CERTIFICATE OF COMPLIANCE FOR SPENT FUEL STORAGE CASKS

The U.S. Nuclear Regulatory Commission is issuing this certificate of compliance pursuant to Title 10 of the *Code of Federal Regulations*, Part 72, "Licensing Requirements for Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste" (10 CFR Part 72). This certificate is issued in accordance with 10 CFR 72.238, certifying that the storage design and contents described below meet the applicable safety standards set forth in 10 CFR Part 72, Subpart L, and on the basis of the Final Safety Analysis Report (FSAR) of the cask design. This certificate is conditional upon fulfilling the requirements of 10 CFR Part 72, as applicable, and the conditions specified below.

Certificate No.	Effective Date (Certificate)	Expiration Date	Docket No.	Amendment No.	Amendment Effective Date	Package Identification No.
1004	1/23/95	1/23/2015	72-1004	19	TBD	USA/72-1004
	Renewed Effective Date	Renewed Expiration Date		Revision No	Revision Effective Date	
	12/11/17	1/23/2055		0	NA	

Issued To: (Name/Address)

TN Americas LLC
7160 Riverwood Drive, Suite 200
Columbia, MD 21046

Safety Analysis Report Title

TN Americas LLC, “Final Safety Analysis Report for the Standardized NUHOMS® Horizontal Modular Storage System for Irradiated Nuclear Fuel”

CONDITIONS

This certificate is conditioned upon fulfilling the requirements of 10 CFR Part 72, as applicable, the attached Appendix A (Inspections, Tests and Evaluations), Appendix B (Technical Specifications), Appendix C (ASME Code Alternatives), and the conditions specified below:

I. TECHNOLOGY

The Standardized NUHOMS® System is certified as described in the final safety analysis report (FSAR) and in the NRC’s safety evaluation report (SER). The Standardized NUHOMS® System is a horizontal, canister-based, dry spent fuel storage system. The Standardized NUHOMS® System is comprised of a dry shielded canister (DSC), a horizontal storage module (HSM), and a transfer cask (TC). The welded metal DSC provides confinement and criticality control for the storage and transfer of spent fuel. The concrete HSM provides radiation shielding while allowing for cooling of the DSC and fuel by natural convection during storage. The TC is used to facilitate the loading of spent fuel into the DSC at the reactor spent fuel handling building, preparation of the DSC for storage operations, and subsequent transfer of the DSC into the HSM (and out of the HSM for eventual transport and disposal offsite or for other purposes). The TC provides the necessary radiation shielding during these operations.

The following DSC models are authorized for use in the Standardized NUHOMS® System: 24P (Standard and Long Cavity), 24PHB (Standard and Long Cavity), 24PTH (24PTH-S, 24PTH-L, 24PTH-S-LC), 32PT (32PT-S100, 32PT-S125, 32PT-L100, 32PT-L125), 32PTH1 (32PTH1-S, 32PTH1-M, 32PTH1-L), 37PTH (37PTH-S, 37PTH-M), 52B, 61BT, 61BTH Type 1; 61BTH Type 2, 61BTH Type 3, 69BTH.

The two digits refer to the number of fuel assemblies stored in the DSC, the character P for pressurized water reactor (PWR) or B for boiling water reactor (BWR) is to designate the type of fuel stored, and T is to designate that the DSC is intended for transportation in a 10 CFR Part 71 approved package. The characters H or HB generally refer to designs qualified for fuel with burnup greater than 45 GWd/MTU, although certain designs, such as the 32PT, are now also qualified for fuel with burnup greater than 45 GWd/MTU.

Variations of the DSC models have -S, -M or -L at the end to indicate the relative length of the DSCs (-S for short, -M for medium, and - L or -LC for long cavity configurations). Information concerning the fuel types, dose rate limits, or other TS applies to all variants if they are not explicitly mentioned in the CoC, ITE, or TS.

The following HSM models are authorized for use: Standardized HSM, HSM-H, and the HSM-H high seismic option, the HSM-HS.

The following TC models are authorized for use in the Standardized NUHOMS® System: Standardized TC, OS197, OS197H, OS197L, OS200. Additional TCs include the OS197FC and the OS197FC-B variants of the OS197, the OS197HFC and the OS197HFC-B variants of the OS197H, and the OS200FC variant of the OS200, as described in the TS.

With the exception of the TC, fuel transfer and auxiliary equipment necessary for ISFSI operations are not included as part of the Standardized NUHOMS® System referenced in this certificate of compliance (CoC). Such site-specific equipment may include, but is not limited to, special lifting devices, the transfer trailer and the skid positioning system.

II. DESIGN FEATURES

II.1 CODES AND STANDARDS

II.1.a Horizontal Storage Module (HSM)

The Standardized HSM and HSM-H reinforced concrete modules are designed to meet the requirements of ACI 349-85 and ACI 349-97 Editions, respectively.

Load combinations specified in ANSI 57.9-1984, Section 6.17.3.1 are used for combining normal operating, off-normal, and accident loads for the HSM.

If an ISFSI site is located in a coastal salt water marine atmosphere, then any load-bearing carbon steel DSC support structure rail components of any associated HSM shall be procured with a minimum of 0.20 percent copper content or stainless steel material shall be used for corrosion resistance. For weld filler material used with carbon steel, 1% or more nickel bearing weld material would also be acceptable in lieu of 0.20% copper content.

II.1.b Dry Shielded Canister (DSC)

The DSCs are designed, fabricated and inspected to the maximum practical extent in accordance with ASME Boiler and Pressure Vessel Code Section III, Division 1, Subsections NB, NF, and NG for Class 1 components and supports. The ASME code edition years and any addenda for the various DSC types are provided in the table below.

ASME code requirements for basket assemblies apply only to important to safety category A components.

DSC Type	Applicable Code	Edition/Year
24P/52B/ 24PHB	ASME B&PV Code, Section III, Division 1, Subsections NB and NF	1983 Edition with Winter 1985 Addenda
61BT	ASME B&PV Code, Section III, Division 1, Subsections NB, NG and NF, including Code Case N-595-1	1998 Edition with 1999 Addenda
32PT, 24PTH*	ASME B&PV Code, Section III, Division 1, Subsections NB, NG and NF, including Code Case N-595-2	1998 Edition with Addenda through 2000
61BTH*, 32PTH1	ASME B&PV Code, Section III, Division 1, Subsections NB, NG and NF	1998 Edition with Addenda through 2000
69BTH, 37PTH	ASME B&PV Code, Section III, Division 1, Subsection NB, NG, and NF	2004 Edition with Addenda through 2006

* ASME B&PV Code, Section III, Division 1, Subsections NG and NF are not applicable to the Type 3 basket assemblies in the 24PTH-S, 24PTH-L, 24PTH-S-LC, and 61BTH DSCs.

II.1.c Transfer Cask (TC)

The TC is designed, to the maximum practical extent in accordance with ASME Boiler and Pressure Vessel Code Section III, Subsection NC for Class 2 vessels.

The ASME Code edition year and any addenda are provided in the table below.

TC	Applicable Code	Edition/Year
OS197/OS197H OS197FC/OS197HFC OS197L/OS197FC-B OS197HFC-B	ASME B&PV Code, Section III, Division 1, Subsection NC	1983 Edition with Winter 1985 Addenda
OS200 OS200FC	ASME B&PV Code, Section III, Division 1, Subsection NC	1998 Edition with Addenda through 2000

For the OS197L TC, the supplementary trailer shield is designed to resist the normal operating dead weight and handling loads in accordance with “Manual of Steel Construction Allowable Stress Design”, 9th Edition, American Institute of Steel Construction, Inc.

For the OS197L TC, the decontamination area shielding is designed to resist the normal operation dead weight, lifting loads, and seismic load in accordance with “Manual of Steel Construction Allowable Stress Design,” 9th Edition, American Institute of Steel Construction, Inc.

II.1.d ASME Code Alternatives

ASME Code alternatives for DSC pressure boundary or confinement boundary components, DSC basket assembly components, and TC components, can be found in CoC Appendix C.

Proposed alternatives to the ASME code, other than the aforementioned ASME Code alternatives may be used when authorized by the Director of the Office of Nuclear Material Safety and Safeguards, or designee. The applicant should demonstrate that:

1. The proposed alternatives would provide an acceptable level of quality and safety, or
2. Compliance with the specified requirements of ASME Code, Section III, Edition year and Addenda would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Requests for exceptions in accordance with this section should be submitted in accordance with 10 CFR 72.4.

II.2 STORAGE LOCATION DESIGN FEATURES

The following storage location design features and parameters shall be verified by the system user to assure technical agreement with the UFSAR.

II.2.a Storage Configuration

HSMs are placed together in single rows or back-to-back arrays. An end shield wall is placed on the outside end of any loaded outside HSM. A rear shield wall is placed on the rear of any single row loaded HSM.

A minimum of two (2) HSM-H modules are required to be placed adjacent to each other for stability during design basis flood loads.

A minimum of three (3) high seismic option HSM-H modules are to be connected with each other.

II.3 TC DESIGN FEATURES

II.3.a The TC is designed and fabricated as a lifting device to meet NUREG-0612 and ANSI N14.6 requirements.

II.3.b The OS197L TC shall only be used with DSC models 61BT and 32PT. The following TC design features and parameters for the OS197L TC shall be verified by the system user to assure technical agreement with the UFSAR.

1. The OS197L TC decontamination area shielding shall be used for all LOADING OPERATIONS when the TC is not in the spent fuel pool or suspended on the crane. The OS197L TC trailer shielding shall be used for all TRANSFER OPERATIONS. This shielding is necessary to ensure the OS197L TC system provides adequate radiation protection when the TC is not in the pool, or when the TC is not handled by remote operations.
2. The bare OS197L TC, when carrying a loaded DSC, shall be handled using remote operations, including the use of laser/optical targeting and camera for confirmation of the cask location.
3. The placement of the Outer Top Shield of the Transfer Trailer Shield on the loaded OS197L TC shall take place in the FUEL BUILDING unless the FUEL BUILDING load limits would be exceeded. In that case, the placement of the Outer Top Shield takes place outside the FUEL BUILDING. If the placement of the Outer Top Shield is delayed due to building load limits, it must occur as soon as the Transfer Trailer has been moved to an area with acceptable load limits. The licensee must plan accordingly to minimize, to the greatest extent practicable, the delay of the placement of this Outer Top Shield.
4. During TRANSFER OPERATION of a loaded OS197L TC, every hour, visually monitor the Outer Top Trailer Shield vents and the opening around the cask ends for any sign of steaming which may indicate leakage of water from the cask neutron shield (NS). If steaming is determined to be due to leakage of NS water and not due to any rain or snow or other ambient conditions, then licensee must take appropriate corrective actions including use of supplemental cooling or replenishing the NS water or terminating the transfer operation and returning the loaded cask to the FUEL BUILDING for further assessment.

III. RENEWED COC

III.1 72.212 EVALUATIONS FOR RENEWED COC USE

Any general licensee that initiates spent fuel dry storage operations with the Standardized NUHOMS® Horizontal Modular Storage System after the effective date of the renewal of the CoC and any general licensee operating a Standardized NUHOMS® Horizontal Modular Storage System as of the effective date of the renewal of the CoC, including those that put additional storage systems into service after that date, shall:

a. as part of the evaluations required by 10 CFR 72.212(b)(5), include evaluations related to the terms, conditions, and specifications of this CoC amendment as modified (i.e., changed or added) as a result of the renewal of the CoC;

b. as part of the document review required by 10 CFR 72.212(b)(6), include a review of the FSAR changes resulting from the renewal of the CoC and the NRC Safety Evaluation Report related to the renewal of the CoC; and

c. ensure that the evaluations required by 10 CFR 72.212(b)(7) and (8) capture the evaluations and review described in (a.) and (b.) of this CoC condition.

III.2 AMENDMENTS AND REVISIONS FOR RENEWED COC

All future amendments and revisions to this CoC shall include evaluations of the impacts to aging management activities (i.e. time-limited aging analyses and aging management programs) to assure they remain adequate for any changes to SSCs within the scope of renewal.

FOR THE NUCLEAR REGULATORY COMMISSION

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

Appendix A. Inspections, Tests and Evaluations
Appendix B. Technical Specifications
Appendix C. ASME Code Alternatives

Dated: