



[7590-01-P]

NUCLEAR REGULATORY COMMISSION

10 CFR Part 72

[NRC-2015-0067]

RIN 3150-AJ58

List of Approved Spent Fuel Storage Casks:

Holtec International HI-STORM UMAX Canister Storage System, Certificate of Compliance No. 1040, Amendment No. 1

AGENCY: Nuclear Regulatory Commission.

ACTION: Direct final rule; confirmation of effective date.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is confirming the effective date of September 8, 2015, for the direct final rule that was published in the *Federal Register* on June 23, 2015. This direct final rule amended the NRC's spent fuel storage regulations by revising the Holtec International, Inc. (Holtec), HI-STORM (Holtec International Storage Module) Underground Maximum Capacity (UMAX) Canister Storage System listing within the "List of approved spent fuel storage casks" to add Amendment No. 1 to Certificate of Compliance (CoC) No. 1040. Amendment No. 1 provides a seismically enhanced version of the HI-STORM UMAX Canister Storage System, identified as the "Most Severe Earthquake (MSE)" version that could be used in areas with higher seismic demands than those analyzed previously. Amendment No. 1 also includes minor physical design changes to help ensure structural integrity of the

amended system. These are the addition of a hold-down system to the closure lid; replacing the fill material in the interstitial spaces between the cavity enclosure containers (CECs) surrounding the casks with 3000 psi concrete; strengthening the multi-purpose canister (MPC) guides, and engineering the guides' nominal gap with the MPC to be tighter than the original HI-STORM UMAX Canister Storage System design.

DATES: *Effective date:* The effective date of September 8, 2015, for the direct final rule published June 23, 2015 (80 FR 35829), is confirmed.

ADDRESSES: Please refer to Docket ID NRC-2015-0067 when contacting the NRC about the availability of information for this action. You may obtain publicly-available information related to this action by any of the following methods:

- **Federal Rulemaking Web site:** Go to <http://www.regulations.gov> and search for Docket ID NRC-2015-0067. Address questions about NRC dockets to Carol Gallagher; telephone: 301-415-3463; e-mail: Carol.Gallagher@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 <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "ADAMS Public Documents" and then 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, 301-415-4737, or by e-mail to pdr.resource@nrc.gov.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O-1F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

FOR FURTHER INFORMATION CONTACT: Solomon Sahle, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-3781; e-mail: Solomon.Sahle@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Discussion

On June 23, 2015 (80 FR 35829), the NRC published a direct final rule amending its regulations in § 72.214 of Title 10 of the *Code of Federal Regulations* (10 CFR) by revising the Holtec HI-STORM UMAX Canister Storage System listing within the “List of approved spent fuel storage casks” to add Amendment No. 1 to CoC No. 1040. Amendment No. 1 provides a seismically enhanced version of the HI-STORM UMAX Canister Storage System, identified as the “Most Severe Earthquake (MSE)” version that could be used in areas with higher seismic demands than those analyzed previously. Amendment No. 1 also includes minor physical design changes to help ensure structural integrity of the amended system. These are the addition of a hold-down system to the closure lid; replacing the fill material in the interstitial spaces between the CECs surrounding the casks with 3000 psi concrete; strengthening the MPC guides, and engineering the guides’ nominal gap with the MPC to be tighter than the original HI-STORM UMAX Canister Storage System design.

II. Public Comments on the Companion Proposed Rule

In the direct final rule, the NRC stated that if no significant adverse comments were received, the direct final rule would become effective on September 8, 2015. The NRC received 10 comment submittals on the companion proposed rule (80 FR 35872). Electronic copies of these comments can be obtained from the Federal Rulemaking Web site,

<http://www.regulations.gov>, by searching for Docket ID NRC-2015-0067. The comments are also available in ADAMS under Accession Nos. ML15210A145, ML15210A150, ML15210A151, ML15210A155, ML15210A169, ML15210A164, ML15210A166, ML15210A177, ML15210A181, and ML15210A184. For the reasons discussed in more detail in Section III, “Public Comment Analysis,” of this document, none of the comments received are considered significant adverse comments as defined in NUREG/BR-0053, Revision 6, “United States Nuclear Regulatory Commission Regulations Handbook” (ADAMS Accession No. ML052720461).

III. Public Comment Analysis

The NRC received 10 comment submittals on the proposed rule, many raising multiple and overlapping issues. As explained in the June 23, 2015, direct final rule (80 FR 35829), the NRC would withdraw the direct final rule only if it received a “significant adverse comment.” This is a comment where the commenter explains why the rule would be inappropriate, including challenges to the rule’s underlying premise or approach, or would be ineffective or unacceptable without a change. A comment is adverse and significant if:

1) The comment opposes the rule and provides a reason sufficient to require a substantive response in a notice-and-comment process. For example, a substantive response is required when:

a) The comment causes the NRC staff to reevaluate (or reconsider) its position or conduct additional analysis;

b) The comment raises an issue serious enough to warrant a substantive response to clarify or complete the record; or

c) The comment raises a relevant issue that was not previously addressed or considered by the NRC staff.

2) The comment proposes a change or an addition to the rule, and it is apparent that the rule would be ineffective or unacceptable without incorporation of the change or addition.

3) The comment causes the NRC staff to make a change (other than editorial) to the rule, CoC, or Technical Specifications (TSs).

The NRC determined that none of the comments submitted on this direct final rule met any of these criteria. The comments either were already addressed by the NRC staff's safety evaluation report (SER) (ADAMS Accession No. ML15070A149), or were beyond the scope of this rulemaking. The NRC has not made any changes to the direct final rule as a result of the public comments. However, the NRC is taking this opportunity to respond to some of the comments in an effort to clarify information about the 10 CFR part 72 CoC rulemaking process.

For rulemakings amending or revising a CoC, the scope of the rulemaking is limited to the specific changes requested by the applicant in the request for the amendment or amendment revision. Therefore, comments about the system or spent fuel storage in general that are not applicable to the changes requested by the applicant are outside the scope of this rulemaking. Comments about details of the particular system that is the subject of the rulemaking, but that are not being addressed by the specific changes requested, have already been resolved in prior rulemakings. Persons who have questions or concerns about prior rulemakings and the resulting final rules may consider the NRC's process for petitions for rulemaking under 10 CFR 2.802. Additionally, safety concerns about any NRC-regulated activity may be reported to the NRC in accordance with the guidance posted on the NRC's Web site at <http://www.nrc.gov/about-nrc/regulatory/allegations/safety-concern.html>. This Web page provides information on how to notify the NRC of emergency or non-emergency issues.

The NRC identified the following issues raised in the comments, and the NRC's responses to these issues follow.

1) Potential Supersonic Shear Earthquakes and Site Specific Seismic Standards

Several commenters raised concerns regarding the ability of this CoC system to withstand seismic events, particularly if the system were to be used at specific sites with known seismic activity, such as San Onofre Nuclear Generating Station (SONGS). These commenters

stated that Holtec casks have not been tested for newly discovered potential Supersonic Shear Earthquakes, which might result in a rupture after Supersonic Shear Earthquake Events. According to the comments, cask venting can be blocked after a tsunami leading to cask failure.

NRC Response

These comments are outside the scope of this rulemaking because they are not specific to the amendment at issue in the rule, but instead raise concerns with the general 10 CFR part 72 requirements and process for certification of the CoC systems. This rule adds Amendment No. 1 to the HI-STORM UMAX Canister Storage System, CoC No. 1040. Applicants submitting CoC's for approval are required to document a design bases for their CoC or amendment CoC, which includes seismic parameters. Under 10 CFR 72.212(b)(6), general licensees (power reactors seeking to use those CoC systems at their specific sites) are required to conduct a review of the CoC's Final Safety Analysis Report (FSAR) and the related NRC SER prior to use of the general license to ensure that the reactor site parameters, including analyses of earthquake intensity, are enveloped by the cask design bases considered in these reports. This rulemaking makes no determination regarding the acceptability of this amended system for use at any specific site. Nor does this rule seek to change the existing generic nature of CoC approvals or the technical qualifications outlined for CoC approval, as currently envisioned in 10 CFR part 72. Commenters with concerns regarding the existing 10 CFR part 72 regulations for technical review and approval of CoC systems could consider filing a petition for rulemaking under 10 CFR 2.802.

2) Wind Effect on Underground Cask Maximum Heat Load

Commenters stated that according to NUREG-2174 "Impact of Variation in Environmental Conditions on the Thermal Performance of Dry Storage Casks" (ADAMS Accession No. ML15054A207), low-speed wind conditions increased the peak cladding temperature on underground systems, and asked whether this was considered in the

development of the heat load limits of the HI-STORM UMAX Canister Storage System.

NRC Response

The comment is outside the scope of this rulemaking because it is not specific to the amendment at issue in the rule. The NRC evaluated and approved the HI-STORM UMAX Canister Storage System heat loads in the initial CoC certification, and this is provided in its SER (ADAMS Accession No. ML15093A510). The Amendment No. 1 application requested no thermal changes that required NRC evaluation.

3) MPC Seismic Evaluation

A commenter stated that the thin stainless steel MPC canisters are subject to pitting and corrosion (particularly from marine environments like chloride-induced stress corrosion cracking). According to the comment, since cracks may initiate during the initial licensing period in these canisters, cracking canisters should be included in the seismic analysis for MPC's stored while in the HI-STORM UMAX Canister Storage System since it would be of more concern in high risk seismic areas as proposed for this UMAX Amendment.

NRC Response

The comment is outside the scope of this rulemaking because it is not specific to the amendment at issue in the rule. The NRC has evaluated the design of the HI-STORM UMAX Canister Storage System and has determined that the design is robust, and contains a number of layers of acceptable confinement systems in compliance with 10 CFR part 72 requirements. Furthermore, the NRC has evaluated the susceptibility to and effects of stress corrosion cracking and other corrosion mechanisms on safety significant systems for spent nuclear fuel (SNF) dry cask storage (DCS) systems during an initial certification period. The NRC staff has determined that the HI-STORM UMAX Canister Storage System, when used within the requirements of the proposed CoC, will safely store SNF and prevent radiation releases and exposure consistent with regulatory requirements, including seismic requirements. This

evaluation is documented in the NRC staff's SERs (ADAMS Accession Nos. ML15070A149 and ML14202A031).

4) Transfer cask

Commenters ask if the transfer casks were approved for storage of an MPC in case of a failed MPC.

NRC Response

To the extent that this comment raises a concern with the availability of a transfer cask, it raises an issue that was addressed in the NRC's evaluation of this amendment and fails to cite any specific information that would alter the NRC's conclusions. In this case, the transfer cask utilized in the HI-STORM UMAX Canister Storage System is described in the HI-STORM Flood/Wind (F/W) Multipurpose Canister (MPC) Storage System FSAR (ADAMS Accession No. ML15177A336). The HI-STORM UMAX transfer cask is authorized to transfer intact MPC's in accordance with the CoC No. 1040 TSs.

5) Failed Canister Remediation

A commenter asked if there is a plan to remediate a failed canister.

NRC Response

The comment is outside the scope of this rulemaking because it is not specific to the amendment at issue in the rule, but instead raises a concern with the general 10 CFR part 72 requirement and process for certification of the CoC systems. Implementing corrective actions in the event of a failed MPC is the responsibility of the general licensee and those corrective actions are not incorporated into CoC No. 1040.

6) MPC Thickness

Commenters questioned the maximum MPC thickness allowed in this amendment, noting that although the FSAR indicated 0.5” as the maximum thickness, Holtec has proposed using a thickness of 0.625 at San Onofre (SONGS). The commenters raised concerns regarding the implications of such a change outside of a license amendment where it could be properly evaluated to determine if the change in limiting parameters will affect seismic, thermal, weight, dimensions and other critical analyses.

NRC Response

The comment is outside the scope of this rulemaking because it is not specific to the amendment at issue in the rule, but instead raises concerns with the general 10 CFR part 72 requirements and process for certification of the CoC systems. The nominal MPC thickness for the canisters certified under CoC No. 1040, Amendment No. 1 is 0.5”. The NRC has no knowledge of a Holtec proposal to increase the thickness of an MPC to 0.625”. If presented with an amendment request to do so, the NRC will evaluate it in accordance with 10 CFR part 72 requirements.

7) Definition of “Long-term”

Commenters requested the NRC require a definition of “long-term” in the FSAR.

NRC Response

The comment is outside the scope of this rulemaking because it is not specific to the amendment at issue in the rule, but instead raises general concerns regarding terminology. The definitions required by the NRC to support the evaluation and approval of CoC No. 1040, Amendment No. 1, are provided in Appendix A of the CoC, Technical Specifications for the HI-STORM UMAX Canister Storage System. “Long-term” is a general descriptive term that is not required to support any regulatory or technical evaluation, and thus is not required to be more formally defined.

8) Definition of Underground

Commenters requested the NRC define the term “underground” as used in this system. The comments raised concerns that a structure that is only partially underground, but covered on the side with an “earthen berm,” could still be considered “underground” for compliance with this CoC.

NRC Response

The comments regarding the need to define the term “underground” as used in the HI-STORM UMAX Canister Storage System are outside the scope of this rulemaking because they are not specific to the amendment at issue in the rule, but instead raise concerns with the general 10 CFR part 72 requirements and process for certification of CoC systems. In this instance, Holtec has provided and analyzed specific structure placement parameters, and the NRC has evaluated these parameters that bound the placement of such a system in the ground. Pursuant to the regulatory requirements in 10 CFR 72.212(b), any general licensee that seeks to use this system must determine that the design and construction of the system, structures, and components are bounded by the conditions of the CoC by analyzing the generic parameters provided and analyzed in the FSAR and SER to ensure that its site specific parameters are enveloped by the cask design bases established in these reports. The NRC is aware of the SONGS proposed configuration submitted to the California Coastal Commission and is closely monitoring this issue. The NRC will continue to ensure that the facility constructed at SONGS meets the requirements of the CoC and TS of the specific DCS system selected by Southern California Edison.

9) Heat Load Charts

One commenter stated that the FSAR indicates that changes to storage cell kW heat loads were made and requested that the NRC determine if this was evaluated in the

amendment request. The comment also requested clarification on the placement configuration of SNF assemblies in the MPC, as well as the rationale for the heat load configuration.

NRC Response

This comment is outside the scope of this rulemaking because it is not specific to the amendment at issue in the rule, but instead raises concerns with the general 10 CFR part 72 requirements and process for certification of CoC systems. The comment is addressing revision bars that are incorporated into the HI-STORM UMAX Canister Storage System FSAR, Revision 2 (ADAMS Accession No. ML14202A031). The tables referenced in the comment were revised due to changes made during the original HI-STORM UMAX Canister Storage System evaluation; 10 CFR 72.248(a)(1) requires that an updated FSAR reflecting any changes made during the NRC review process be submitted within 90 days after an approval of the cask design. The loading patterns were evaluated and approved by the NRC staff in its initial SER (ADAMS Accession No. ML15093A510). The Amendment No. 1 application required no further changes to these tables requiring NRC evaluation.

10) MPC Inspection

A commenter requested that the NRC clarify that the MPC leak test inspection, that is used to verify the integrity of the confinement boundary, is performed before the MPC is loaded with fuel.

NRC Response

This comment is outside the scope of this rulemaking because it is not specific to the amendment at issue in the rule, but instead raises concerns with the general 10 CFR part 72 requirements and process for certification of CoC systems. The HI-STORM F/W MPC Canister System FSAR clearly identifies the purpose of the MPC leak detection requirement as a post fabrication certification test that is only required to be performed one time.

11) Assumption of No Fuel Cladding Degradation after Dry Storage is not Substantiated

Some commenters raised an issue with Holtec's claim that there is no credible mechanism for gross fuel cladding degradation of fuel classified as undamaged during storage in the HI-STORM UMAX Canister Storage System.

NRC Response

These comments are outside the scope of this rulemaking because they are not specific to the amendment at issue in the rule. Instead, these comments raise issues that would be addressed during any renewal application review. The NRC has determined that fuel cladding degradation is not an issue during the initial 20-year certification period, but instead, is an issue that would have to be addressed if a CoC holder requested renewal of the CoC for a period beyond the initial 20 years. If a renewal application is filed, NRC regulations require that the application include programs to manage the effects of aging, including necessary monitoring and inspection programs. Those programs would have to be reviewed and determined acceptable by the NRC before any CoC renewal is approved.

12) Vertical Ventilated Module Needs Substantiation for Expected Lifespan

Commenters questioned Holtec's claims of a design life of 60 years, a service life of 100 years and a licensed life of 40 years. Since no substantiation was provided for these claims, the commenters requested the claims be removed from the FSAR.

NRC Response

This issue is outside of the scope of this rulemaking because the term of a certificate is determined in the original certification, not in amendments to that certification. This rulemaking seeks to add Amendment No. 1 to CoC No. 1040. In this case, the UMAX CoC was approved

on March 6, 2015 (80 FR 12073), for an initial 20-year term. This 20-year term will also apply to Amendment No. 1. Use of this system beyond the expiration date of 20 years would require an evaluation of a renewal application for this CoC which would be addressed in a subsequent rulemaking process.

13) Concrete Inspection and Inspection Limitations

Some commenters questioned whether the HI-STORM UMAX Canister Storage System design provided a safe and accessible method to perform inspections within the license period given that high seismic risk areas are more likely to cause cracking or other structural changes, and indicated that such an evaluation should be part of the NRC's review process.

NRC Response

This comment is outside the scope of this rulemaking because it is not specific to the amendment at issue in the rule, but instead raises concerns with the general 10 CFR part 72 requirements and process for certification of CoC systems. The NRC has determined that concrete degradation is not an issue requiring inspection during the initial 20-year certification period, but instead, is an issue that would have to be addressed if a CoC holder requested renewal of the CoC for a period beyond the initial 20 years. If a renewal application is filed, NRC regulations require that the application include programs to manage the effects of aging, including necessary monitoring and inspection programs. Those programs would have to be reviewed and determined acceptable by the NRC before any CoC renewal is approved.

14) High Burnup Fuel

Commenters also raised questions regarding the long-term acceptability of the extended storage of high burnup fuel (HBF).

NRC Response

To the extent these comments raise issues about the storage of HBF in the CoC for the first 20 years, these comments are outside the scope of this rulemaking. The NRC has evaluated the acceptability of storage of HBF for the initial 20-year certification term for the HI-STORM UMAX Canister Storage System during its review of the initial certificate. As documented in the NRC staff's SER under Docket ID NRC-2014-0120, the NRC staff has determined that the use of the HI-STORM UMAX Canister Storage System, including storage of HBF, will be conducted in compliance with the applicable regulations of 10 CFR part 72, and the CoC should be approved for the initial 20-year term. This amendment does not impact the analysis conducted by the NRC staff during the initial certification of this system.

Additionally, to the extent these comments raise concerns regarding the storage of HBF beyond the initial term of 20 years, the comments are also outside the scope of this rulemaking. A request to store HBF beyond the initial 20 years provided in the certification of this system will require the applicant to submit a license renewal application with the inclusion of Aging Management Programs addressing HBF. In that regard, a demonstration project is being planned by the U.S. Department of Energy to provide confirmatory data on the performance of HBF in DCS. The NRC plans to evaluate the data obtained from the project to confirm the accuracy of current models that are relied upon for authorizing the storage of HBF for extended storage periods beyond the initial 20-year certification term.

The NRC staff has concluded that the comments received on the companion proposed rule for the Holtec HI-STORM UMAX Canister Storage System, CoC No. 1040, Amendment No. 1, are not significant adverse comments as defined in NUREG/BR-0053, Revision 6, "United States Nuclear Regulatory Commission Regulations Handbook." Therefore, this rule will become effective as scheduled.

Dated at Rockville, Maryland, this 1st day of September, 2015.

For the Nuclear Regulatory Commission.

Cindy Bladey, Chief,
Rules, Announcements, and Directives Branch,
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Office of Administration.
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