

January 22, 2025

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Nine Mile Point Nuclear Station, Units 1 and 2
Renewed Facility Operating Licensee Nos. DPR-63 and NPF-69
NRC Docket Nos. 50-220, 50-410, and 72-1036

Subject: Request for Exemption from Certain Requirements of 10 CFR 72.212 and 10 CFR 72.214 For Nine Mile Point Nuclear Station – Holtec HI-STORM FW and HI-TRAC VW.

The Holtec International Inc., (Holtec) HI-STORM FW dry cask storage system is designed to hold, and store spent fuel assemblies for Independent Spent Fuel Storage Installation (ISFSI) deployment. The system is listed in 10 CFR 72.214 as Certificate of Compliance Number (CoC) 72-1032. This system is authorized for use by Constellation Energy Generation, LLC at Nine Mile Point Nuclear Power Station (NMP) in accordance with 10 CFR 72.210, “General license issued.”

Pursuant to 10 CFR 72.7, “Specific Exemptions,” Constellation Energy Generation, LLC (CEG) requests an exemption from the requirements of 10 CFR 72.212(a)(2), 10 CFR 72.212(b)(3), 10 CFR 72.212(b)(5)(i), 10 CFR 72.212(b)(11), and 10 CFR 72.214 for the NMP ISFSI. Specifically, an exemption is requested for the Holtec multi-purpose canisters (MPC-89) during Loading and Transport Operations using the HI-TRAC VW transfer cask (HI-TRAC) requiring analysis of a postulated tornado missile event using NRC approved methods of evaluation.

This exemption is needed because the HI-TRAC, which is used during Loading and Transport Operations of the MPC-89, does not comply with the requirements of the NMP 72.212 evaluation report or CoC 72-1032. The NMP site-specific analysis performed to demonstrate protection of the loaded MPC-89, while in the HI TRAC, against tornado-borne missiles was not performed consistent with the NRC approved method of evaluation. Specifically, the site-specific analysis credits protection provided from the HI-TRAC water jacket shell. The NRC approved methodology, as described in the Holtec FSAR, specifically states that no credit is given for the water jacket shell.

The requested exemption will allow use of the HI-TRAC at NMP during the upcoming campaign scheduled to begin in May of 2025.

Nine Mile Point Nuclear Station
10 CFR Part 72 Exemption Request
January 22, 2025
Page 2 of 2

As such, CEG requests approval of this exemption request by April 24, 2025, to support the campaign activities scheduled to begin on May 24, 2025.

The attachment to this letter provides the justification and rationale for the exemption request.

There are no regulatory commitments contained in this submittal.

If you have any questions or require additional information, please contact Christian Williams at (267) 533-5724.

Respectfully,

Knowles,
Justin W

Digitally signed by
Knowles, Justin W
Date: 2025.01.22
13:50:01 -05'00'

Justin Knowles
Sr. Manager - Licensing
Constellation Energy Generation, LLC

Attachment: Constellation Request for Specific Exemption from Certain Requirements of 10 CFR 72.212 and 10 CFR 72.214 for Nine Mile Point Nuclear Station

cc: w/ Attachments
Regional Administrator - NRC Region I
Resident/Senior Resident Inspector – Nine Mile Point Nuclear Station
NRC Project Manager – Nine Mile Point Nuclear Station
A.L. Peterson, NYSERDA
A. Kauk, NYSPSC
B. Frymire, NYSPSC

Attachment

**CONSTELLATION REQUEST FOR SPECIFIC EXEMPTION FROM
CERTAIN REQUIREMENTS OF 10 CFR 72.212 and 10 CFR 72.214
FOR NINE MILE POINT NUCLEAR STATION**

**CONSTELLATION REQUEST FOR SPECIFIC EXEMPTION FROM
CERTAIN REQUIREMENTS OF 10 CFR 72.212 and 10 CFR 72.214
FOR NINE MILE POINT NUCLEAR STATION**

I. Description

The Holtec International Inc., (Holtec) HI-STORM FW cask storage system is designed to hold, and store spent fuel assemblies for Independent Spent Fuel Storage Installation (ISFSI) deployment. The system is listed in 10 CFR 72.214 as Certificate of Compliance (CoC) Number 72-1032 (Reference 1). This system is authorized for use by Constellation Energy Generation, LLC (CEG) at Nine Mile Point Nuclear Station (NMP) in accordance with 10 CFR 72.210, "General license issued."

Pursuant to 10 CFR 72.7, "Specific Exemptions," CEG requests an exemption from the requirements of 10 CFR 72.212(a)(2), 10 CFR 72.212(b)(3), 10 CFR 72.212(b)(5)(i), 10 CFR 72.212(b)(11), and 10 CFR 72.214 for the NMP ISFSI. Specifically, an exemption is requested for the Holtec Multi-Purpose Canisters (MPC-89) during Loading and Transport Operations using the HI-TRAC VW transfer cask (HI-TRAC) requiring analysis of a postulated tornado missile event using NRC approved methods of evaluation (MOE).

This exemption is needed because the HI-TRAC, which is used during Loading and Transport Operations of the MPC-89, does not comply with the requirements of the NMP 72.212 evaluation report or CoC 72-1032. The NMP site-specific analysis performed to demonstrate protection of the loaded MPC-89, while in the HI-TRAC, against tornado-borne missiles was not performed consistent with the NRC approved method of evaluation. Specifically, the site-specific analysis credits protection provided from the HI-TRAC water jacket shell. The NRC approved methodology, as described in the Holtec FSAR, specifically states that no credit is given for the water jacket shell.

The technical justification supporting the use of the HI-TRAC is provided in the following sections.

II. Background

NMP currently utilizes the HI-STORM FW System under CoC No. 72-1032, Amendment No. 3 Revision 0, for dry storage of spent nuclear fuel in specific Multi-Purpose Canisters (MPC) (i.e., MPC-89 canisters). All design features and contents must meet the HI-STORM FW CoC, operations must occur within the Limiting Conditions for Operations (LCOs), and the site must demonstrate that design requirements are satisfied under applicable site-specific parameters that are not bounded by generic analysis.

Section 1.2.1.3 of the HI-STORM FW FSAR (Reference 2) requires that the HI-TRAC provide protection of the MPC-89 against extreme environmental phenomena loads, such as tornado-borne missiles, during short-term operations. Section 3.4.4.1.3.b of Reference 2 provides the detailed analysis of a generic set of small and intermediate missiles on the HI-TRAC. A description of the methodology is provided in Reference 2 including the assumption that no credit is taken for resistance provided by the water jacket shell of the HI-TRAC. This assumption is conservative, as the water jacket shell is physically present and does provide resistance to any potential tornado missile. For stations that have design basis missiles that are not bounded by the generic analysis, a station-specific analysis is required following the methodology used for the generic analysis.

Holtec analyzed site-specific missiles for all sites using the HI-STORM FW system, including NMP, in a single document, HI-2135869, titled "Site-Specific Tornado Missile Analysis For HI-STORM FW System". Revision 10 of this document (Reference 3) was incorporated at NMP as discussed below. On January 17, 2025, Holtec submitted the most recent revision of this document to the

**CONSTELLATION REQUEST FOR SPECIFIC EXEMPTION FROM
CERTAIN REQUIREMENTS OF 10 CFR 72.212 and 10 CFR 72.214
FOR NINE MILE POINT NUCLEAR STATION**

NRC Document Management System under ML25021A246 (Reference 4)

The NMP design basis missiles are not fully bounded by the missiles referenced in Section 2.2.3.e of Reference 2. Specifically, the NMP design basis tornado missiles include a 4" X 12" X 12' wooden plank weighing 200 pounds and traveling with a horizontal velocity of 288 miles per hour (mph). This missile, as well as all NMP site specific missiles, are identified and evaluated in Reference 3. Accordingly, NMP incorporated the results of HI-2135969 Revision 10 into the NMP 72.212 evaluation report (Reference 5) as HI-2200893, "Evaluation of Plant Hazards at Nine Mile Point Power Plant" (Reference 6). Tornado Missile Hazards are addressed in Section 4.3 of Reference 5 which establishes HI-2200893 Revision 6, and subsequently HI-2135869 Revision 10, as the basis for meeting the FSAR requirement.

The analysis performed in Reference 3 follows the methodology of the generic analysis of Reference 2 with one exception. Contrary to the assumption stated above, Reference 3 takes credit for protection provided by the water jacket shell.

Holtec has determined that crediting the water jacket shell constitutes a change to the NRC approved methodology and therefore NRC approval is required prior to use. On December 12, 2024, Holtec submitted proposed Change 5 to the HI-STORM FW CoC Amendment Request 10 to allow crediting the water jacket shell as part of the generic analysis methodology. Once approved, the station-specific analysis captured in Reference 3 will be in compliance with Reference 2.

As such, the current station specific analysis of the NMP design basis missile, for the HI-TRAC, does not comply with an NRC approved methodology. Further, Holtec determined that when the NRC approved methodology is followed, and the water jacket shell is not credited, the 12' wooden plank described above will not pass the Reference 2 acceptance criteria.

This exemption request is necessary to allow NMP to conduct Loading and Transport Operations using the HI-TRAC prior to NRC approval of HI-STORM FW CoC Amendment 10.

This exemption request is applicable to Loading and Transport Operations only, including when the loaded HI-TRAC is located on the refuel floor and outdoors for transport, stack-up, etc. Once the MPC-89 is downloaded into the HI-STORM FW at the NMP ISFSI Cask Transfer Facility, the loaded MPC-89 will be in compliance with the Holtec FSAR.

The technical justification supporting use of the HI-TRAC is provided in the following.

III. Basis for Approval of Exemption Request

In accordance with 10 CFR 72.7, the NRC may, upon application by an interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

a) Authorized by Law

This exemption would allow NMP to load and transport the MPC-89 design canisters during a future loading campaign. The NRC issued 10 CFR 72.7 under the authority granted to it under Section 133 of the Nuclear Waste Policy Act of 1982, as amended, 42 U.S.C. § 10153. Section 72.7 allows the NRC to grant exemptions from the requirements of 10 CFR

**CONSTELLATION REQUEST FOR SPECIFIC EXEMPTION FROM
CERTAIN REQUIREMENTS OF 10 CFR 72.212 and 10 CFR 72.214
FOR NINE MILE POINT NUCLEAR STATION**

Part 72. Therefore, the exemption is authorized by law.

b) Will not Endanger Life or Property or the Common Defense and Security

As demonstrated in Reference 3, the evaluation of NMPs postulated tornado missiles demonstrates that all FSAR acceptance criteria are met. This analysis follows the same mathematical approach as the generic FSAR but takes credit for the additional resistance provided by the water jacket shell. The water jacket shell, classified as an Important to Safety (ITS) component, is required by the HI-TRAC licensing drawings, and meets all the criteria as analyzed. Therefore, the HI-TRAC provides the adequate protection against the NMP design basis tornado-borne missiles. As such, the proposed exemption does not endanger life or property or the common defense and security.

c) Otherwise in the Public Interest

It is in the public's interest to grant this exemption, since dry storage places the fuel in an inherently safe, passive system, and the exemption would permit NMP to execute scheduled loading campaigns to move spent fuel from the NMP Fuel Pools to dry storage before full compliance. This exemption would maintain the ability to offload fuel from the reactor, thus allowing continued safe reactor operation.

The following NMP-specific information is being provided to demonstrate that this exemption is otherwise in the public interest.

i. Maintain Full Core Discharge Capabilities:

The most significant impact of not being able to use the HI-STORM FW system in upcoming campaigns relates to the ability to effectively manage the margin to full core discharge capability (FCDC) in the NMP Unit 1 and Unit 2 Spent Fuel Pools (SFP).

The following margin discussion is based on anticipated loading schedules, which are not controlled documents, and should be considered estimates or targets.

Following the N1R28 Refueling Outage (RFO) in March of 2025, Unit 1 will have an FCDC margin of 243 open cells with 775 total open cells in the SFP. The number of open cells provide discharge capability through the end of license year 2029.

Unit 2 has an FCDC margin of 222 open cells with 986 total open cells in the SFP. Loading 6 HOLTEC MPC-89s from the Unit 2 SFP in the 2025 Spent Fuel Loading Campaign (SFLC) will increase this margin to 756 open cells with 1520 total open cells.

If NMP removes the 6 Holtec MPC-89s from the 2025 SFLC scope, the Unit 2 FCDC margin will remain at 222 open cells. Since NMP Unit 2 does not have a SFLC scheduled in 2026, the FCDC margin will remain at 222 open cells until the 2026 refueling outage. The 2026 refueling outage (N2R20) will decrease the FCDC margin

**CONSTELLATION REQUEST FOR SPECIFIC EXEMPTION FROM
CERTAIN REQUIREMENTS OF 10 CFR 72.212 and 10 CFR 72.214
FOR NINE MILE POINT NUCLEAR STATION**

to -74 (loss of FCDC) due to a planned discharge of 296 fuel bundles from the Unit 2 SFP.

Having an FCDC margin of only 222 open cells for over a year of NMP operation and the loss of FCDC in 2026 present unnecessary risks and challenges to SFP inventory and operations.

Having low margins to FCDC makes it difficult to stage the complete reload batch of fuel in the SFP in preparation for outages. This presents a potential reactivity management risk to fuel handling operations during pre and post-outage activities.

ii. *Decay Heat Removal Requirements:*

Each spent fuel bundle contributes to the decay heat removal demand on the spent fuel pool cooling systems. The estimated decay heat from the spent fuel that is scheduled to be moved to dry storage is 1 to 2% per cask. Additionally, removing spent fuel bundles from the fuel pool allows for dispersion of the remaining heat load.

iii. *Accident Consequences and Probability:*

Design Bases Accidents associated with the fuel pool include a loss of fuel pool cooling event and a fuel handling accident (FHA). The consequence of a loss of fuel pool cooling is made worse due to the 1 to 2% additional decay heat load contributing to increasing fuel pool temperatures as well as the additional spent fuel experiencing the loss of cooling. The consequence of an FHA is not impacted however the likelihood of an FHA is increased based on additional fuel moves required to manage fuel pool loading with unnecessary bundles in the pool.

iv. *Margin to Capacity:*

Once SFP capacity is reached, the ability to refuel to the operating reactor is limited thus taking away a highly reliable clean energy source.

v. *Logistical Considerations and Cascading Impact:*

Cask loading campaigns are budgeted, planned, and scheduled years in advance of the actual performance. Campaigns are scheduled based on the availability of the specialized work force and equipment that is shared throughout the CEG fleet. These specialty resources support multiple competing priorities including RFOs, loading campaigns, fuel pool cleanouts, fuel inspections, fuel handling equipment upgrades and maintenance, fuel sipping, new fuel receipt, and crane maintenance and upgrades. Each of these activities limit the available windows to complete cask loading campaigns and delays in any one of these activities has an obvious cascading impact on all other scheduled specialized activities.

vi. *Conclusion:*

Maintaining adequate FCDC margin ensures operational flexibility necessary for

**CONSTELLATION REQUEST FOR SPECIFIC EXEMPTION FROM
CERTAIN REQUIREMENTS OF 10 CFR 72.212 and 10 CFR 72.214
FOR NINE MILE POINT NUCLEAR STATION**

sustained safe and efficient operation of the operating nuclear facility.

Additionally, based on the logistic and financial impact on CEG as discussed above with no corresponding increase in safety as demonstrated in Reference 3, delaying the upcoming NMP loading campaign provides no measurable public benefit.

In contrast, approval of the referenced exemption request supports the continued safe, efficient, and cost-effective operation of NMP and is therefore in the public's interest.

IV. Technical Justification

The HI-TRAC is designed and fabricated in accordance with the licensing drawings in Section 1.5 of Reference 2. This design includes multiple steel shells with lead and water between the shells. The HI-TRAC is required for shielding and protection of the spent nuclear fuel during loading and closure of the MPC-89 and during movement of the loaded MPC-89 from the cask loading area of the SFP to the storage overpack. The HI-TRAC has the following performance objectives:

1. Provide shielding to plant personnel engaged in conducting short-term operations
2. Provide protection of the MPC-89 against extreme environmental phenomena loads, such as tornado-borne missiles, during short-term operations
3. Serve as the container equipped with appropriate lifting appurtenances to lift, move, and handle the MPC-89 during short-term operations
4. Provide the means to restrain the MPC-89 from sliding beyond the shielding envelope of the transfer cask under a postulated handling accident
5. Facilitate the transfer of a loaded MPC-89 to or from the HI-STORM FW overpack

This exemption request does not change the physical design or construction of the HI-STORM FW overpack, HI-TRAC, or MPC-89, nor does it change the process for lifting and handling of the system. The impacted performance criterion is item #2 above.

Structural and Confinement

The acceptance criteria, as described in the Reference 2, for the postulated tornado missile impact on the HI-TRAC from small or intermediate missiles are:

- a. Tornado generated missiles do not compromise the integrity of the MPC-89 Confinement Boundary while the MPC-89 is contained within HI-TRAC.
- b. No geometry changes occur under any postulated handling or storage conditions that may preclude ready retrievability of the contained MPC-89.
- c. The cask does not globally deform plastically such that the shielding effectiveness of the cask is significantly affected.

As discussed above, the FSAR describes the methodology for tornado missile evaluations using classical energy balance to compute the depth of penetration. When the FSAR methodology is applied to the site-specific missiles at NMP, the conservative evaluation method, which includes the assumption to not credit the water jacket shell, gives results that show the above acceptance criteria may not be met for one high velocity missile. That missile is a 4" x 12" x 12-foot-long wood plank, which has an impact velocity of 288 mph at NMP. For context, the tornado missiles evaluated in Chapter 3 of the HI-STORM FW FSAR have impact velocities of 126 mph (see FSAR

**CONSTELLATION REQUEST FOR SPECIFIC EXEMPTION FROM
CERTAIN REQUIREMENTS OF 10 CFR 72.212 and 10 CFR 72.214
FOR NINE MILE POINT NUCLEAR STATION**

Table 2.2.5). Hence, the conservative method of evaluation provided in the FSAR was developed for a significantly lower impact energy than the wood plank missiles at NMP.

The same site-specific wood plank missiles were analyzed using the same classical energy balance approach with credit given for the resistance from the water jacket shell in Design Analysis HI-2135869 (Reference 3). All other assumptions relating to the missile behavior and kinetic energy depletion remain the same. The evaluated components of the HI-TRAC are classified as Important to Safety (ITS) components, so including them in the tornado missile evaluation is appropriate. The results of this evaluation show that the inner shell is not penetrated and absorbs the remaining kinetic energy of the wooden plank, therefore there is no impact to the MPC-89 Confinement Boundary and no deformation of the HI-TRAC that would prevent the MPC-89 from being retrieved or significantly affect shielding effectiveness.

Shielding and Criticality

As stated in Section 12.2.6.2 of Reference 2, the shielding evaluation is already performed for a complete loss of water from the water jacket. The structural damage to the HI-TRAC shielding from the tornado missile is still bounded by the existing accident analysis, and therefore there is no change to the shielding conclusions.

Section 12.2.6.2 of Reference 2 indicates that there is no effect on the criticality control features of the system as a result of the tornado missile event. As stated above, with credit taken for the water jacket shell, the system continues to meet acceptance criteria, and thus there is no change to this conclusion.

Thermal

As stated in Section 12.2.6.2, the thermal analysis has already considered the consequence of the complete loss of water due to the rupture of the water jacket shell. The revised structural analysis demonstrates that the FSAR acceptance criteria continue to be met, and thus the complete loss of water continues to be bounding.

Materials

There is no change in the materials used in the HI-TRAC. Therefore, there is no new material related safety concern.

Safety Conclusion

The above analysis demonstrates that the revised tornado missile methodology using the actual components of the HI-TRAC meets all FSAR acceptance criteria for site specific missiles at NMP.

V. Environmental Consideration

The proposed exemption does not meet the eligibility criterion for categorical exclusion for performing an environmental assessment as set forth in 10 CFR 51.22(c)(25) because the exemption does not satisfy the requirement of 10 CFR 51.22(c)(25)(vi).

NMP has evaluated the environmental impacts of the proposed exemption request and has determined that neither the proposed action nor the alternative to the proposed action will have an

**CONSTELLATION REQUEST FOR SPECIFIC EXEMPTION FROM
CERTAIN REQUIREMENTS OF 10 CFR 72.212 and 10 CFR 72.214
FOR NINE MILE POINT NUCLEAR STATION**

adverse impact on the environment. Therefore, neither the proposed action nor the alternative requires any Federal permits, licenses, approvals, or other entitlements.

a) Environmental Impacts of the Proposed Action

The NMP ISFSI is a radiologically controlled area on the plant site. The area considered for potential environmental impact because of this exemption request is the area in and surrounding the ISFSI.

The interaction of a loaded HI-STORM FW system, including the HI-TRAC, with the environment is through thermal, shielding, and confinement design functions for the cask system. As stated above, there is no change to any of the conclusions in those areas, and therefore no impact on the environment.

There are no gaseous, liquid, or solid effluents (radiological or non-radiological), radiological exposures (worker or member of the public) or land disturbances associated with the proposed exemption. Therefore, approval of the requested exemption has no impact on the environment.

b) Adverse Environmental Effects Which Cannot be Avoided Should the Exemption be Approved

Since there are no environmental impacts associated with approval of this exemption, there are no adverse environmental effects which cannot be avoided should the exemption request be approved.

c) Alternative to the Proposed Action

In addition to the proposed exemption request, alternative action has been considered. Specifically, future loading campaigns would need to be delayed until the HI-STORM FW Amendment 10 has been approved.

d) Environmental Effects of the Alternatives to the Proposed Action

There are no environmental impacts associated with the alternative to the proposed action.

e) Environmental Conclusion

As a result of the environmental assessment, Loading and Transport Operations of the MPC-89 at NMP, using the HI-TRAC, is in the public interest in that it ensures timely transition of spent fuel to the preferred dry storage facilities and maximizes operational flexibility.

VI. Conclusion

As the safety assessment and environmental review above demonstrate, the HI-STORM FW system with the MPC-89 canister in the HI-TRAC is capable of performing required safety functions and is capable of mitigating the effects of design basis accidents. Therefore, use of a modified method of evaluation for the HI-TRAC tornado missile evaluation does not present a threat to public and environmental safety.

CEG has reviewed the requirements in 10 CFR 72 and determined that an exemption to certain

**CONSTELLATION REQUEST FOR SPECIFIC EXEMPTION FROM
CERTAIN REQUIREMENTS OF 10 CFR 72.212 and 10 CFR 72.214
FOR NINE MILE POINT NUCLEAR STATION**

requirements in 72.212 and 72.214 are necessary. This exemption request would allow future loading of the Holtec HI-STORM FW using the HI-TRAC for the term specified in the CoC. The exemption provided herein meets the requirements of 10 CFR 72.7.

References

- 1 HI-STORM FW Certificate of Compliance 72-1032 Amendment No. 6, Revision 0
- 2 HI-STORM FW Final Safety Analysis Report HI-2114830, Revision 6
- 3 Holtec Report HI-2135869, "Site-Specific Tornado Missile Analysis for HI-STORM FW System" Revision 10
- 4 Holtec Report HI-2135869, "Site-Specific Tornado Missile Analysis for HI-STORM FW System" Revision 19 (ML25021A246)
- 5 Nine Mile Point Nuclear Station 10 CFR 72.212 Evaluation Report for the HI-STORM FW System Revision 1, April 2023
- 6 Holtec Report HI-2200893, "Evaluation of Plant Hazards at Nine Mile Point Power Plant" Revision 6