

**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.

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|-------------------------|------------------------------------|---------------------------------------|-----------------------|--------------------|---------------------------------|---|
| Certificate No. 1021 | Effective Date 04/19/00 | Expiration Date 04/19/20 | Docket No. 72-1021 | Amendment No. 0 | Amendment Effective Date --- | Package Identification No. USA/72-1021 |
| | Renewed Effective Date 01/19/22 | Renewed Expiration Date 04/19/2060 | | Revision No 0 | Revision Effective Date 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 TN-32 Dry Storage Cask
Docket No. 72-1021

CONDITIONS

This certificate is conditioned upon fulfilling the requirements of 10 CFR Part 72, as applicable, the attached Appendix A (Technical Specifications), and the conditions specified below:

1. CASK

- a. Model Nos.: TN-32 (standard TN-32, TN-32A, and TN-32B)

The TN-32 dry storage cask consists of a cask and basket assembly. The TN-32A is identical to the standard TN-32 except that it has a shorter lid assembly and longer cavity. The top and bottom plates on the top neutron shield are made correspondingly thicker to provide the same total shielding as the standard TN-32 design. The TN-32B is identical to the standard TN-32 except that the top lifting trunnions are single failure proof. The TN-32 is designed to contain up to 32 intact, unconsolidated pressurized water reactor (PWR) fuel assemblies.

- b. Description

The cask which is being certified is described in the Safety Analysis Report (SAR) and in NRC's Safety Evaluation Report (SER) accompanying the Certificate of Compliance. The TN-32 dry storage cask was designed by Transnuclear to store irradiated PWR spent fuel assemblies at an independent spent fuel storage installation (ISFSI).

The TN-32 cask body is a right circular cylinder composed of the following components: confinement vessel with bolted lid closure, basket for fuel assemblies, gamma shield, trunnions, neutron shield, overpressure monitoring system, and weather cover.

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1. b. Description (continued)

The confinement vessel consists of an inner shell which is a welded, carbon steel cylinder with an integrally-welded, carbon steel bottom closure; a welded flange forging; a carbon steel lid with closure bolts and inner metallic seal; and vent and drain covers with closure bolts and inner metallic seals.

The basket consists of an assembly of stainless steel cells which are welded together and separated by aluminum and neutron absorber plates. The aluminum provides heat conduction paths from the fuel assemblies to the cask cavity and the neutron absorber plates provide criticality control.

The gamma shield encloses the confinement vessel and consists of an independent shell and bottom plate of carbon steel and the steel shell of the neutron shield. Gamma shielding is also provided by the confinement lid.

There are four trunnions attached to the cask body. The top trunnions are used for lifting and the bottom trunnions may be used for rotating the unloaded cask.

The radial neutron shield consists of a borated polyester resin compound which surrounds the gamma shield. The resin compound is cast into long, slender aluminum containers which are enclosed in a smooth outer steel shell. The aluminum containers provide a conduction path for heat transfer from the cask body to the outer shell. Axial neutron shielding is provided by a polypropylene disk placed on the cask lid.

The overpressure monitoring system is used to monitor the pressure in the interspace between the inner and outer seals on the lid, vent, and drain port covers. The overpressure monitoring system consists of a tank filled with helium, pressure transducers or switches, and associated tubing, fittings, and valves.

The torispherical weather cover with a Viton o-ring provides weather protection for the closure lid and seal components, the top neutron shield, and the overpressure system.

The auxiliary equipment necessary for ISFSI operation is not included as part of the TN-32 cask system reviewed for a Certificate of Compliance under 10CFR Part 72, Subpart L. Such equipment may include, but is not limited to, special lifting devices, transfer trailers or equipment, and vacuum drying/helium leak test equipment.

2. OPERATING PROCEDURES

Written operating procedures shall be prepared for cask handling, loading, unloading, movement, surveillance, and maintenance. The user's site-specific written operating procedures shall be consistent with the technical basis described in Chapter 8 of the SAR.

3. ACCEPTANCE TEST AND MAINTENANCE PROGRAM

Written cask acceptance tests and a maintenance program shall be prepared consistent with the technical basis described in Chapter 9 of the SAR.

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4. QUALITY ASSURANCE

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

5. HEAVY LOADS REQUIREMENTS

Each licensed facility must ensure that cask lifting is evaluated in accordance with the existing heavy loads requirements and procedures of the licensed facility in which the lift is made. An additional safety review (under 10 CFR 50.59 or 10 CFR 72.48, if applicable) is required to show operational compliance with existing facility/site-specific heavy loads requirements. The TN-32B lifting attachments have been designed as single failure proof, and are acceptable for use at sites that require single failure proof.

6. APPROVED CONTENTS

Contents of the TN-32 system must meet the specifications given in Appendix A to this certificate.

7. DESIGN FEATURES

Features or characteristics for the site, cask, or ancillary equipment must be in accordance with Appendix A to this certificate.

8. PRE-OPERATIONAL TESTING AND TRAINING EXERCISE

A dry run training exercise of the loading, closure, handling, unloading and transfer of the TN-32 cask shall be conducted by the cask user prior to the first use of the system to load spent fuel assemblies. The dry run may be performed in an alternate step sequence from the actual procedures. The dry run shall include but is not limited to the following:

Preparation of the TN-32 cask for loading and Moving the TN-32 cask into the spent fuel pool.

Selection and verification of specific fuel assemblies to ensure type conformance.

Loading a dummy fuel assembly into the TN-32 and performing appropriate independent verification.

Installation of the TN-32 lid and removal of the TN-32 cask from the spent fuel pool.

Cask draining, vacuum drying, helium backfilling, and leakage testing.

Loading the TN-32 cask onto the cask transporter.

Transferring the cask to the ISFSI.

Placement of the TN-32 cask at the ISFSI.

Unloading operations including reflooding.

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9. SPECIAL REQUIREMENTS FOR CASK THERMAL TESTING

Each agent and/or subcontractor authorized by the certificate holder to complete final assembly of the TN-32 cask body fabricated under this Certificate of Compliance, shall verify the heat transfer performance of a single cask. This test shall be performed prior to the first loading of any cask assembled by that agent and/or subcontractor with a heat load equal to or greater than 23.7 kilowatts.

A letter report summarizing the test performed, measured temperature data, and the calculated results of the test shall be submitted to the NRC in accordance with 10 CFR 72.4 at least 30 days prior to use of a cask loaded with a heat load equal to or greater than 23.7 kilowatts.

Proposed modifications to the fabrication process shall be evaluated for their potential to impact the heat transfer performance of the cask body. If the modification could result in adverse impact to the heat transfer performance of the cask body, the heat transfer performance of the modified cask shall be verified by an additional thermal test, prior to loading the first modified cask with a heat load equal to or greater than 23.7 kilowatts. The results of additional thermal tests shall be retained in accordance with 10 CFR 72.234(d).

10. CHANGES TO THE CERTIFICATE OF COMPLIANCE

The holder of this certificate who desires to make changes to this certificate, which includes Appendix A (Technical Specifications), shall submit an application for amendment of the certificate.

11. AUTHORIZATION

The TN-32 system, which is authorized by this certificate, is hereby approved for general use by holders of 10 CFR Part 50 licenses for nuclear 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 Appendix A.

12. UFSAR UPDATE FOR RENEWED COC

The CoC holder shall submit an updated final safety analysis report (UFSAR) to the Commission, in accordance with 10 CFR 72.4, within 90 days of the effective date of the renewal. The UFSAR shall reflect the changes and CoC holder commitments resulting from the review and approval of the renewal of the CoC. The CoC holder shall continue to update the UFSAR pursuant to the requirements of 10 CFR 72.248.

13. 72.212 EVALUATIONS FOR RENEWED COC USE

Any general licensee that initiates spent fuel dry storage operations with the TN-32 dry storage cask system after the effective date of the CoC renewal and any general licensee operating a TN-32 dry storage cask system as of the effective date of the CoC renewal, 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 UFSAR changes resulting from the renewal of the CoC and the NRC Safety Evaluation Report related to the renewal of the CoC; and

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- 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.

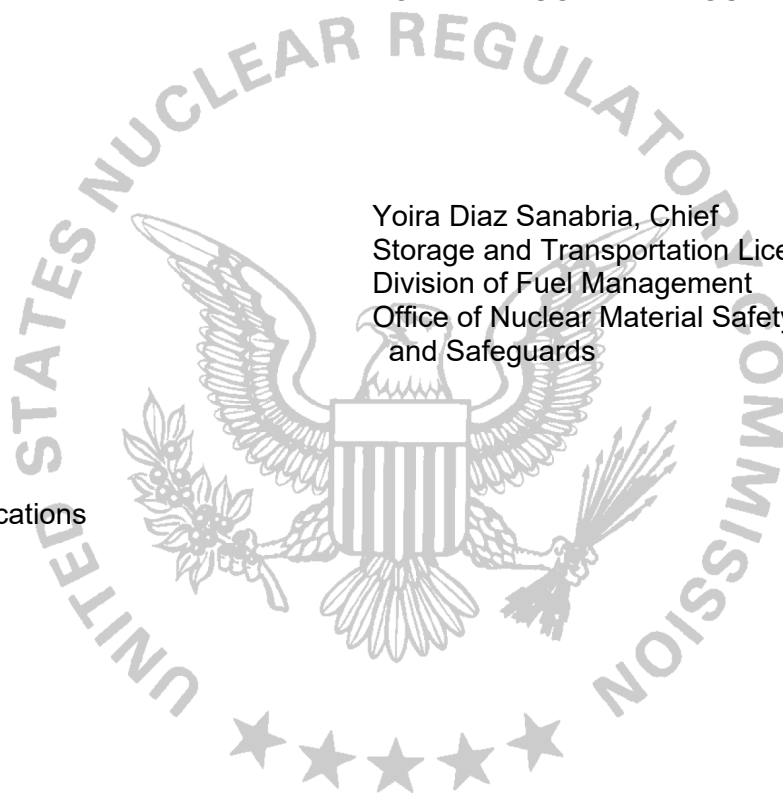
The general licensee shall complete Condition 13 prior to entering the period of extended operation or no later than one year after the effective date of the CoC renewal, whichever is later.

14. 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 ensure that they remain adequate for any changes to SSCs within the scope of renewal.

FOR THE NUCLEAR REGULATORY COMMISSION

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



Attachment:
Appendix A. Technical Specifications

Dated: December 8, 2021