



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

July 1, 2026

Mr. Christopher H. Mudrick Sr.
Senior Vice President
Constellation Energy Generation, LLC
President and Chief Nuclear Officer
Constellation Nuclear
200 Exelon Way
Kennett Square, PA 19348

**SUBJECT: CHRISTOPHER M. CRANE CLEAN ENERGY CENTER – ISSUANCE OF
AMENDMENT NO. 307 RE: LICENSE AMENDMENT REQUEST TO REVISE
LICENSE TO ALLOW RECEIPT OF NEW REACTOR FUEL
(EPID L-2025-LLA-0102)**

Dear Mr. Mudrick:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 307 to Renewed Facility License No. DPR-50 for the Christopher M. Crane Clean Energy Center. The amendment consists of changes to the license in response to your application dated June 27, 2025, as supplemented by letter dated April 2, 2026. Specifically, the amendment revises license condition (LC) 2.b.(2) to allow the receipt and possession of new reactor fuel and new sealed neutron sources and adds new LCs 2.c.(23) and 2.c.(24) regarding the storage of new reactor fuel and new sealed neutron sources. Prior to the amendment, LC 2.b.(2) was limited to the possession of reactor fuel and sealed neutron sources for reactor startup that had been previously used.

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's bi-weekly *Federal Register* notice.

Sincerely,

/RA/

Brent Ballard, Project Manager
Operating Reactor Licensing 3
Division of Licensing Projects 1
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosures:

1. Amendment No. 307 to DPR-50
2. Safety Evaluation

cc: GovDelivery



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

CONSTELLATION ENERGY GENERATION, LLC

DOCKET NO. 50-289

CHRISTOPHER M. CRANE CLEAN ENERGY CENTER

AMENDMENT TO RENEWED FACILITY LICENSE

Amendment No. 307
Renewed License No. DPR-50

1. The U.S. Nuclear Regulatory Commission (NRC, the Commission) has found that:
 - A. The application for amendment by Constellation Energy Generation, LLC (the licensee) dated June 27, 2025, as supplemented by letter dated April 2, 2026, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes as indicated in the attachment to this license amendment. Paragraph 2.b.(2) of Renewed Facility License No. DPR-50 is hereby amended to read as follows:

2.b.(2) Constellation Energy Generation, LLC pursuant to the Act and 10 CFR Parts 30, 40 and 70 to receive and possess at any time any byproduct, source and special nuclear material as reactor fuel, sealed neutron sources for reactor startup, as fission detectors, and sealed sources for reactor instrumentation and to possess and use at any time any byproduct, source and special nuclear material as sealed sources for radiation monitoring equipment calibration in amounts as required;

Paragraphs 2.c.(23) and 2.c.(24) are hereby added to Renewed Facility License No. DPR-50 to read as follows:

2.c.(23) Prior to receiving new fuel, the programs, procedures, and systems, structures, and components necessary to support receipt and storage of new reactor fuel and sealed neutron sources, as documented in CEG's response to requests for additional information dated April 2, 2026 (ML26092A068), will be restored such that there is reasonable assurance that the activities authorized by License Condition 2.b.(2) will continue to be conducted in accordance with the current defueled licensing basis.

2.c.(24) New fuel may be stored in the new fuel storage vault, spent fuel pools, or shipping containers.

- Prior to loading new fuel and whenever there is fuel in the pool, the spent fuel pool is filled to at least the 343'6" elevation with water borated to the concentration of at least 600ppm. The boron concentration and fuel pool level will be verified prior to moving fuel in or over the spent fuel pool and every 7 days while fuel is in the pool. If boron concentration is below 600ppm, fuel movement in or over the spent fuel pool will stop and concentration will be restored prior to recommencing fuel movement. If spent fuel pool level is below the 343'6" elevation, actions to restore fuel pool level will be initiated.
- For the new fuel storage vault, the fuel assemblies are stored in racks in parallel rows, having a nominal center to center distance of 21-1/8 inches in both directions.
 - When fuel is being stored in the new fuel storage vault, twelve (12) storage locations (aligned in two rows of six locations each; traverse row numbers four and eight) must be left vacant of fissile or moderating material to provide sufficient neutron leakage to satisfy the NRC maximum allowable reactivity value under the optimum low moderator density condition.
 - The new fuel storage vault will store new fuel with enrichment not to exceed 5.0 WT% U-235.
- For Spent Fuel Pool "A", the fuel assemblies are stored in racks in parallel rows, having a nominal center to center distance of 11.1 inches in both directions for the Region I racks.
 - Region I will store new fuel with enrichment not to exceed 5.0 WT% U-235.

- No new fuel will be stored in Region II.
 - For Spent Fuel Pool "B", the fuel assemblies are stored in racks in parallel rows, having nominal center to center distance of 13-5/8 inches in both directions.
 - Fuel Pool B will store new fuel with enrichment not to exceed 4.37 WT% U-235.
3. This amendment is effective as of its date of issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Ilka Berrios, Chief
Operating Reactor Licensing 3
Division of Licensing Projects 1
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed
Facility License No. DPR-50

Date of Issuance: July 1, 2026

ATTACHMENT TO LICENSE AMENDMENT NO. 307
CHRISTOPHER M. CRANE CLEAN ENERGY CENTER
RENEWED FACILITY LICENSE NO. DPR-50
DOCKET NO. 50-289

Replace the following pages of the Renewed Facility License with the revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove

- 2 -
- 5 -
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Insert

- 2 -
- 5 -
- 6 -

- i. The receipt, possession, and use of source, byproduct and special nuclear material as authorized by this license will be in accordance with the Commission's regulations in 10 CFR Parts 30, 40, and 70, including 10 CFR Section 30.33, 40.32, 70.23 and 70.31.
 - j. DELETED
2. Renewed Facility License No. DPR-50 is hereby issued to Constellation Energy Generation, LLC to read as follows:
- a. This renewed license applies to the Christopher M. Crane Clean Energy Center (Crane Clean Energy Center or CCEC), a pressurized water reactor and associated equipment (the facility), owned by Constellation Energy Generation, LLC. The facility is located in Dauphin County, Pennsylvania, and is described in the "Updated Final Safety Evaluation Report (UFSAR)" as supplemented and amended and the Environmental Report as supplemented and amended.
 - b. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses:
 - (1) Constellation Energy Generation, LLC pursuant to Section 104b of the Act and 10 CFR Part 50, "Licensing of Production and Utilization Facilities," to possess and use the facility as required for fuel storage in accordance with the procedures and limitations set forth in this renewed license;
 - (2) Constellation Energy Generation, LLC pursuant to the Act and 10 CFR Parts 30, 40 and 70 to receive and possess at any time any byproduct, source and special nuclear material as reactor fuel, sealed neutron sources for reactor startup, as fission detectors, and sealed sources for reactor instrumentation and to possess and use at any time any byproduct, source and special nuclear material as sealed sources for radiation monitoring equipment calibration in amounts as required;

- (13) DELETED
- (14) DELETED
- (15) Constellation Energy Generation, LLC shall take all necessary steps to ensure that the decommissioning trust is maintained in accordance with the application, the requirements of the Order Approving Transfer of License and Conforming Amendment, dated January 8, 2009, and the related Safety Evaluation dated December 23, 2008.
- (16) DELETED
- (17) DELETED
- (18) DELETED
- (19) DELETED
- (20) DELETED
- (21) DELETED
- (22) DELETED
- (23) Prior to receiving new fuel, the programs, procedures, and systems, structures, and components necessary to support receipt and storage of new reactor fuel and sealed neutron sources, as documented in CEG's response to requests for additional information dated April 2, 2026 (ML26092A068), will be restored such that there is reasonable assurance that the activities authorized by License Condition 2.b.(2) will continue to be conducted in accordance with the current defueled licensing basis.
- (24) New fuel may be stored in the new fuel storage vault, spent fuel pools, or shipping containers.
- Prior to loading new fuel and whenever there is fuel in the pool, the spent fuel pool is filled to at least the 343'6" elevation with water borated to the concentration of at least 600ppm. The boron concentration and fuel pool level will be verified prior to moving fuel in or over the spent fuel pool and every 7 days while fuel is in the pool. If boron concentration is below 600ppm, fuel movement in or over the spent fuel pool will stop and concentration will be restored prior to recommencing fuel movement. If spent fuel pool level is below the 343'6" elevation, actions to restore fuel pool level will be initiated.
 - For the new fuel storage vault, the fuel assemblies are stored in racks in parallel rows, having a nominal center to center distance of 21-1/8 inches in both directions.
 - When fuel is being stored in the new fuel storage vault, twelve (12) storage locations (aligned in two rows of six locations each; transverse

row numbers four and eight) must be left vacant of fissile or moderating material to provide sufficient neutron leakage to satisfy the NRC maximum allowable reactivity value under the optimum low moderator density condition.

- The new fuel storage vault will store new fuel with enrichment not to exceed 5.0 WT% U-235.
 - For Spent Fuel Pool "A", the fuel assemblies are stored in racks in parallel rows, having a nominal center to center distance of 11.1 inches in both directions for the Region I racks.
 - Region I will store new fuel with enrichment not to exceed 5.0 WT% U-235.
 - No new fuel will be stored in Region II.
 - For Spent Fuel Pool "B", the fuel assemblies are stored in racks in parallel rows, having nominal center to center distance of 13-5/8 inches in both directions.
 - Fuel Pool B will store new fuel with enrichment not to exceed 4.37 WT% U-235.
- d. This license is effective as of the date of issuance and is effective until the Commission notifies the licensee in writing that the license is terminated.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Attachment: Appendix A, Technical
Specifications

Date of Issuance: October 22, 2009



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 307 TO

RENEWED FACILITY LICENSE NO. DPR-50

CONSTELLATION ENERGY GENERATION, LLC

CHRISTOPHER M. CRANE CLEAN ENERGY CENTER

DOCKET NO. 50-289

1.0 INTRODUCTION

By application dated June 27, 2025 (Agencywide Documents Access and Management System Accession No. ML25178A294), as supplemented by letter dated April 2, 2026 (ML26092A068), Constellation Energy Generation, LLC (the licensee) submitted to the U.S. Nuclear Regulatory Commission (NRC, the Commission) a license amendment request (LAR) for the Christopher M. Crane Clean Energy Center (the facility).¹ The proposed amendment would revise Renewed Facility License No. DPR-50 license condition (LC) 2.b.(2) to allow the receipt and possession of new reactor fuel and new sealed neutron sources and would add new LCs 2.c.(23) and 2.c.(24) regarding the storage of new reactor fuel and new sealed neutron sources. Currently, the license is limited to, in part, the possession of byproduct, source, and special nuclear material (SNM) used previously as reactor fuel, sealed neutron sources used previously for reactor startup, as fission detectors, and sealed sources for reactor instrumentation.

A notice of consideration of proposed issuance of amendments with proposed no significant hazards consideration determination was published in the *Federal Register* on September 30, 2025 (90 FR 46935), and there has been no public comment on such determination. The supplemental letter dated April 2, 2026, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in this notice.

¹ On November 16, 2021, the NRC approved an indirect license transfer application, which included changing the name of "Exelon Generation Company, LLC" to "Constellation Energy Generation, LLC" (ML21277A245). On May 13, 2025, the NRC approved a license amendment to reflect the change of the facility's name from "Three Mile Island Nuclear Station, Unit 1" to the "Christopher M. Crane Clean Energy Center" (ML25100A006). While some actions or events referred to herein occurred under the names "Exelon Generation Company, LLC" and "Three Mile Island Nuclear Station, Unit 1," for simplicity, "the licensee" and "the facility" will be used, respectively.

1.1 Background

By letter dated June 20, 2017 (ML17171A151), the licensee submitted to the NRC a certification of permanent cessation of power operations for the facility. By letter dated September 26, 2019 (ML19269E480), the licensee submitted to the NRC a certification of permanent removal of fuel from the reactor vessel for the facility. Per Title 10 of the *Code of Federal Regulations* (10 CFR) 50.82, "Termination of license," paragraph (a)(2), upon the docketing of these certifications, the facility's license no longer authorized operation of the reactor or emplacement or retention of fuel into the reactor vessel.

By letter dated August 29, 2019 (ML19211D317), in response to an LAR dated July 25, 2018 (ML18206A545), as supplemented by letter dated March 6, 2019 (ML19065A217), the NRC staff issued Amendment No. 297 to the facility's license. This amendment changed, among other things, LC 2.b.(2). Part of the change to LC 2.b.(2) was to limit the licensee's authority to the possession of used fuel and used reactor start up sources. By letter dated April 19, 2022 (ML22081A231), in response to an LAR dated December 16, 2020 (ML20351A451), as supplemented by letter dated March 28, 2022 (ML22087A394), the NRC staff issued Amendment No. 304 to the facility's license. This amendment removed the last vestiges of nuclear fuel, fresh or spent, storage authority from the licensee. By letter dated July 27, 2022 (ML22208A093), the licensee submitted to the NRC a certification of the effective date of Amendment No. 304.

By letter dated June 7, 2022 (ML22074A131, corrected by ML22234A220), in response to an LAR dated April 29, 2021 (ML21145A183), the NRC staff issued Amendment No. 305 to the facility's license. By letter dated October 25, 2022 (ML22299A002), the licensee notified the NRC that the facility's "Independent Spent Fuel Storage Installation Security Plan, Training and Qualification Plan, and Safeguards Contingency Plan" was implemented on August 30, 2022.

By letter dated November 4, 2024 (ML24310A104), the licensee submitted to the NRC a regulatory path to reauthorize power operations at the facility in accordance with Inspection Manual Chapter 2562, "Light-Water Reactor Inspection Program for Restart of Reactor Facilities Following Permanent Cessation of Power Operations" (ML25017A231).

In the instant LAR, the licensee is requesting that the licensing basis in effect prior to the cessation of power operations at the facility with respect to the receipt, possession, and storage of fresh unirradiated fuel be restored. To accommodate this request, the licensee would have to establish reasonable assurance that the related controls have been reestablished and that the related structures, systems, and components (SSCs) are either in the same condition or would be restored before the receipt of fresh unirradiated fuel. To facilitate its review of the LAR, the NRC staff conducted an audit (ML25227A151) of primarily non-docketed information with the intent to gain understanding, to verify information, and to identify information that will require docketing to support the staff's evaluation of the LAR. The audit was closed on issuance of the NRC staff's request for additional information (RAI) dated March 9, 2026 (ML26071A170). An audit summary report was issued on June 8, 2026 (ML26148A223).

1.2 The Licensee's Proposed Changes

The licensee's proposed changes to the facility's license are limited to authorizing the receipt, possession, and storage of new nuclear fuel and new sealed neutron sources at the facility; 10 CFR 50.82(a)(2) would still provide that the facility's license does not authorize operation of

the reactor or emplacement or retention of fuel into the reactor vessel. To this end the licensee proposes revising existing LC 2.b.(2) and adding new LCs 2.c.(23) and 2.c.(24).

Currently, LC 2.b.(2) states:

- (2) Constellation Energy Generation, LLC pursuant to the Act and 10 CFR Parts 30, 40 and 70 to possess at any time any byproduct, source and special nuclear material used previously as reactor fuel, sealed neutron sources used previously for reactor startup, as fission detectors, and sealed sources for reactor instrumentation and to possess and use at any time any byproduct, source and special nuclear material as sealed sources for radiation monitoring equipment calibration in amounts as required;

The licensee proposes revising LC 2.b.(2) as shown below (additions in italics and deletions in strike-through):

- (2) Constellation Energy Generation, LLC pursuant to the Act and 10 CFR Parts 30, 40 and 70 to *receive and* possess at any time any byproduct, source and special nuclear material ~~used previously~~ as reactor fuel, sealed neutron sources ~~used previously~~ for reactor startup, as fission detectors, and sealed sources for reactor instrumentation and to possess and use at any time any byproduct, source and special nuclear material as sealed sources for radiation monitoring equipment calibration in amounts as required;

The licensee also proposes adding new LCs 2.c.(23) and 2.c.(24) as shown below:

- (23) Prior to receiving new fuel, the programs, procedures, and systems, structures, and components necessary to support receipt and storage of new reactor fuel and sealed neutron sources, as documented in CEG's response to requests for additional information dated April 2, 2026 (ML26092A068), will be restored such that there is reasonable assurance that the activities authorized by License Condition 2.b.(2) will continue to be conducted in accordance with the current defueled licensing basis.
- (24) New fuel may be stored in the new fuel storage vault, spent fuel pools, or shipping containers.
 - Prior to loading new fuel and whenever there is fuel in the pool, the spent fuel pool is filled to at least the 343'6" elevation with water borated to the concentration of at least 600ppm. The boron concentration and fuel pool level will be verified prior to moving fuel in or over the spent fuel pool and every 7 days while fuel is in the pool. If boron concentration is below 600ppm, fuel movement in or over the spent fuel pool will stop and concentration will be restored prior to recommencing fuel movement. If spent fuel pool level is below the 343'6" elevation, actions to restore fuel pool level will be initiated.
 - For the new fuel storage vault, the fuel assemblies are stored in racks in parallel rows, having a nominal center to center distance of 21-1/8 inches in both directions.
 - When fuel is being stored in the new fuel storage vault, twelve (12) storage locations (aligned in two rows of six locations each; traverse row numbers four and eight) must be left vacant of fissile or moderating material to provide sufficient neutron leakage to satisfy the

NRC maximum allowable reactivity value under the optimum low moderator density condition.

- The new fuel storage vault will store new fuel with enrichment not to exceed 5.0 WT% U-235.
- For Spent Fuel Pool "A", the fuel assemblies are stored in racks in parallel rows, having a nominal center to center distance of 11.1 inches in both directions for the Region I racks.
 - Region I will store new fuel with enrichment not to exceed 5.0 WT% U-235.
 - No new fuel will be stored in Region II.
- For Spent Fuel Pool "B", the fuel assemblies are stored in racks in parallel rows, having nominal center to center distance of 13-5/8 inches in both directions.
 - Fuel Pool B will store new fuel with enrichment not to exceed 4.37 WT% U-235.

2.0 REGULATORY EVALUATION

The regulatory requirements and guidance that the NRC staff considered in assessing the proposed changes are as follows.

Per 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," whenever a holder of a license desires to amend the license, application for an amendment must be filed with the NRC fully describing the changes desired and following as far as applicable, the form prescribed for original applications. Per 10 CFR 50.92, "Issuance of amendment," paragraph (a), in determining whether an amendment to a license will be issued to the applicant, the NRC will be guided by the considerations that govern the issuance of initial licenses to the extent applicable and appropriate. Both 10 CFR 50.40, "Common standards," paragraph (a) and 10 CFR 50.57, "Issuance of operating license," paragraph (a)(3) provide that there must be reasonable assurance that the activities at issue will not endanger the health and safety of the public and that the applicant will conduct such activities in compliance with the Commission's regulations.

The facility was substantially constructed prior to the issuance of 10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants." The facility was designed and constructed taking into consideration the proposed Atomic Energy Commission General Design Criteria as published in the *Federal Register* in July 1967 (32 FR 10213). The facility's Principal Design Criterion 66, "Prevention of Fuel Storage Criticality (Category B)," states that criticality in new and spent fuel storage shall be prevented by physical systems or processes. Such means as geometrically safe configurations shall be emphasized over procedural controls (ML19066A367).

Per 10 CFR 50.68, "Criticality accident requirements," paragraph (a), each holder of an operating license for a nuclear power reactor shall comply with either 10 CFR 70.24, "Criticality accident requirements," or the requirements in 10 CFR 50.68(b). The licensee has elected to comply with the requirements in 10 CFR 50.68(b). Accordingly, and as relevant to this LAR, the licensee must comply with the following 10 CFR 50.68(b) requirements:

- (1) Plant procedures shall prohibit the handling and storage at any one time of more fuel assemblies than have been determined to be safely subcritical under the most adverse moderation conditions feasible by unborated water.
- (2) The estimated ratio of neutron production to neutron absorption and leakage (k-effective) of the fresh fuel in the fresh fuel storage racks shall be calculated assuming the racks are loaded with fuel of the maximum fuel assembly reactivity and flooded with unborated water and must not exceed 0.95, at a 95 percent probability, 95 percent confidence level. This evaluation need not be performed if administrative controls and/or design features prevent such flooding or if fresh fuel storage racks are not used.
- (3) If optimum moderation of fresh fuel in the fresh fuel storage racks occurs when the racks are assumed to be loaded with fuel of the maximum fuel assembly reactivity and filled with low-density hydrogenous fluid, the k-effective corresponding to this optimum moderation must not exceed 0.98, at a 95 percent probability, 95 percent confidence level. This evaluation need not be performed if administrative controls and/or design features prevent such moderation or if fresh fuel storage racks are not used.
- (4) If no credit for soluble boron is taken, the k-effective of the spent fuel storage racks loaded with fuel of the maximum fuel assembly reactivity must not exceed 0.95, at a 95 percent probability, 95 percent confidence level, if flooded with unborated water. If credit is taken for soluble boron, the k-effective of the spent fuel storage racks loaded with fuel of the maximum fuel assembly reactivity must not exceed 0.95, at a 95 percent probability, 95 percent confidence level, if flooded with borated water, and the k-effective must remain below 1.0 (subcritical), at a 95 percent probability, 95 percent confidence level, if flooded with unborated water.
- (5) The quantity of SNM, other than nuclear fuel stored onsite, is less than the quantity necessary for a critical mass.
- (6) Radiation monitors are provided in storage and associated handling areas when fuel is present to detect excessive radiation levels and to initiate appropriate safety actions.
- (7) The maximum nominal U-235 enrichment of the fresh fuel assemblies is limited to five (5.0) percent by weight.
- (8) The FSAR is amended no later than the next update which [10 CFR] 50.71(e) ... requires, indicating that the licensee has chosen to comply with [10 CFR] 50.68(b).

The categories of items required to be in technical specifications (TSs) are provided in 10 CFR 50.36, "Technical specifications," paragraph (c). Per 10 CFR 50.36(c)(6), "Decommissioning," for nuclear power reactor facilities that have submitted the certifications required by 10 CFR 50.82(a)(1), technical specifications involving safety limits, limiting safety system settings, and limiting control system settings; limiting conditions for operation; surveillance requirements; design features; and administrative controls will be developed on a case-by-case basis.

Per 10 CFR 50.9, "Completeness and accuracy of information," paragraph (a), the "[i]nformation provided to the Commission by an applicant for a license or by a licensee or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant or the licensee shall be complete and accurate in all material respects."

Per 10 CFR 73.55, "Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage," paragraph (a)(4), licensees "shall implement the requirements of this section before fuel is allowed onsite (protected area)."

The requirements in 10 CFR 73.67, "Licensee fixed site and in-transit requirements for the physical protection of special nuclear material of moderate and low strategic significance," paragraph (a) state:

(a) General performance objectives.

- (1) Each licensee who possesses, uses or transports special nuclear material of moderate or low strategic significance shall establish and maintain a physical protection system that will achieve the following objectives:
 - (i) Minimize the possibilities for unauthorized removal of special nuclear material consistent with the potential consequences of such actions; and
 - (ii) Facilitate the location and recovery of missing special nuclear material.
- (2) To achieve these objectives, the physical protection system shall provide:
 - (i) Early detection and assessment of unauthorized access or activities by an external adversary within the controlled access area containing special nuclear material;
 - (ii) Early detection of removal of special nuclear material by an external adversary from a controlled access area;
 - (iii) Assure proper placement and transfer of custody of special nuclear material; and
 - (iv) Respond to indications of an unauthorized removal of special nuclear material and then notify the appropriate response forces of its removal in order to facilitate its recovery.

The requirements in 10 CFR 73.67(c) state, in part:

- (c) Each licensee who possesses, uses, transports, or delivers to a carrier for transport special nuclear material of moderate strategic significance, or 10 kg or more of special nuclear material of low strategic significance shall:
 - (1) Submit a security plan or an amended security plan describing how the licensee will comply with all the requirements of paragraphs (d), (e), (f), and (g) of this section, as appropriate, including schedules of implementation....

Per 10 CFR 73.67(f), "Fixed site requirements for special nuclear material of low strategic significance," each licensee who possesses, stores, or uses special nuclear material of low strategic significance at a fixed site or contiguous sites, except those who are licensed to

operate a nuclear power reactor pursuant to part 50, provided that the special nuclear material is located within a protected area and protected under 10 CFR 73.55 or 10 CFR 73.100, shall:

- (1) Store or use the material only within a controlled access area,
- (2) Monitor with an intrusion alarm or other device or procedures the controlled access areas to detect unauthorized penetrations or activities,
- (3) Assure that a watchman or offsite response force will respond to all unauthorized penetrations or activities, and
- (4) Establish and maintain response procedures for dealing with threats of thefts or thefts of this material....

The requirements in 10 CFR 73.67(g)(2) state that each licensee who receives quantities and types of special nuclear material of low strategic significance shall:

- (i) Check the integrity of the containers and seals upon receipt of the shipment,
- (ii) Notify the shipper of receipt of the material as required in [10 CFR] 74.15..., and
- (iii) Arrange for the in-transit physical protection of the material in accordance with the requirements of [10 CFR] 73.67(g)(3)...., unless the shipper is a licensee and has agreed in writing to arrange for the in-transit physical protection.

Regulatory Guide 5.59, Revision 1, "Standard Format and Content for a Licensee Physical Security Plan for the Protection of Special Nuclear Material of Moderate or Low Strategic Significance," dated February 1983 (ML100341301), provides guidance to assist applicants and licensees in planning a physical protection program designed to detect the theft of SNM of moderate or low strategic significance.

3.0 TECHNICAL EVALUATION

3.1 Evaluation of the Licensee's Proposed Changes for Prevention of Fuel Storage Criticality

3.1.1 Method of Review

The method of review for the LAR is unique because the licensee had previously permanently shut down the facility, removed all fuel from the spent fuel pool (SFP), drained the SFP, and deleted TSs associated with the storage and handling of reactor fuel and is now in the process of attempting to restart power operations at the facility. The LAR addresses a small portion of the actions needed to support the restart of power operations at the facility. Specifically, the LAR is limited to the actions necessary for the licensee to receive and store new unirradiated fuel at the facility. The licensee does not provide in the LAR an analysis to support a restoration of the deleted TSs related to fuel storage. Rather, the licensee is relying on restoring the SSCs and procedures and administrative controls related to the safe storage of unirradiated fuel to the same state or condition that they were in prior to the cessation of power operations. The NRC staff review reasonably assumes that the licensee was fully compliant with the requirements of

10 CFR 50.68(b) and 10 CFR 50.36 regarding the possession and storage of unirradiated fuel at the time of shutdown.

Based on the above, the NRC staff review is intended to determine whether there is reasonable assurance that the licensee's proposed restorative actions, with respect to the receipt and storage of new unirradiated fuel, will return the facility to a state or condition that was in place prior to the docketing of the certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel. Accordingly, there are three main aspects to the NRC staff's review:

- Restoring appropriate SSCs,
- Restoring appropriate TS requirements, procedures, and training, and
- Determining compliance with 10 CFR 50.68.

3.1.2 Restoring Appropriate Systems, Structures, and Components

Since September 2019, the licensee has performed numerous activities associated with the permanent cessation of power operations at the facility, including, but not limited to, the removal of all fuel and the draining of all water from the SFP. These actions may have impacted the licensee's ability to demonstrate compliance with 10 CFR 50.68(b) and 10 CFR 50.36 regarding the possession and storage of unirradiated fuel because some of the SSCs may have been modified or removed and other SSCs may have experienced deleterious effects from being idle or in various layup conditions.

The licensee has developed extensive plans for restoring all SSCs necessary for the resumption of power operations at the facility. A subset of these SSCs will need to be restored prior to any receipt of fresh fuel. In its supplemental letter dated April 2, 2026, the licensee stated that the SSCs needed to be restored prior to any receipt of fresh fuel are listed in Table 1, "New Fuel Receipt SSCs." The NRC staff determined that the subject SSCs may have functions not pertinent to the receipt of new fuel and that, therefore, those functions do not need to be restored prior to any receipt of new fuel. As part of its audit, the NRC staff reviewed the licensee's plans for restoring the identified SSCs. The NRC staff discussed these plans with the NRC inspectors that are overseeing the restart activities and confirmed that these SSCs are subject to the restart inspection activities being performed at the facility. Additionally, the licensee proposed LC 2.c.(23), which would incorporate into the facility's license a requirement to restore the SSCs identified in Table 1 prior to receiving new fuel. Taken together, the NRC staff concludes that there is reasonable assurance that the necessary SSCs will be restored to support the possession and storage of unirradiated fuel at the facility consistent with NRC regulations.

3.1.3 Restoring Appropriate TS Requirements, Procedures, and Training

Amendment No. 304 to the facility's license removed the last vestiges of authority for nuclear fuel, fresh or irradiated, storage at the facility. With the LAR, the licensee is requesting that the licensing basis in effect prior to the permanent cessation of power operations, with respect to the receipt, possession, and storage of fresh unirradiated fuel, be restored.

In the LAR, the licensee proposed only to restore TS 5.4.1, "New Fuel Storage," to reestablish in the license the design features of the A and B SFPs and the new fuel storage vault necessary for compliance with 10 CFR 50.68. This TS was proposed to be restored consistent with the last approved change to it by Amendment No. 170, with additional minor editorial changes.

However, during its review of the LAR, the NRC staff noted that the licensee did not also propose to restore the TS requirements, such as the surveillance requirement in TS Table 4.1-3, item 4 for the SFP boron concentration sample, that were applicable to the storage of new fuel and that were in the last revision of the operating TSs. During the NRC staff audit, the licensee identified that the necessary requirements are included in various sections of the TSs and in licensee-controlled programs (such as the Surveillance Frequency Control Program). Further, as the LAR is not requesting to place fuel in the reactor vessel, it was determined that restoring the full operating licensing basis before receiving new fuel, including all TSs and programs consistent with the last revision of the operating TSs, is not practical or needed.

In its supplemental letter dated April 2, 2026, the licensee identified the necessary SSCs, procedures, and programs needed to be restored or completed prior to any receipt of new fuel at the facility and incorporated them into a new proposed LC 2.c.(23). Additionally, the licensee extracted the applicable portions of TS 5.4.1 and incorporated the SFP level requirements, SFP boron concentration sampling requirements, and actions if SFP level or boron concentration requirements are not met into a new proposed LC 2.c.(24).

Pursuant to 10 CFR 50.36(c)(6), for facilities that have submitted the certifications required by 10 CFR 50.82(a)(1), such as the CCEC, TSs are developed on a case-by-case basis. In this case, the NRC staff determined that the new proposed LCs 2.c.(23) and 2.c.(24) are acceptable because they establish the necessary requirements for the receipt and storage of new reactor fuel. Additionally, the NRC staff determined that the CCEC will remain in a decommissioned status until the NRC staff approves and the licensee implements the additional licensing actions necessary to support the restart of the facility.

The new proposed LC 2.b.(24) delineates the following storage requirements:

- The SFP will be filled with water to at least the 343' 6" elevation,
- The water in the SFP will be borated to the concentration of at least 600 ppm,
- The SFP water level and the boron concentration will be verified before moving fuel in or over the SFP and every 7 days while fuel is in the SFP,
- Fuel movement in or over the SFP will be stopped if either the SFP water level or the boron concentration is out of specification, and won't resume until they are in specification,
- The SFP A has two regions: Region I and Region II
 - Both regions have an 11.1-inch pitch between fuel assemblies
 - Region I will store fresh fuel with enrichment not to exceed 5.0 wt/% U²³⁵
 - No new fuel will be stored in Region II
- The SFP B has one region:
 - The SFP B has a 13-5/8-inch pitch between fuel assemblies
 - The SFP B will store fresh fuel with enrichment not to exceed 4.37 wt/% U²³⁵
- The new fuel storage vault has one region:
 - The new fuel storage vault has a 21-1/8-inch pitch between fuel assemblies,
 - The new fuel storage vault will store fresh fuel with enrichment not to exceed 5.0 wt/% U²³⁵
 - The new fuel storage vault has a specific loading pattern.

The NRC staff determined that these requirements are consistent with the requirements at the facility prior to the submission of the certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel.

Based on the above, the NRC staff concludes that LCs 2.c.(23) and 2.c.(24) provide reasonable assurance that the appropriate TS requirements, procedures, and training would be restored prior to any receipt of fresh fuel.

3.1.4 Compliance with 10 CFR 50.68(b)

Under 10 CFR 50.68(a), the licensee has elected to pursue compliance with 10 CFR 50.68(b) instead of 10 CFR 70.24. In its supplemental letter dated April 2, 2026, the licensee identified how the CCEC will meet paragraphs (1) through (8) of 10 CFR 50.68(b). The NRC staff reviewed the information and found it to be an acceptable means of demonstrating compliance with all portions of 10 CFR 50.68(b). This is because the licensee would meet 10 CFR 50.68(b) by establishing in the license the same requirements to prevent a criticality accident in the SFP as those that were in place prior to the submission of the certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel.

3.1.5 Sealed Neutron Sources

In addition to the receipt and storage of fresh fuel, the licensee would require the receipt and storage of new sealed neutron sources at the CCEC to achieve initial criticality of the reactor. Accordingly, the licensee proposes to change LC 2.b.(2) to allow the receipt and possession of new sealed neutron sources for reactor startup. As previously noted, however, the changes proposed by the LAR would not allow the licensee to use the new fuel or new sealed neutron sources. The NRC staff determined that this change effectively reestablishes these aspects of the CCEC license that existed prior to the submission of the certifications of permanent cessation of operations and permanent removal of fuel from the reactor vessel and, therefore, it is acceptable.

3.1.6 Conclusion on the Licensee's Proposed Changes for Prevention of Fuel Storage Criticality

The above sections demonstrate that the information provided by the licensee under 10 CFR 50.9(a) provides reasonable assurance that the licensee will appropriately restore its pre-decommissioning licensing basis with respect to the possession and storage of fresh unirradiated fuel and new sealed neutron sources for reactor startup. Therefore, the NRC staff concludes that the LAR is acceptable.

3.2 Evaluation of the Licensee's Physical Security Posture to Possess Special Nuclear Material

The licensee intends to possess SNM of low strategic significance prior to any full restoration of the operating licensing basis at the CCEC. Therefore, before implementing the requirements of 10 CFR 73.55, the licensee must comply with the applicable requirements of 10 CFR 73.67 for the protection of SNM. Specifically, the licensee must meet the requirements outlined in 10 CFR 73.67(a), (c), (f) and (g).

3.2.1 General Performance Objectives

Pursuant to 10 CFR 73.67(a), a licensee who possesses, uses, or transports SNM of moderate or low strategic significance must establish and maintain a physical protection system that will achieve general performance objectives.

The NRC staff reviewed the LAR and determined that it adequately describes how the licensee meets the performance objectives in 10 CFR 73.67(a). The LAR discusses specific methods, outlined below, that the licensee uses to meet the performance objectives in 10 CFR 73.67(a).

3.2.2 Security Plan Requirements

The regulations at 10 CFR 73.67(c) require licensees that possess, use, transport, or deliver to a carrier 10 kg or more of SNM of low strategic significance to submit a security plan or an amended security plan describing how the licensee will comply with the applicable requirements of 10 CFR 73.67.

The LAR did not include a security plan for the CCEC. On March 9, 2026, the NRC staff issued an RAI requesting, in part, a copy of the security plan for the CCEC. By supplemental letter dated April 2, 2026, the licensee submitted to the NRC the "Crane Clean Energy Center Unit 1, Part 37 Security Plan for the Protection of Category 1 and Category 2 Quantities of Radioactive Material and 73.67 Protection of Special Nuclear Material of Moderate and Low Significance Security Plan," Revision 5, dated November 10, 2025 (hereafter, "Materials Security Plan") (non-publicly available). The Materials Security Plan describes how the licensee protects Category 1 and Category 2 quantities of radioactive material in accordance with 10 CFR Part 37 and addresses the protection of SNM of moderate and low strategic significance in accordance with 10 CFR 73.67.

The NRC staff reviewed the Materials Security Plan and determined that it meets the requirement of 10 CFR 73.67(c) for submitting a security plan or amended security plan.

3.2.3 Fixed Site Requirements for Special Nuclear Material of Low Strategic Significance

3.2.3.1 *Use and Storage*

The regulations at 10 CFR 73.67(f)(1) require licensees to store or use SNM of low strategic significance only within a controlled access area.

Section 3.3, "Storage," of the Materials Security Plan describes storage locations for SNM at the CCEC and designates them as controlled access areas.

The NRC staff reviewed the Materials Security Plan and determined that Section 3.3 of the plan adequately describes how the licensee meets 10 CFR 73.67(f)(1) regarding the storage and use of SNM of low strategic significance.

3.2.3.2 *Detection and Assessment*

The regulations at 10 CFR 73.67(f)(2) require licensees to monitor the controlled access areas with an intrusion alarm or other device or procedures to detect unauthorized penetrations or activities.

Section 3.4, "Monitoring," of the Materials Security Plan describes the monitoring of security zones. The licensee uses multiple methods to monitor security zones and controlled access areas to ensure the detection of unauthorized penetrations or activities.

The NRC staff reviewed the Materials Security Plan and determined that Section 3.4 of the plan adequately describes how the licensee meets 10 CFR 73.67(f)(2) regarding the monitoring of controlled access areas.

3.2.3.3 *Response*

The regulations at 10 CFR 73.67(f)(3) require licensees to assure that a watchman or offsite response force will respond to all unauthorized penetrations or activities.

Section 3.5, "Staffing," of the Materials Security Plan describes onsite personnel who assess unauthorized penetrations or activities and response agreements with local law enforcement agencies.

The NRC staff reviewed the Materials Security Plan and determined that Section 3.5 of the plan adequately describes how the licensee meets 10 CFR 73.67(f)(3) regarding responding to unauthorized penetrations or activities.

3.2.3.4 *Response Procedures*

The regulations at 10 CFR 73.67(f)(4) require licensees to establish and maintain response procedures for dealing with threats of thefts or thefts of SNM. The licensee shall retain a copy of the current response procedures as a record for 3 years after the close of period for which the licensee possesses the SNM under each license for which the procedures were established. Copies of superseded material must be retained for 3 years after each change.

Section 3.6, "Response Procedures," of the Materials Security Plan states that the licensee has procedures for addressing threats of theft or actual thefts of SNM and retains copies of the procedures as required.

The NRC staff reviewed the Materials Security Plan and determined that Section 3.6 of the plan adequately describes how the licensee meets 10 CFR 73.67(f)(4) regarding response procedures and record retention.

3.2.4 In-Transit Requirements for Special Nuclear Material of Low Strategic Significance

The regulations at 10 CFR 73.67(g)(2) require, in part, that a licensee who receives quantities and types of SNM of low strategic significance to check the integrity of the container and seals upon receipt of a shipment and to notify the shipper of receipt of the material.

The NRC staff identified that the Materials Security Plan did not address the requirements of 10 CFR 73.67(g)(2) for (1) verifying container and seal integrity upon receipt of SNM of low strategic significance and (2) notifying the shipper of receipt of the material. Through its audit and RAI, the NRC staff requested documentation of the licensee's processes and procedures in place to satisfy these requirements of 10 CFR 73.67(g)(2).

By supplemental letter dated April 2, 2026, the licensee provided the fleet and site procedures demonstrating that the CCEC has established processes that meet the requirements of 10 CFR 73.67(g)(2). Specifically, procedures SYAA101112105 and SYAA101110 describe steps for verifying tamper indicating devices, reconciling tamper indicating device numbers with shipping

documentation, evaluating container integrity, and denying entry if discrepancies are identified. Procedure NFAA3001000 describes notification of the shipper through the completion and transmittal of the Nuclear Material Transaction Report (Department of Energy/NRC Form 741).

The NRC staff reviewed the LAR, as supplemented, and determined that it identifies applicable procedures that adequately describe how the licensee meets 10 CFR 73.67(g)(2) regarding in-transit requirements.

3.2.5 Conclusion on the Licensee's Physical Security Posture to Possess Special Nuclear Material

The NRC staff reviewed the LAR seeking to revise Renewed Facility License No. DPR-50 for the CCEC to allow for the receipt and possession of new reactor fuel and sealed neutron sources prior to any restoration of the facility's operating licensing basis. As discussed above, because the licensee intends to possess SNM of low strategic significance before implementing 10 CFR 73.55 requirements at the CCEC, the licensee must comply with the applicable requirements of 10 CFR 73.67. The licensee's Materials Security Plan and supporting procedures document the method by which the licensee addresses the applicable requirements of 10 CFR 73.67. Based on its review, the NRC staff determined that the Materials Security Plan and supporting procedures meet the applicable requirements of 10 CFR 73.67. Therefore, the NRC staff concludes that proper implementation of this plan and these procedures will provide reasonable assurance that activities involving SNM are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Commonwealth of Pennsylvania official was notified of the proposed issuance of the amendment on June 1, 2026. The Commonwealth official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

This action relates to authorizations under 10 CFR Part 50 with respect to installation or use of a facility component. The NRC staff has determined that any ground disturbance is limited to previously disturbed areas. Additionally, the NRC staff has determined that the action involves no significant change in the types or significant increase in the amounts of any effluents that may be released offsite, no significant increase in individual or cumulative public or occupational radiation exposure, and no significant increase in the potential for or consequences from radiological accidents. Specifically, based on the analysis documented in Section 4.14.1.4 of Revision 2 of NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (ML24087A133), the NRC staff concluded that the values given in Table 4.14-2 (Table S-4 in 10 CFR 51.52) would still be bounding, as long as the (1) enrichment of the fresh fuel was 5 percent or less, (2) burnup of the spent fuel was 62,000 megawatt-days per metric ton of uranium (MWd/MTU) or less, and (3) higher-burnup spent fuel (higher than 33,000 MWd/MTU) was cooled for at least 5 years before being shipped offsite. In NUREG-2266, "Environmental Evaluation of Accident Tolerant Fuels with Increased Enrichment and Higher Burnup Levels" (ML24207A210), the NRC staff evaluated the impacts to the uranium fuel cycle for up to 10 weight-percent (wt%) uranium-235 and transportation of fuel and waste for up to 8 wt% uranium-235 and burnup levels up to 80 gigawatt-days per metric ton of uranium (GWd/MTU). The analysis in NUREG-2266 demonstrates that 10 CFR 51.52(c), Table S-4, is still bounding under these conditions. Therefore, the environmental impacts of shipping

unirradiated nuclear fuel to the CCEC would not be significant by meeting the conditions and analyses provided in Revision 2 of NUREG-1437 and NUREG-2266. As a result, the NRC staff has determined that a categorical exclusion applies and that special circumstances under 10 CFR 51.22, "Categorical exclusions," are not present that would preclude reliance on the categorical exclusion. Accordingly, this action meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(d)(8). Pursuant to 10 CFR 51.22, no environmental impact statement or environmental assessment need be prepared in connection with the action.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: July 1, 2026

SUBJECT: CHRISTOPHER M. CRANE CLEAN ENERGY CENTER – ISSUANCE OF
AMENDMENT NO. 307 RE: LICENSE AMENDMENT REQUEST TO REVISE
LICENSE TO ALLOW RECEIPT OF NEW REACTOR FUEL
(EPID L-2025-LLA-0102) DATED JULY 1, 2026

DISTRIBUTION:

Public	RidsRgn1MailCenter Resource
RidsACRS_MailCTR Resource	RidsNrrDorLpl3 Resource
RidsNrrDssSfnb Resource	RidsNmssDuwpRdb Resource
RidsNsirMailCenter Resource	KWood, NRR
RidsNrrLASLent Resource	SSmith, NRR
RidsNrrPMCraneCleanEnergyCenter Resource	SSarver, NSIR

ADAMS Accession Nos.:

Package: ML26135A001

Amendment: ML26135A004

eConcurrence Case: 20260515-80023