

## LICENSE FOR INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, *Code of Federal Regulations*, Chapter 1, Part 72, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, and possess the power reactor spent fuel and other radioactive materials associated with spent fuel storage designated below; to use such material for the purpose(s) and at the place(s) designated below; and to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified herein.

Licensee

- |   |  |  |
|---|--|--|
| 1. Calvert Cliffs Nuclear Power Plant, LLC<br>(Owner)<br>Exelon Generation Company, LLC. (Operator)   | 3. License No. Renewed License SNM-2505                        |  |
| 2. 300 Exelon Way<br>Kennett Square, PA 19348   | Amendment No. 11   |  |
|   | 4. Expiration November 30, 2052                                |  |
|   | 5. Docket or Reference No. 72-8                                |  |
| 6. Byproduct, Source, and/or Special Nuclear Material   | 7. Chemical or Physical Form                                   | 8. Maximum Amount That Licensee May Possess at Any One Time Under This License |
| A. Spent fuel assemblies from Calvert Cliffs Nuclear Station Units 1 and 2 reactor using natural water for cooling and enriched not greater than 5.0 percent U-235 and associated radioactive materials related to receipt, storage, and transfer of fuel assemblies. | A. As UO <sub>2</sub> clad with zirconium or zirconium alloys. | A. 1,558.27 TeU of spent fuel assemblies.                                      |

9. Authorized Use: For use in accordance with the conditions in this license and the attached Technical Specifications. The basis for this amendment was submitted in the application dated March 26, 2014, as supplemented July 25, October 10, and December 3, 2014, February 3, March 10, June 29, September 11, September 25, and November 17, 2015, and the Updated Safety Analysis Report (USAR) dated September 8, 2008, as supplemented September 9, 2010, September 18, 2012, November 12, 2014, and January 7, 2015.

The material identified in 6.A and 7.A above is authorized for receipt, possession, storage, and transfer.

10. Authorized Place of Use: The licensed material is to be received, possessed, transferred, and stored at the Calvert Cliffs Independent Spent Fuel Storage Installation (ISFSI) located on the Calvert Cliffs Nuclear Power Plant site in Calvert County, Maryland. This site is described in Chapter 2 of the licensee's SAR for the Calvert Cliffs ISFSI.
11. The Technical Specifications contained in Appendix A attached hereto are incorporated into the license. Exelon Generation shall operate the installation in accordance with the Technical Specifications in Appendix A.

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12. Exelon Generation shall fully implement and maintain in effect all provisions of the independent spent fuel storage installation physical security, guard training and qualification, and safeguards contingency plans previously approved by the Commission and all amendments made pursuant to the authority of 10 CFR 72.56, 10 CFR 72.44(e) and 72.186.

13. The Technical Specifications for Environmental Protection contained in Appendix A attached hereto are incorporated into the license.

Specifications required pursuant to 10 CFR 72.44(d), stating limits on the release of radioactive materials for compliance with limits of 10 CFR Part 20 and "as low as is reasonably achievable objective" for effluents are not applicable. Dry Shielded Canister (DSC) external surface contamination within the limits of Technical Specification 3.2.3.1 ensures that the offsite dose will be inconsequential. In addition, there are no normal or off-normal releases or effluents expected from the double-sealed storage canisters of the ISFSI.

Specifications required pursuant to 10 CFR 72.44(d)(1) for operating procedures, for control of effluents, and for the maintenance and use of equipment in radioactive waste treatment systems to meet the requirements of 10 CFR 72.104 are not applicable. There are, by the design of the sealed storage canisters at the ISFSI, no effluent releases. Also, all Calvert Cliffs site DSC and Transfer Cask (TC) loading and unloading operations and waste treatment there from will occur at the Calvert Cliffs Nuclear Power Plant under the specifications of its operating licenses.

14. The design, construction, and operation of the ISFSI shall be accomplished in accordance with the NRC regulations specified in Title 10 of the U.S. *Code of Federal Regulations*. All commitments to the applicable NRC Regulatory Guides and to engineering and construction codes shall be carried out.

15. The double closure seal welds at the bottom end of the DSC shall satisfy the Liquid Penetrant Acceptance Standards of ASME B&PV Code Section III, Division 1, Subsection NB-5350 (1983) for the NUHOMS-24P and NUHOMS-32P DSCs. The double closure seal welds at the bottom of the DSC shall satisfy the Liquid Penetrant Acceptance Standards of ASME B&PV Code Section III, 1, Subsection NB-5350 (1998 with addenda up to and including 1999) for the NUHOMS 32-PHB DSCs. The seal welds at the bottom of the NUHOMS-24P and NUHOMS-32P DSCs shall be leak tested in accordance with ANSI N14.5 (1987). For the NUHOMS-32PHB, the entire confinement boundary, including DSC shell and bottom cover plate, seal welds at bottom end of DSC, and longitudinal and circumferential DSC shell welds, shall undergo a fabrication leakage test in accordance with ANSI N14.5-1997; acceptance criterion shall be less than 1E-7 atm cc/sec helium.

16. Fuel and TC movement and handling activities which are to be performed in the Calvert Cliffs Nuclear Power Plant Auxiliary Building will be governed by the requirements of the Exelon Generation Facility Operating Licenses (DRP-53 and -69) and associated Technical Specifications.

17. Pursuant to 10 CFR 72.7, the licensee is hereby exempted from the provisions of 10 CFR 72.122(i) with respect to providing instrumentation and control systems for the DSC and HSM during storage operations.

18. Within 90 days after issuance of the license, the licensee shall submit an updated safety analysis report (USAR), and continue to update the SAR pursuant to the requirements in 10 CFR 72.70(b) and (c).

The USAR shall include Attachment 4 to the Response to Fourth Request for Additional Information for Renewal Application, "ISFSI Updated Safety Analysis Report Supplement and Changes" [Agency

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Document (ADAMS) Accession Number ML14267A065] as documented in the supplemented License Renewal Application (hereinafter referred to as Attachment 4). The licensee may make changes to the USAR, including changes to Attachment 4, consistent with 10 CFR 72.48(c).

19. Exelon Generation shall update, revise or create, procedures for implementing the activities in the Aging Management Programs (AMPs) summarized in Attachment 4 within 180 day of the renewed license issuance.

The licensee shall maintain procedures that implement the AMPs throughout the term of this license.

Each procedure for implementing the AMPs shall contain a reference to the specific AMP provision the procedure is intended to implement. The reference shall be maintained if procedures are modified.

Within 240 days of issuance of the renewed license, the licensee shall confirm, in a letter to the Commission (submitted pursuant to 10 CFR 72.4), that: the procedures for implementation of the activities as described in the AMPs summarized in Attachment 4 are in place, that the procedures will be maintained for the term of this license, and that appropriate references to the AMPs are provided in the procedures.

20. The licensee shall not remove (a) any structure, system or component (SSC) or subcomponent, or (b) any aging mechanism or aging effect, as detailed in Tables 9.6-1 through 9.6-4 in Attachment 4, from the scope of the AMPs.
21. With respect to the aging management activities for the Horizontal Storage Module (HSM), as described in the "HSM Aging Management Program" in Attachment 2 to the Response to Fourth Request for Additional Information for Renewal Application:
- (a) The licensee shall perform visual inspections of accessible exterior surfaces of the HSM concrete, including any exposed reinforcing steel and steel embedments. The inspections shall be performed at intervals not to exceed one year.
  - (b) The licensee shall perform visual inspections for a minimum of five targeted HSMs to be selected based on the results of the inspections per Condition 21(a). The targeted visual inspections shall be performed at intervals not to exceed every five years. The licensee shall evaluate for loss of intended function for inspection results meeting Tier 2 or Tier 3 acceptance criteria in ACI 349.3R-02.
  - (c) The licensee shall perform subsequent visual inspections of the interior surfaces of HSM-1 and HSM-15, first inspected in June 2012 [Agency Document (ADAMS) Accession Number ML12212A216], at intervals not to exceed every five years. These inspections will focus on the interior concrete and steel subcomponents, including the DSC support structure. The licensee shall evaluate for loss of intended function for inspection results meeting Tier 2 or Tier 3 acceptance criteria in ACI 349.3R-02.
  - (d) The licensee shall obtain groundwater chemistry samples representative of the HSM below-grade environment for a minimum of 3 locations at intervals not to exceed every five years. The licensee shall characterize these groundwater chemistry samples to monitor for an aggressive below-grade environment, as defined in ASME Code Section XI Subsection IWL.
22. Exelon Generation shall submit an evaluation of the results of the confirmatory evaluation related to high burnup fuel cladding performance specified in the "High Burnup Fuel Aging Management Program" in

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Attachment 2 to the Response to Fourth Request for Additional Information for Renewal Application, in a letter to the NRC (submitted pursuant to 10 CFR 72.4), by April 30, 2028. The evaluation shall include an assessment of the ability of stored high burnup fuel assemblies to continue to perform the intended function(s). If the licensee identifies fuel which is unable to perform the intended function(s), the licensee shall cease use of such cask or submit a license amendment request to modify this license condition.

23. With respect to the aging management activities for the Dry Shielded Canister (DSC), as described in the "DSC External Surfaces Aging Management Program" in Attachment 2 to the Response to Fourth Request for Additional Information for Renewal Application (hereinafter referred to as Attachment 2), the licensee must perform the inspections at intervals not to exceed 5 years:
- (a) The licensee shall perform DSC inspections on canisters that are determined to be most susceptible to aging effects. The licensee shall include DSC-6 in HSM-15 and DSC-11 in HSM-1 in inspections throughout the duration of the renewed license period. The licensee shall continue to obtain samples using method(s) that will allow DSC surface deposits to be collected and analyzed.
  - (b) The licensee shall perform inspections of DSC external surfaces using proven technology reasonably available at the time the inspection is conducted which is capable of meeting the physical access and environmental constraints of the HSM interior.
    - i. At a minimum, the licensee shall perform the inspection identified in the DSC External Surfaces Aging Management Program, as described Attachment 2, which identifies remote visual inspection using inspection equipment capable of meeting ASME Section XI Article IWA-2210 VT-3 standards to the extent allowed by the inspection equipment.
    - ii. For areas outside of the range capable of being inspected to VT-3 standards, the licensee shall inspect and document these areas to the best of the ability of the inspector.
  - (c) Remote visual inspections performed by the licensee shall include the surfaces identified in the DSC External Surfaces Aging Management Program, as described Attachment 2. The licensee shall evaluate the condition of the DSC shell at the support rail contact region based on the appearance of the visible regions immediately adjacent to the crevice location. Remote visual inspections will cover the DSC surface areas to the maximum extent practicable including;
    - i. The bottom end of the DSC visible from the HSM doorway opening including the grapple ring, and excluding areas obstructed by the seismic restraint and the sides of bottom shield plug where access is restricted by the small HSM doorway gap;
    - ii. The top cover including the closure weld and excluding areas obstructed by the HSM rail back stops;
    - iii. The DSC shell from and including the center circumferential weld (WJ-3) to the top end of the DSC (near the back wall of the HSM), including the longitudinal weld in this region (WJ-2) and excluding the portion of the shell obstructed by the HSM rails;
    - iv. The portion of the DSC shell from the center circumferential weld to the bottom end of the DSC (near the HSM doorway), including the longitudinal weld in this region (WJ-1) and excluding the portion of the shell obstructed by the HSM rails.

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- (d) The licensee shall use inspection acceptance criteria defined in the Dry Shielded Canister (DSC) External Surfaces Aging Management Program included in Attachment 2 to the Response to Fourth Request for Additional Information for Renewal Application:
- i. Acceptable signifies that a component is free of significant deficiencies or degradation that could lead to the loss of intended function.
  - ii. Acceptable with Defects signifies that a component contains deficiencies or degradation new or increased areas of pitting, crevice corrosion, or staining, compared to the baseline but will remain able to perform its design basis function until the next inspection.
  - iii. Unacceptable signifies a component contains deficiencies or degradation that either prevents (or could prevent prior to the next inspection the ability to perform their intended function such as a positive identification of the presence of cracks on the DSC surface with length exceeding the requirements of ASME Section XI Table IWB-3514-2 acceptance criteria for surface examination of in-service austenitic steel components.
  - iv. In the event of an inspection finding other than acceptable as described in (d)(i) above, the licensee shall issue a condition report in the site corrective action program to drive further evaluation, characterization, and other actions as needed to preserve the DSC intended functions. The cask may not develop through wall cracking or any other through wall breach that places the licensee out of compliance with 72.122(h)(5), and which the licensee is unable to, through corrective actions, return the DSC to its approved design basis. If the licensee identifies such through wall cracking or other through wall breach and is unable, through corrective actions, to return the DSC to its approved design basis, the licensee shall cease use of such cask or submit a license amendment request to modify this license condition.

This renewed license is effective as of the date of issuance shown below.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

/RA/

Steve Ruffin, Acting Chief  
 Spent Fuel Licensing Branch  
 Division of Spent Fuel Management  
 Office of Nuclear Material Safety  
 and Safeguards  
 Washington, DC 20555

Date of Issuance: October 23, 2014

Amendment No. 11, April 26, 2016

Attachment: Technical Specifications