# 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 | Expiration Date | Docket No. | Amendment No. | Amendment Effective Date | Package Identification No. |
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Issued To: (Name/Address)

Transnuclear, Inc.
7135 Minstrel Way, Suite 300
Columbia, Maryland 21045

Safety Analysis Report Title

Transnuclear, Inc., “Final Safety Analysis Report for the Standardized NUHOMS® Horizontal Modular Storage System for Irradiated Nuclear Fuel”

CONDITIONS

1. Casks authorized by this certificate are hereby approved for use by holders of 10 CFR Part 50 licenses for nuclear power reactors at reactor sites under the general license issued pursuant to 10 CFR 72.210 subject to the conditions specified by 10 CFR 72.212 and the attached Technical Specifications.

2. The holder of this certificate who desires to change the certificate or Technical Specifications shall submit an application for amendment of the certificate or Technical Specifications.

3. CASK:

   a. Model Nos. Standardized NUHOMS®-24P, -52B, -61BT, -32PT, -24PHB, -24PTH, -32PTH1 and -61BTH

   The two digits refer to the number of fuel assemblies stored in the dry shielded canister (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 refer to designs qualified for fuel with burnup greater than 45 GWd/MTU.

   b. Description

   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 system composed of a steel dry shielded canister (DSC), a reinforced concrete horizontal storage module (HSM), and a transfer cask (TC). The welded DSC provides confinement and criticality control for the storage and transfer of irradiated fuel. The concrete module provides radiation shielding while allowing cooling of the DSC and fuel by natural convection during storage. The TC is used for transferring the DSC from/to the Spent Fuel Pool Building to/from the HSM and provides radiation shielding during these operations.

The principal component subassemblies of the DSC are the shell with integral bottom cover plate, bottom shield plug or shield plug assemblies, ram/grapple ring, top shield plug or shield plug assemblies, top cover plate, and basket assembly. The shell length is fuel-specific. The internal basket assembly for the 24P, 24PHB, and 52B DSCs is composed of guide sleeves, support rods, and spacer disks. This assembly is designed to hold 24 PWR fuel assemblies or 52 BWR assemblies.

An alternate basket assembly configuration, the 61BT, consisting of assemblies of stainless steel fuel compartments and steel or aluminum basket rails which provide the transition to the DSC shell, and a holdown ring or grid, is designed to hold 61 BWR assemblies. The 32PT, and 32PTH1 DSC basket assembly configurations are similar, consisting of welded stainless steel plates or tubes that make up a grid of fuel compartments supported by aluminum basket rails, and are designed to accommodate 32 PWR assemblies. The 24 PTH DSC basket assembly configuration consists of stainless steel tubes supported by basket rails and is designed to accommodate 24 PWR assemblies.

The basket assembly aids in the insertion of the fuel assemblies, enhances subcriticality during loading operations, and provides structural support during a hypothetical drop accident. The DSC is designed to slide from the transfer cask into the HSM and back without undue galling, scratching, gouging, or other damage to the sliding surfaces.

The HSM is a reinforced concrete unit with penetrations located at the top and bottom of the walls for air flow, and is designed to store DSCs with up to 24.0 kW decay heat. The penetrations are protected from debris intrusions by wire mesh screens during storage operation. The DSC Support Structure, a structural steel frame with rails, is installed within the HSM. The HSM-H is an enhanced version of the HSM and is designed to store DSCs with up to 40.8 kW decay heat. An alternate version of the HSM-H design, the HSM-HS, has been provided to allow the use of the NUHOMS® system in locations where higher seismic levels exist.

The TC is designed and fabricated as a lifting device to meet NUREG-0612 and ANSI N14.6 requirements. It is used for transfer operations within the Spent Fuel Pool Building and for transfer operations to/from the HSM. The TC is a multi-walled cylindrical vessel, comprised of a gamma shield (steel, lead and steel layers for the Standardized, OS197, OS197H, and the OS200 TCs, and steel only for the OS197L TC) and neutron shield layers with a bottom end closure assembly and a bolted top cover plate. The maximum loaded weight is 110 tons for the Standardized and the OS197 TCs. The maximum loaded weight is 125 tons for the OS197H and OS200 TCs. The maximum loaded weight is 90 tons for the OS197L TC; this weight does not include the decontamination area shielding, or the support skid supplemental shielding. Two upper lifting trunnions are located near the top of the cask for downending/uprighting and lifting of the cask in the Spent Fuel Pool Building. The lower trunnions, located near the base of the cask, serve as the axis of rotation during downending/ uprighting operations and as supports during transport to/from the Independent Spent Fuel Storage Installation (ISFSI). The OS197L TC system consists of the bare cask and the upper and lower decontamination area cask shielding, and the support skid supplemental shielding. The 24P, 52B, and 24PHB DSCs are transferred in a TC with a radial solid or liquid neutron shield. The 61BT, 32PT, 32PTH1, and 61BTH DSCs are transferred in a TC with a radial liquid neutron shield. The neutron shield material for the 24PTH DSC varies, based on the specific model.

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 Technical Specifications.

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.

c. Drawings

The drawings for the Standardized NUHOMS® System are contained in Appendices E, K, M, N, P, T, U and W of the FSAR.

d. Basic Components

The basic components of the Standardized NUHOMS® System that are important to safety are the DSC, HSM, and TC, including the decontamination area shielding and the support skid supplemental shielding for the OS197L TC. These components are described in Section 4.2, Table K.2-8 (Appendix K), Table M.2-18 (Appendix M), Table P.2-17 (Appendix P), Section T.2.3 (Appendix T), Section U.2.3 (Appendix U) and Section W.2.3 (Appendix W) of the FSAR.

4. Notification of fabrication schedules shall be made in accordance with the requirements of 10 CFR 72.232(d).

5. If it is necessary to engage active cooling for the OS197FC, the OS197FC-B, the OS197HFC, the OS197HFC-B, or the OS200FC Transfer Casks during transfer of a loaded DSC, the appropriate NRC Division of Spent Fuel Storage and Transportation Project Manager shall be notified within 30 days, via electronic correspondence, of the occurrence. Appropriate detail should be provided, including the date and time of the occurrence, when the active cooling was initiated, the facility at which the transfer was taking place, and the current state of the DSC.

6. QUALITY ASSURANCE

Activities in the areas of design, purchase, fabrication, assembly, inspection, testing, operation, maintenance, repair, modification of structures, systems and components, and decommissioning shall be conducted in accordance with a quality assurance program that satisfies the applicable requirements of 10 CFR Part 72, Subpart G, and that is established, maintained, and executed with regard to the cask system.

7. HEAVY LOADS REQUIREMENTS

Each lift of a DSC and TC must be made in accordance with the existing heavy loads requirements and procedures of the licensed facility at which the lift is made. A plant-specific safety review (under 10 CFR 50.59 or 10 CFR 72.48, if applicable) is required to show operational compliance with NUREG-0612 and or existing plant-specific heavy loads requirements.

If a single failure proof crane is not used, the licensee must evaluate the accidental drop of the shielding components of the OS197L TC under 10 CFR 50.59, 10 CFR 72.48, and 10 CFR 72.212, and evaluate the consequences of the accident drops.

8. PRE-OPERATIONAL TESTING AND TRAINING EXERCISE

A dry run training exercise of the loading, closure, handling, unloading and transfer of the Standardized NUHOMS® System shall be conducted by each licensee prior to the first use of the system to load spent nuclear fuel assemblies. The training exercise shall not be conducted with spent nuclear fuel in the canister. The dry run may be performed in an alternate step sequence from the actual procedural guidelines in the SAR. The dry run shall include, but need not be limited to the following:

Loading Operations

a. Fuel Loading
b. DSC sealing, drying and backfilling operations
c. TC downending and transport to the ISFSI
d. DSC transfer to the HSM
e. Use of the remote crane operations and laser/optical systems for targeting if the OS197L TC is to be used for loading
f. Manual crane operations if the OS197L TC is to be used for loading

Unloading Operations

a. DSC retrieval from the HSM
b. Flooding of the DSC
c. Opening of the DSC

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Michele Sampson, Chief
Licensing Branch
Division of Spent Fuel Storage
and Transportation
Office of Nuclear Material Safety
and Safeguards

Attachment: A. Technical Specifications

Dated: January 10, 2014