



## NUCLEAR REGULATORY COMMISSION

[Docket Nos. 72-53, 50-254, and 50-265; NRC-2024-0074]

Constellation Energy Generation, LLC.;

Quad Cities Nuclear Power Station, Units 1 and 2;

Independent Spent Fuel Storage Installation;

Exemption

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Notice; issuance.

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC) issued an exemption to Constellation Energy Generation, LLC. that permits Quad Cities Nuclear Power Station (QCNPS) to load four model 68M multi-purpose canisters with continuous basket shims beginning June 2024 in the HI-STORM 100 Cask System at its QCNPS Units 1 and 2 independent spent fuel storage installation in a storage condition where the terms, conditions, and specifications in the Certificate of Compliance No. 1014, Amendment No. 8, Revision No. 1 are not met.

**DATES:** The exemption was issued on April 30, 2024.

**ADDRESSES:** Please refer to Docket ID **NRC-2024-0074** when contacting the NRC about the availability of information regarding this document. You may obtain publicly available information related to this document using any of the following methods:

- **Federal Rulemaking Website:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2024-0074**. Address questions about Docket IDs in Regulations.gov to Stacy Schumann; telephone: 301-415-0624; email: [Stacy.Schumann@nrc.gov](mailto:Stacy.Schumann@nrc.gov). For technical questions, contact the individual listed in the "For Further Information Contact" section of this document.

- **NRC's Agencywide Documents Access and Management System**

**(ADAMS):** You may obtain publicly available documents online in the ADAMS Public

Documents collection at <https://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "Begin Web-based ADAMS Search." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, at 301-415-4737, or by email to [PDR.Resource@nrc.gov](mailto:PDR.Resource@nrc.gov). The ADAMS accession number for each document referenced (if it is available in ADAMS) is provided the first time that it is mentioned in this document.

- **NRC's PDR:** The PDR, where you may examine and order copies of publicly available documents, is open by appointment. To make an appointment to visit the PDR, please send an email to [PDR.Resource@nrc.gov](mailto:PDR.Resource@nrc.gov) or call 1-800-397-4209 or 301-415-4737, between 8 a.m. and 4 p.m. eastern time (ET), Monday through Friday, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Yen-Ju Chen, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555; telephone: 301-415-1018; email: [Yen-Ju.Chen@nrc.gov](mailto:Yen-Ju.Chen@nrc.gov).

**SUPPLEMENTARY INFORMATION:** The text of the exemption is attached.

Dated: May 3, 2024.

For the Nuclear Regulatory Commission.

**Yaira Diaz-Sanabria,**  
*Chief,  
Storage and Transportation Licensing  
Branch,  
Division of Fuel Management,  
Office of Nuclear Material Safety,  
and Safeguards.*

**Attachment – Exemption.**

**NUCLEAR REGULATORY COMMISSION**

**Docket Nos. 72-53, 50-254, and 50-265**

**Constellation Energy Generation, LLC**

**Quad Cities Nuclear Power Station Units 1 and 2**

**Independent Spent Fuel Storage Installation;**

**I. Background**

Constellation Energy Generation, LLC (Constellation) is the holder of Renewed Facility Operating License Nos. DPR-29 and DPR-30, which authorize operation of the Quad Cities Nuclear Power Station, Units 1 and 2 (QCNPS) in Cordova, Illinois, pursuant to Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR), “Domestic Licensing of Production and Utilization Facilities.” The licenses provide, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC) now or hereafter in effect.

Consistent with 10 CFR part 72, subpart K, “General License for Storage of Spent Fuel at Power Reactor Sites,” a general license is issued for the storage of spent fuel in an Independent Spent Fuel Storage Installation (ISFSI) at power reactor sites to persons authorized to possess or operate nuclear power reactors under 10 CFR part 50. Constellation is authorized to operate nuclear power reactors under 10 CFR part 50 and holds a 10 CFR part 72 general license for storage of spent fuel at the QCNPS ISFSI. Under the terms of the general license, Constellation stores spent fuel at its QCNPS ISFSI using the HI-STORM 100 Cask System in accordance with Certificate of Compliance (CoC) No. 1014, Amendment No. 8, Revision No. 1.

**II. Request/Action**

By a letter dated March 15, 2024 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML24075A001), Constellation requested an exemption from the requirements of 10 CFR §§ 72.212(a)(2), 72.212(b)(3), 72.212(b)(5)(i), 72.212(b)(11), and 72.214 that require QCNPS to comply with the terms,

conditions, and specifications of the CoC No. 1014, Amendment No. 8, Revision No. 1 (ML16041A233). If approved, Constellation's exemption request would accordingly allow QCNPS to load four Multi-Purpose Canisters (MPC) with an unapproved variant basket design with continuous basket shims (CBS) (i.e., MPC-68M-CBS) in the HI-STORM 100 Cask System, beginning June 2024, and thus, to load the systems in a storage condition where the terms, conditions, and specifications in the CoC No. 1014, Amendment No. 8, Revision No. 1 are not met.

Constellation currently uses the HI-STORM 100 Cask System under CoC No. 1014, Amendment No. 8, Revision No. 1, for dry storage of spent nuclear fuel in MPC-68M at the QCNPS ISFSI. Holtec International (Holtec), the designer and manufacturer of the HI-STORM 100 Cask System, developed a variant of the design with CBS for the MPC-68M, known as MPC-68M-CBS. Holtec performed a non-mechanistic tip-over analysis with favorable results and implemented the CBS variant design under the provisions of 10 CFR 72.48, "Changes, tests, and experiments," which allows licensees to make changes to cask designs without a CoC amendment under certain conditions (listed in 10 CFR 72.48(c)). After evaluating the specific changes to the cask designs, the NRC determined that Holtec erred when it implemented the CBS variant design under 10 CFR 72.48, as this is not the type of change allowed without a CoC amendment. For this reason, the NRC issued three Severity Level IV violations to Holtec (ML24016A190).

Constellation's near-term loading campaign for the QCNPS ISFSI includes loading four MPC-68M-CBS in the HI-STORM 100 Cask System beginning in June 2024. While Holtec was required to submit a CoC amendment to the NRC to seek approval of the CBS variant design, such a process will not be completed in time to inform decisions for this near-term loading campaign. Therefore, Constellation submitted this exemption request to allow for the future loading of four new MPC-68M-CBS beginning in June 2024, at the QCNPS ISFSI. This exemption is limited to the use of

four MPC-68M-CBS in the HI-STORM 100 Cask System for the specific near-term planned loading beginning June 2024.

### **III. Discussion**

Pursuant to 10 CFR 72.7, “Specific exemptions,” the Commission may, upon application by any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations of 10 CFR part 72 as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

#### **A. The Exemption is Authorized by Law**

This exemption would allow Constellation to load four MPC-68M-CBS in the HI-STORM 100 Cask System beginning June 2024 at its QCNPS ISFSI in a storage condition where the terms, conditions, and specifications in the CoC No. 1014, Amendment No. 8, Revision No. 1, are not met. Constellation is requesting an exemption from the provisions in 10 CFR part 72 that require the licensee to comply with the terms, conditions, and specifications of the CoC for the approved cask model it uses. Section 72.7 allows the NRC to grant exemptions from the requirements of 10 CFR part 72. This authority to grant exemptions is consistent with the Atomic Energy Act of 1954, as amended, and is not otherwise inconsistent with NRC’s regulations or other applicable laws. Additionally, no other law prohibits the activities that would be authorized by the exemption. Therefore, the NRC concludes that there is no statutory prohibition on the issuance of the requested exemption, and the NRC is authorized to grant the exemption by law.

#### **B. The Exemption Will Not Endanger Life or Property or the Common Defense and Security**

This exemption would allow Constellation to load four MPC-68M-CBS in the HI-STORM 100 Cask System beginning June 2024 at the QCNPS ISFSI in a storage condition where the terms, conditions, and specifications in the CoC No. 1014,

Amendment No. 8, Revision No. 1, are not met. In support of its exemption request, Constellation asserts that issuance of the exemption would not endanger life or property because the administrative controls the applicant has in place prevent a tip-over or handling event and that the containment boundary would be maintained in such an event. Constellation relies, in part, on the approach in the NRC's Safety Determination Memorandum (ML24018A085). The NRC issued this Safety Determination Memorandum to address whether, with respect to the enforcement action against Holtec regarding this violation, there was any need to take an immediate action for the cask systems that were already loaded with non-compliant basket designs. The Safety Determination Memorandum documents a risk-informed approach concluding that, during the design basis event of a non-mechanistic tip-over, the fuel in the basket in the MPC-68M-CBS remains in a subcritical condition.

Constellation also provided site-specific technical information, including information explaining why the use of the approach in the NRC's Safety Determination Memorandum is appropriate for determining the safe use of the CBS variant baskets at the QCNPS ISFSI. Specifically, Constellation described that the analysis of the tip-over design basis event that is relied upon in the NRC's Safety Determination Memorandum, which demonstrates that the MPC confinement barrier is maintained, is documented in the updated final safety analysis report (UFSAR) for the HI-STORM 100 Cask System CoC No. 1014, Amendment 8, Revision No. 1, that is used at the QCNPS site. Constellation also described its administrative controls for handling of the HI-STORM 100 Cask System at the QCNPS ISFSI to prevent a tip-over or handling event. Those controls include operational procedures that demonstrate that the system is handled with a single failure proof device, designed in accordance with ANSI N14.6, "Radioactive Materials – Special Lifting Devices for Shipping Containers Weighing 10 000 Pounds (4500 kg) or More," for heavy load lifting component, inside of the Reactor Buildings and during transport to the ISFSI. In addition, the transporter employs redundant drop features.

Additionally, Constellation provided specific information from QCNPS's 72.212 Evaluation Report, Revision 17, indicating that during the design basis event of a non-mechanistic tip-over, QCNPS's ISFSI would meet the requirements in 10 CFR 72.104, "Criteria for radioactive materials in effluents and direct radiation from an ISFSI or MRS," and 72.106, "Controlled area of an ISFSI or MRS." Specifically, Constellation described that, in the highly unlikely event of a tip-over, any potential fuel damage from a non-mechanistic tip-over event would be localized, the confinement barrier would be maintained, and the shielding material would remain intact. Coupled with the distance of the QCNPS ISFSI to the site area boundary, Constellation concluded that compliance with 72.104 and 72.106 is not impacted by approving this exemption request.

The NRC staff reviewed the information provided by Constellation and concludes that issuance of the exemption would not endanger life or property because the administrative controls that Constellation has in place at the QCNPS ISFSI sufficiently minimize the possibility of a tip-over or handling event, and that the containment boundary would be maintained in such an event. The staff confirmed that these administrative controls comply with the technical specifications and UFSAR for the HI-STORM 100 Cask System CoC No. 1014, Amendment 8, Revision No. 1, that is used at the QCNPS site. In addition, the staff confirmed that the information provided by Constellation regarding the QCNPS's 72.212 Evaluation Report, Revision 17, demonstrates that the consequences of normal and accident conditions would be within the regulatory limits of the 10 CFR 72.104 and 10 CFR 72.106. The staff also determined that the requested exemption is not related to any aspect of the physical security or defense of the QCNPS ISFSI; therefore, granting the exemption would not result in any potential impacts to common defense and security.

For these reasons, the NRC staff has determined that under the requested exemption, the storage system will continue to meet the safety requirements of 10 CFR part 72 and the offsite dose limits of 10 CFR part 20 and, therefore, will not endanger life or property or the common defense and security.

### **C. The Exemption is Otherwise in the Public Interest**

The proposed exemption would allow Constellation to load four MPC-68M-CBS in the HI-STORM 100 Cask System beginning in June 2024 at the QCNPS ISFSI, even though the CBS variant basket design is not part of the approved CoC No. 1014, Amendment No. 8, Revision No. 1. According to Constellation, the exemption is in the public interest because the inability to load fuel into dry storage in the future loading campaign would impact Constellation's ability to offload fuel from the QCNPS reactor units, consequently impacting continued safe reactor operation.

Constellation stated that delaying the future loading campaign would impact its ability to effectively manage the margin to full core discharge capacity in the QCNPS Unit 1 and Unit 2 spent fuel pools. The low spent fuel pool capacity would make it difficult to refuel and present potential risks to fuel handling operations during pre- and post-outage. In addition, a crowded spent fuel pool would challenge the decay heat removal demand of the pool and, therefore, increase the consequence of a loss of fuel pool cooling event. The additional fuel moves that would be required to manage the fuel pool loading with extra bundles in the pool would also increase the likelihood of a fuel handling accident. Furthermore, QCNPS planned the cask loading campaign years in advance based on availability of the specialized workforce and equipment that is shared throughout the Constellation fleet. These specialty resources support competing priorities including refueling outages, loading campaigns, fuel pool cleanouts, fuel inspections, fuel handling equipment upgrade and maintenance, fuel sipping, new fuel receipt, and crane maintenance and upgrades. Any delays would have a cascading impact on other scheduled specialized activities.

For the reasons described by Constellation in the exemption request, the NRC agrees that it is in the public interest to grant the exemption. If the exemption is not granted, to comply with the CoC, Constellation would have to delay future loading and keep the spent nuclear fuel in the spent fuel pool. As described by Constellation, this scenario would affect Constellation's ability to effectively manage the spent pool capacity

and reactor fuel offloading at QCNPS. In addition, a crowded spent fuel pool would challenge the decay heat removal demand of the pool increasing the consequence of a loss of fuel pool cooling event; and, because additional fuel moves would be required, it would also increase the likelihood of a fuel handling accident. Moreover, the rescheduling of the specialized resources for the future loading campaign would impact the operations of QCNPS and other Constellation sites.

Therefore, the staff concludes that approving the exemption is in the public interest.

#### Environmental Consideration

The NRC staff also considered whether there would be any significant environmental impacts associated with the exemption. For this proposed action, the NRC staff performed an environmental assessment pursuant to 10 CFR 51.30. The environmental assessment concluded that the proposed action would not significantly impact the quality of the human environment. The NRC staff concluded that the proposed action would not result in any changes in the types or amounts of any radiological or non-radiological effluents that may be released offsite, and there would be no significant increase in occupational or public radiation exposure because of the proposed action. The environmental assessment and the finding of no significant impact was published on April 30, 2024 (89 FR 34282).

#### **IV. Conclusion**

Based on these considerations, the NRC has determined that, pursuant to 10 CFR 72.7, the exemption is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest. Therefore, the NRC grants Constellation an exemption from the requirements of §§ 72.212(a)(2), 72.212(b)(3), 72.212(b)(5)(i), 72.212(b)(11), and 72.214 with respect to the future loading in the HI-STORM 100 Cask System of four MPC-68M-CBS beginning in June 2024.

This exemption is effective upon issuance.

Dated: April 30, 2024.

For the Nuclear Regulatory Commission.

**/RA/**

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