

September 17, 2015

**To:** California Coastal Commission  
Joseph Street  
**Fr:** Donna Gilmore

**Re:** Holtec HI-STORM UMAX Canister Storage System Amendment 1 (CoC No. 1040)

The Nuclear Regulatory Commission (NRC) approved the Holtec UMAX Amendment 1 Canister System effective September 8, 2015 with many limitations. This was not an approval for use at San Onofre and the UMAX system is only certified for 20 years.

### Summary

- **Not an approval for use at San Onofre.** “This rulemaking makes no determination regarding the acceptability of this amended system for use at any specific site.”
- **Certified for only the initial 20 years.** Any evaluation for conditions that may occur after this [such as cracking, inspection, aging management, fuel cladding failure from high burnup fuel] are outside the scope of this approval. “Long-term” [as referenced in the Holtec Safety Evaluation] 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.
- **Excludes any plan for storing failed (cracking) canisters.** Both San Onofre V.P. Tom Palmisano, and Holtec President, Dr. Kris Singh, state transfer casks can be used to store failed canisters (July 23, 2015 Community Engagement Panel meeting). However the NRC states “The HI-STORM UMAX transfer cask is authorized to transfer **intact** canisters [e.g., not cracking or otherwise failed canisters].” “Implementing corrective actions in the event of a failed MPC [multi-purpose canister] is the responsibility of the general licensee and those corrective actions are not incorporated into CoC [Certificate of Compliance] No. 1040.”
- **Approved only for 0.5” thick canisters – not the 0.625” thickness San Onofre proposes.** “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.”
- **The underground system evaluated is different than the system proposed for San Onofre.** The approval is for an underground system, not the partially underground system proposed for San Onofre. “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 [Final Safety Analysis Report] and SER [Safety Evaluation Report] to ensure that its site specific parameters are enveloped by the cask design bases established in these reports.”

See details on following pages.

## Key Portions of NRC Responses to Public Comments

### 1) Potential Supersonic Shear Earthquakes and Site Specific Seismic Standards

**These comments are outside the scope of this rulemaking** because they are not specific to the amendment at issue in the rule.

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.**

### 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.

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.

The comment is outside the scope of this rulemaking because it is not specific to the amendment at issue in the rule. The NRC staff has determined that the HI-STORM UMAX Canister Storage System, **when used within the requirements of the proposed CoC, [20 years]** 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.

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.

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.

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.

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 HISTORM 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.

The comments regarding the need to define the term “underground” as used in the HISTORM 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.

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.

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.

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.

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.

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).

**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 HISTORM 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.

#### **References**

**Docket ID NRC-2015-0067:** List of Approved Spent Fuel Storage Casks: Holtec International HI-STORM UMAX Canister Storage System, Certificate of Compliance No. 1040, Amendment No. 1 Direct Final Rule, Effective September 8, 2015  
*<https://www.federalregister.gov/articles/2015/09/08/2015-22053/list-of-approved-spent-fuel-storage-casks-holtec-international-hi-storm-umax-canister-storage-system>*

**Federal Register:** List of Approved Spent Fuel Storage Casks: Holtec International HI-STORM UMAX Canister Storage System, Certificate of Compliance No. 1040, Amendment No. 1 Direct Final Rule, Federal Register Vol. 80, No. 173, pp 53691 – 53694, effective September 8, 2015  
*<http://www.gpo.gov/fdsys/pkg/FR-2015-09-08/pdf/2015-22053.pdf>*

**Public Inspection:** 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  
*<https://s3.amazonaws.com/public-inspection.federalregister.gov/2015-22053.pdf>*

## Public Comments

**Scott Atwater**, underground system

<http://pbadupws.nrc.gov/docs/ML1521/ML15210A145.pdf>

**Paul Frey**, Supersonic Sheer Earthquake Motion

<http://pbadupws.nrc.gov/docs/ML1521/ML15210A150.pdf>

**Donna Gilmore**, wind, seismic, transfer cask, failed canister remediation, thickness, long term, underground define, heat load charts, inspection, fuel clad failure after storage, HBF, lifespan, monitoring, concrete

<http://pbadupws.nrc.gov/docs/ML1521/ML15210A177.pdf>

**Rick Mogel**, vents, tsunami, cracking, inspection, transport, failed canister procedure, monitoring <http://pbadupws.nrc.gov/docs/ML1521/ML15210A166.pdf>

**Dorah Shuey**, concrete, seismic, inspection

<http://pbadupws.nrc.gov/docs/ML1521/ML15210A169.pdf>

**Libbe HaLevy**, early failure

<http://pbadupws.nrc.gov/docs/ML1521/ML15210A151.pdf>

**Laura Lynch**, wind effect, seismic evaluation, transfer cask, thickness, long-term, underground, Coastal Commission submittal, heat load, MPC leak test, lifespan, no monitoring required, concrete <http://pbadupws.nrc.gov/docs/ML1521/ML15210A155.pdf>

**demariarita@yahoo.com**, unsafe

<http://pbadupws.nrc.gov/docs/ML1521/ML15210A164.pdf>

**Anonymous**, supersonic sheer earthquakes, need field testing, vent blocking tsunami, Diablo & San Onofre field testing casks, nuclear experimental testing ground for untested casks <http://pbadupws.nrc.gov/docs/ML1521/ML15210A181.pdf>

**Gary Headrick**, support Donna Gilmore comments

<http://pbadupws.nrc.gov/docs/ML1521/ML15210A184.pdf>