommissioning Activities Report," June 2013 (ADAMS Accession No. ML13140A038), in conducting its review and concludes the following.

1. Section 2.0 of the PSDAR, "Description of Planned Decommissioning Activities," and the DCE provide the applicable information identified in Section C.1 of RG 1.185, Revision 1. The NRC staff's review found that the licensee adequately described the activities associated with the major periods or milestones related to the decommissioning, as required by 10 CFR 50.82(a)(4)(i) and consistent with RG 1.185, Revision 1. These periods included Preparations for Dormancy, Dormancy,

Preparations for Decommissioning, Decommissioning (Dismantling and Decontamination), and Site Restoration.

2. Section 3.0 of the PSDAR, "Schedule of Planned Decommissioning Activities," and the DCE provide the estimated dates for initiation and completion of major decommissioning activities, as required by 10 CFR 50.82(a)(4)(i) and consistent with Section C.2 of RG 1.185, Revision 1. The NRC staff finds that the schedule for decommissioning activities is adequate to achieve Oyster Creek license termination within 60 years of permanent cessation of operations, as required by 10 CFR 50.82(a)(3).
3. Section 4.0 of the PSDAR, "Estimate of Expected Decommissioning and Spent Fuel Management Costs," and the DCE provide an estimate of the expected decommissioning costs for Oyster Creek. Exelon maintains a tax qualified fund (Qualified Trust) that has a balance of \$913,902,000 for Oyster Creek. The trustee for the Qualified Trust is Northern Trust Bank. The 10 CFR 50.75(c) minimum formula amount for Oyster Creek as of December 31, 2017, is \$584,847,000. Using the formula in 10 CFR 50.75(c), and the methodology provided in NUREG-1713 and NUREG-1307, the NRC staff independently calculated the 2018 minimum formula amount to be \$589,835,962. According to Exelon, the estimated radiological decommissioning cost of Oyster Creek is approximately \$1.1 billion (in 2017 dollars) and the estimated spent fuel management cost is approximately \$290 million (in 2017 dollars). The NRC staff reviewed the cost estimates against the guidance in RG 1.185, Revision 1, Section C.3 and finds that Exelon's site-specific DCE and irradiated fuel management estimate for Oyster Creek are reasonable, are described consistent with the guidance in RG 1.185, Revision 1, provide sufficient details associated with the funding mechanisms, and meet the requirements of 10 CFR 50.82(a)(4)(i).
4. Section 5.0 of the PSDAR, "Environmental Impacts," provides a discussion of the potential environmental impacts associated with the planned Oyster Creek decommissioning activities, as required by 10 CFR 50.82(a)(4)(i) and consistent with Section C.4 of RG 1.185, Revision 1. The PSDAR includes a comparison of the potential environmental impacts from the planned Oyster Creek decommissioning activities with impacts from similar activities provided in NUREG-0586, Supplement 1, "Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," November 2002, Volumes 1 and 2 (ADAMS Accession Nos. ML023470327 and ML023500228, respectively) (Decommissioning GEIS). A licensee in decommissioning is required to address the environmental impacts associated with site-specific decommissioning activities in both its PSDAR per 10 CFR 50.82(a)(4)(i) and before performing the decommissioning activities per 10 CFR 50.82(a)(6).

The environmental impacts associated with decommissioning activities are generically evaluated in the Decommissioning GEIS. The Decommissioning GEIS provides the significance of these decommissioning environmental impacts (i.e., SMALL, MODERATE, or LARGE) and the applicability of these impacts (i.e., generic or site-specific). For environmental impacts that the Decommissioning GEIS classifies as generic, these impacts are bounded by the generic evaluation in the Decommissioning GEIS and a licensee can rely on the information in the Decommissioning GEIS as a basis for meeting the decommissioning environmental requirement. For environmental impacts that the Decommissioning GEIS classifies as site-specific, or for decommissioning activities that could exceed the generic environmental impacts analyzed by the Decommissioning GEIS, the licensee cannot rely on the

Decommissioning GEIS. The Decommissioning GEIS identifies threatened and endangered species and environmental justice as environmental impacts that must be evaluated on a site-specific basis.

In its PSDAR, Exelon provided a summary of the reasons for reaching the conclusion that the environmental impacts of decommissioning Oyster Creek are bounded by the Decommissioning GEIS and by the "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 28, Regarding Oyster Creek Nuclear Generating Station," January 2007 (ADAMS Accession No. ML070100234) (SEIS).

By email dated September 12, 2018 (ADAMS Accession No. ML18256A002), the NRC staff issued a request for additional information (RAI), in part, because the Decommissioning GEIS cannot provide a basis for bounding site-specific impacts, such as impacts to threatened and endangered species or impacts to offsite terrestrial and aquatic resources, since the Decommissioning GEIS was unable to bound impacts generically for these resource areas. By letter dated September 24, 2018, Exelon responded to the RAI.

Exelon stated that impacts of original construction activities on terrestrial and aquatic resources are described in Sections 4.3.1 and 4.3.2 of the U.S. Atomic Energy Commission's "Final Environmental Statement Related to Operation of Oyster Creek Nuclear Generating Station" (ADAMS Accession No. ML072200150) (OL-FES). Exelon noted that such impacts include the effects of erosion and siltation on the aquatic environment, as well as effects of habitat destruction on the terrestrial environment within the original Oyster Creek site boundary. Exelon noted that PSDAR Section 5.1.6 states that any transfer of a large plant component during decommissioning would be of short duration and would have minimal impact on terrestrial resources, because the components will be transported across (1) a heavy-industrial area, (2) a highway, and (3) a previously-disturbed area that contains no unusual, rare, or sensitive plants or animals, and no important or sensitive habitats. Exelon asserted that, therefore, impacts of Oyster Creek decommissioning on aquatic and terrestrial resources from activities located outside of the operational area would be small and are bounded by the analyses in the Oyster Creek OL-FES.

License Condition 2.C.(17) of the Oyster Creek Renewed Facility Operating License No. DPR-16 (ADAMS Accession No. ML080280440) requires that Exelon "comply with the terms and conditions of the Incidental Take Statement associated with certain sea turtles in the Biological Opinion in effect or as subsequently issued by the National Marine Fisheries Service regarding operation of the facility." The Biological Opinion / Incidental Take Statement (ITS) most recently issued by the National Marine Fisheries Service (NMFS) in support of the NRC's renewal of the Oyster Creek operating license is dated November 21, 2011 (ADAMS Accession No. ML12006A217). Exelon stated that it intends to comply with this Biological Opinion / ITS until either the ITS is modified or the license condition is eliminated.

By letter dated October 16, 2018 (ADAMS Accession No. ML18289A370), Exelon submitted a request that the NRC reinstate the Endangered Species Act (ESA) Section 7 consultation that was the basis for the 2011 Biological Opinion / ITS. Such reinstatement would result in the NRC and the NMFS considering the effect to listed species of the current circumstances at Oyster Creek, which include the permanent cessation of operations and the permanent removal of fuel from the reactor vessel. This would provide a basis for Exelon to satisfy 10 CFR 50.82(a)(4)(i) with respect to discussing the reasons for concluding that the environmental impacts to threatened and endangered species will be bounded.

Additionally, as discussed in PSDAR Section 5.1.7, Exelon conducted a site-specific assessment for threatened and endangered species for Oyster Creek. Based on this evaluation, Exelon does not anticipate that the planned decommissioning activities at Oyster Creek would encroach on the habitat of any State or Federally-listed terrestrial species. However, in the future, when Oyster Creek decommissioning activities, such as demolition or disturbance of land areas, that could affect a protected species have been finally determined and scheduled, Exelon will update the site-specific assessment of environmental impacts to protected species in the PSDAR.

Finally, Exelon recognized that, although Oyster Creek is a typical mid-twentieth century light water reactor, as New Jersey's first nuclear electric generating station, it may be of historic interest at the State or local level. However, Exelon stated that there has been no Historic American Buildings Survey or Historic American Engineering Record documentation of Oyster Creek and no requests from the New Jersey Historic Preservation Office or other agencies to conduct this survey or documentation.

Based on its review and given Exelon's request to reinstate ESA Section 7 consultation, the NRC staff finds that the PSDAR, as supplemented, contains the information required by 10 CFR 50.82(a)(4)(i) and is consistent with RG 1.185, Revision 1. As required by 10 CFR 50.82(a)(7), Exelon must notify the NRC in writing and send a copy to the State of New Jersey before performing any decommissioning activity inconsistent with, or making any significant schedule change from, the planned decommissioning activities and schedules described in the PSDAR, including changes that significantly increase the decommissioning costs. As required, Exelon will verify that the decommissioning activities meet the requirements of 10 CFR 50.82(a)(6)(i) through 10 CFR 50.82(a)(6)(iii) or seek appropriate regulatory approval if needed.

The application for license transfer dated August 31, 2018 (ADAMS Accession No. ML18243A489), states the following:

Following the license transfer, HDI will complete the transfer of spent nuclear fuel to the ISFSI [Independent Spent Fuel Storage Installation] as soon as practicable and will promptly proceed with decontamination and dismantlement of the site (other than the ISFSI). The project goal for completing the radiological decommissioning, restoration, and release for unrestricted use of the non-ISFSI portions is within approximately eight years of the license transfer.

Accordingly, HDI plans to select the DECON methodology for decommissioning Oyster Creek. Going from the currently proposed SAFSTOR methodology to the DECON methodology would be a significant schedule change, and the NRC staff would expect a revised PSDAR. The application dated August 31, 2018, also states the following:

HDI plans to submit a revised PSDAR (including an Updated Spent Fuel Management Plan), reflecting OCEP's and HDI's plans for implementing accelerated decommissioning (i.e., DECON). OCEP and HDI will also submit a request for an exemption to allow OCEP to use the trust funds to pay for spent fuel management and site restoration costs.

By letter dated September 28, 2018 (ADAMS Accession No. ML18275A116), HDI submitted a "Notification of Revised Post-Shutdown Decommissioning Activities Report and Revised Site-Specific Decommissioning Cost Estimate for Oyster Creek Nuclear Generating Station,"

pursuant to 10 CFR 50.82(a)(4)(i). However, HDI is not the licensee for Oyster Creek; therefore, the NRC staff is treating the HDI revised PSDAR submittal dated September 28, 2018, as a supplement to the Oyster Creek license transfer application dated August 31, 2018, until such time as the NRC makes a regulatory decision regarding the Oyster Creek license transfer application.

In accordance with 10 CFR Part 2, "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 Web site at <http://www.nrc.gov/reading-rm/adams.html>.

If you have any questions regarding this letter, please contact me at 301-415-3100 or by e-mail at John.Lamb@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "John G. Lamb". The signature is fluid and cursive, with the first letters of each name being capitalized and prominent.

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

Docket No. 50-219

cc: Listserv

SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION – REVIEW OF
 POST-SHUTDOWN DECOMMISSIONING ACTIVITIES REPORT
 (EPID L-2018-LRO-0022) DATED DECEMBER 17, 2018

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ADAMS Accession No. ML18241A068

***via memo**

****via email**

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