CALVERT CLIFFS

INDEPENDENT SPENT FUEL STORAGE INSTALLATION

APPENDIX "A"
TO
MATERIALS LICENSE SNM-2505

TECHNICAL SPECIFICATIONS

ISSUED BY THE UNITED STATES NUCLEAR REGULATORY COMMISSION

Amendment 7

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REVISION HISTORY

	Page: Section	Change Description
Amendment No. 7	NA	Change in Final Safety Analysis Report design basis limit for the dry shielded canister, no changes to Technical Specifications
Amendment No. 6	Table of contents	Renumbered section 5.1, and added section 5.2
	Page 2: 2.1	Changed SAR table reference and added neutron source term for NUHOMS–32P canister
	Page 5: 3.1.1(4), 3.1.1(5), 3.3.1(6), 3.3.1(7), and 3.3.1(9)	Made changes to support use of either NUHOMS-24P or NUHOMS-32P canister
	Page 7: 3.2.1.1, 4.2.1.1, and 4.2.1.2	increased the required spent fuel pool boron concentration, increased surveillance requirement action times.
	Page 5: 5.1 and 5.2	Renumbered section 5.1, and added section 5.2
Amendment No. 5	Page 4: Section 2.3	Removed reference to Transfer Cask drop height limit.
	Page 13: Section 6.3	Changed semi-annual reporting period to annual reporting period and corrected typographical error.
Amendment No. 4	NA	Change in Final Safety Analysis Report aircraft hazards analysis, no changes to Technical Specifications

Amendment No. 3	Pages 1-13	Renumbered and updated page format.
	Previous page iv: Introduction	Corrected typographical error.
	Previous pages B 2-1 - B 2-4	Removed Bases Section.
	Previous page 3/4 1-1: 3.1.1	Editorial change for clarity.
	Previous page 3/4 4-1: 3.4.1.1	Corrected typographical error.
	Previous pages B 3/4-1 - B 3/4-5	Removed Bases Section.
Amendment No. 2	6-1: 6.1	Changed operator name from Baltimore Gas and Electric Company to Calvert Cliffs Nuclear Power Plant, Inc.
Amendment No. 1	2-2: 2.2.1	Added "*" paragraph on vacuum drying exemption for first and second DSC.
	B2-2: 2.2.1	Added "*" paragraph on basis for vacuum drying exemption for first and second DSC.

INTRODUCTION

These Technical Specifications govern the safety of the receipt, possession, and storage of irradiated nuclear fuel at the Calvert Cliffs Independent Spent Fuel Storage Installation and the transfer of such irradiated nuclear fuel to and from Units 1 and 2 of the Calvert Cliffs Nuclear Power Plant and the Calvert Cliffs Independent Spent Fuel Storage Installation. The protection of the environment during the activities described above is also governed under these technical specifications. The loading of spent fuel into the dry shielded canister (DSC) and transfer cask (TC) at the Calvert Cliffs Nuclear Power Plant Auxiliary Building is governed by the existing Calvert Cliffs 10 CFR Part 50 operating license (DPR-53 and -69), technical specifications, and new specific procedures.

1.0 DEFINITIONS

The following definitions apply for the purpose of these Technical Specifications:

a. ADMINISTRATIVE CONTROLS: Provisions relating to organization operating, emergency, and management procedures, recordkeeping, review and audit, and reporting necessary to ensure that the operations involved in the movement, transfer and storage of spent fuel at the Calvert Cliffs ISFSI are performed in a safe manner.

b. DESIGN FEATURES: Features of the facility associated with the basic design such as materials of construction, geometric arrangements, dimensions, etc., which, if altered or modified, could have a significant effect on safety.

c. FUEL ASSEMBLY: The unit of nuclear fuel in the form that is charged or discharged from the core of a light-water reactor (LWR). Normally, will consist of a rectangular arrangement of fuel and non-fuel held together by end fittings, spacers, and guide tubes.

d. FUNCTIONAL AND OPERATING LIMITS: Limits on fuel handling and storage conditions necessary to protect the integrity of the stored fuel, to protect employees against occupational exposures, and to guard against the uncontrolled release of radioactive materials.

e. LIMITING CONDITIONS: The minimum or maximum functional capabilities or performance levels of equipment required for safe operation of the facility.

f. LOADING OPERATIONS: Loading Operations include all cask preparation steps prior to cask transport from the auxiliary building area.

g. SURVEILLANCE INTERVAL: A surveillance interval is the interval between a surveillance check, test or calibration. Unless specifically stated otherwise, each surveillance requirement shall be performed within the specified time interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval.

h. SURVEILLANCE REQUIREMENTS: Surveillance requirements include: (i) inspection, test, and calibration activities to ensure that the necessary integrity of required systems, components, and the spent fuel in storage is maintained; (ii) confirmation that operation of the installation is within the required functional and operating limits; and (iii) a confirmation that the limiting conditions required for safe storage are met.

2.0 FUNCTIONAL AND OPERATING LIMITS

2.1 FUEL TO BE STORED AT ISFSI

SPECIFICATION: Any fuel not specifically filling the requirements of Section 3.1 for maximum burnup and post irradiation time may be stored if it meets the minimum cooling time listed in the Calvert Cliffs ISFSI SAR Table 9.4.1 and all the following requirements are met:

Neutron Source Per Assembly (NUHOMS-24P)	# 2.23×10^{8} n/sec/assembly, with spectrum bounded by Table 3.1-4 of the Calvert Cliffs ISFSI SAR
Neutron Source Per Assembly (NUHOMS-32P)	# 3.3×10^{8} n/sec/assembly, with spectrum bounded by Table 3.1-4 of the Calvert Cliffs ISFSI SAR
Gamma Source Per Assembly	# 1.53×10^{15} MeV/sec/assembly with spectrum bounded by that shown in Table 3.1-4 of the Calvert Cliffs ISFSI SAR

APPLICABILITY: This specification is applicable to all spent fuel to be stored in the Calvert Cliffs ISFSI.

ACTION: If the requirements of the above specification are not met, do not load the fuel assembly into a DSC for storage.

2.2 DRY SHIELDED CANISTER (DSC)

2.2.1 DSC VACUUM DURING DRYING

SPECIFICATION*: The DSC Cavity vacuum pressure during canister drying shall not exceed 3 torr (3 mm Hg) after stepped evacuation. The vacuum pressure shall be maintained for not less than 30 minutes.

APPLICABILITY: Applicable to all DSCs.

ACTION: If the required vacuum cannot be obtained.

1. Check and repair vacuum drying system as necessary.

2. Check and repair the DSC welds as necessary.

If the specification is still not met, remove fuel from the DSC.

* The first and second DSCs (Serial Nos. BGE 24P-R011 & BGE 24P-R002) placed in HSM Nos. 1&2, respectively, are exempted from this specification (see License Amendment No. 1).

2.2.2 DSC HELIUM BACKFILL PRESSURE

SPECIFICATION: The DSC cavity shall be backfilled with helium. The backfill pressure shall be 2.5 psig $\pm$ 2.5 psi.

APPLICABILITY: Applicable to all DSCs.

ACTION: If the required pressure cannot be obtained:

1. Check and repair the vacuum drying system as necessary.

2. Check and repair the DSC welds as necessary.

3. If the backfill pressure exceeds the criterion, release a sufficient quantity of helium to lower the DSC cavity pressure.

If the specification is still not met, remove fuel from the DSC.

2.3 TRANSFER CASK (TC)

SPECIFICATION: The transfer cask lifting height with a non-single-failure-proof lifting device shall not exceed 80 inches.

APPLICABILITY: This specification applies to handling of a loaded ISFSI transfer cask outside the Auxiliary Building.

ACTION: In the event of a transfer cask drop with fuel in a DSC and the DSC in the TC, the fuel shall be returned to the spent fuel pool and visually inspected. If the spent fuel meets the requirements for storage in the ISFSI, the fuel may be subsequently transferred to the ISFSI. The DSC shall be removed from service and evaluated for further use or disposed of, as may be appropriate.

2.4 HORIZONTAL STORAGE MODULE (HSM)

SPECIFICATION: The contact dose rate on the surface of the HSM access door shall not exceed 100 mrem/hr (1 mSv/hr). The contact dose rate on the surface of the HSM sides shall not exceed 20 mrem/hr (0.2 mSv/hr).

APPLICABILITY: This specification is applicable to initially loaded HSMs

ACTION: If the above dose rates are exceeded, take immediate action to determine the cause and bring down the dose rate to an acceptable level. If an acceptable level cannot be achieved, the DSC shall be removed from the HSM and returned to the spent fuel pool.

3/4.1 FUEL TO BE STORED AT ISFSI

LIMITING CONDITION FOR OPERATION

3.1.1 The spent nuclear fuel to be received and stored at the Calvert Cliffs ISFSI shall meet the following requirements:

(1) Only fuel irradiated at the Calvert Cliffs Units 1 or 2 may be used. (14 x 14 CE type PWR Fuel)

(2) Maximum initial enrichment shall not exceed 4.5 weight percent U-235.

(3) Maximum assembly average burnup shall not exceed 47,000 megawatt-days per metric ton uranium.

(4) Minimum burnup shall exceed the minimum specified in SAR Figure 3.3-1. (Applicable only to NUHOMS-24P.)

(5) Maximum heat generation rate shall not exceed 0.66 kilowatt per fuel assembly.

(6) Fuel shall have cooled as specified in ISFSI SAR Table 9.4.1.

(7) Maximum assembly mass including control components shall not exceed 1450 lb.(658 kg).

(8) Fuel shall be intact unconsolidated fuel.

(9) Fuel assemblies known or suspected to have structural defects (other than pinhole leaks) sufficiently severe to adversely affect fuel handling and transfer capability shall not be loaded into the DSC for storage.

APPLICABILITY: This specification is applicable to all spent fuel to be stored in Calvert Cliffs ISFSI.

ACTION: If any fuel does not specifically meet the requirements for maximum burnup and post irradiation time (items 3 & 6 above), confirm to see if the requirements of Section 2.1 are satisfied. If any other requirements of the above specification are not satisfied, do not load the fuel assembly into a DSC for storage.

3/4.1 FUEL TO BE STORED AT ISFSI

SURVEILLANCE REQUIREMENTS

4.1.1 Prior to insertion of a spent fuel assembly into a DSC, the identity of the assembly shall be independently verified by two individuals and shall be documented.

4.1.2 Each spent fuel assembly to be loaded into a DSC shall have the parameters listed in Section 3.1 independently verified by two individuals and documented.

3/4.2 DRY SHIELDED CANISTER (DSC)

3/4.2.1 DISSOLVED BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.2.1.1 The DSC cavity shall be moderated only by water with a boron concentration greater than or equal to 2,450 ppm.

APPLICABILITY: Applicable to all DSCs.

ACTION:

1. With the measured boron concentration less than the specification prior to the beginning of DSC loading and unloading operations, suspend all activities involving DSC loading and unloading.

2. With the measured boron concentration less than the specification during DSC loading and unloading operations, take action to increase boron concentration while unloading fuel from the DSC.

SURVEILLANCE REQUIREMENTS

4.2.1.1 Within 4 hours prior to insertion of the first spent fuel assembly into a DSC, the dissolved boron concentration in water in the spent fuel pool and introduced into the DSC cavity shall be independently determined by chemical analysis (two samples analyzed by two different individuals). The boron concentration in the water shall be reconfirmed at intervals not to exceed 48 hours until such time as the DSC is removed from the spent fuel pool. All boron concentration measurement shall be documented.

4.2.1.2 Within 4 hours prior to flooding the DSC cavity for unloading the fuel assemblies, the dissolved boron concentration in water in the spent fuel pool and introduced into the DSC cavity shall be independently determined by chemical analysis (two samples analyzed by two different individuals). The boron concentration in the water shall be reconfirmed at intervals not to exceed 48 hours until such time as the fuel has been removed from the DSC. All boron concentration measurements shall be documented.

3/4.2 DRY SHIELDED CANISTER (DSC)

3/4.2.2 DSC CLOSURE WELDS

LIMITING CONDITION FOR OPERATION

3.2.2.1 The top shield plug closure weld, the siphon and vent port cover welds, and the top cover plate weld shall satisfy the Liquid Penetrant Acceptance Standards of ASME B&PV Code Section III, Division 1, Subsection NB-5350 (1983).

3.2.2.2 The standard helium leak rate for the top shield plug closure weld, and the siphon and vent port cover welds shall not exceed 10^{-4}atm-cc/s.

APPLICABILITY: Applicable to all DSCs.

ACTION: With the requirements of the above specifications not satisfied, the weld shall be repaired in accordance with approved procedures and re-examined in accordance with these specifications.

SURVEILLANCE REQUIREMENT

4.2.2.1 During DSC loading operations, the top shield plug closure and the siphon and vent port cover welds shall be tested using a helium leak detector to ensure that, for each weld, leak tightness is less than or equal to 10^{-4}atm-cc/s. These welds and the DSC top cover plate weld shall be dye penetrant tested.

3/4.2.3 DSC EXTERIOR SURFACE CONTAMINATION

LIMITING CONDITION FOR OPERATION

3.2.3.1 Removable contamination on the DSC exterior shall be less than 22,000 dpm/100 cm^2 (3.7 Bq/cm^2) from beta and gamma sources, and 2,200 dpm/100 cm^2 (0.37 Bq/cm^2) from alpha sources.

APPLICABILITY: Applicable to all DSCs.

ACTION: With the DSC contamination level in excess of the above specification, the DSC shall not be inserted in the HSM. If already inserted, it shall be removed from the HSM and both DSC and the HSM shall be decontaminated to meet the specification before the DSC is re-inserted in the HSM.

SURVEILLANCE REQUIREMENTS

4.2.3.1 Prior to inserting the DSC into the Transfer Cask (TC), the TC interior shall be smeared to ensure that removable contamination levels on the interior surfaces of the cask, excluding the drain and vent lines, are less than 22,000 dpm/100 cm^2 (3.7 Bq/cm^2) from beta and gamma sources, and 2,200 dpm/100 cm^2 (0.37 Bq/cm^2) from alpha sources.

4.2.3.2 After fuel loading, but prior to moving the loaded DSC and TC to the HSM, the top of the sealed DSC, the top six inches of the DSC sides, and the TC exterior surfaces shall be smeared to ensure that removable contamination levels are less than 22,000 dpm/100 cm^2 (3.7 Bq/cm^2) from beta and gamma sources, and 2,200 dpm/100 cm^2 (0.37 Bq/cm^2) from alpha sources.

4.2.3.3 After TC unloading, the interior surfaces of the cask shall be smeared to ensure that removable contamination levels on the interior surfaces of the cask, excluding drain and vent lines, are less than 22,000 dpm/100 cm^2 (3.7 Bq/cm^2) from beta and gamma sources, and 2,200 dpm/100 cm^2 (0.37 Bq/cm^2) from alpha sources.

3/4.3 TRANSFER CASK (TC)

3/4.3.1 AMBIENT TEMPERATURE

LIMITING CONDITION FOR OPERATION

3.3.1.1 Fuel transfer operations to and from the ISFSI, in the transfer cask, shall not take place when daylight ambient temperatures exceed 103EF(39.4EC).

APPLICABILITY: This specification is applicable to all outdoor spent fuel transfer operations.

ACTION: If the daylight ambient temperature is expected to exceed of the above specification, do not commence a fuel transfer operation from the Auxiliary Building; if fuel transfer operation from the HSM is required because of another specification, provide shading. If the daylight ambient temperature exceeds 100EF during transfer operation, provide shading.

SURVEILLANCE REQUIREMENT

4.3.1.1 When temperatures are expected to approach 100EF (37.8EC) or more, the outdoor ambient temperature in full sunlight shall be measured and recorded within one-half hour prior to movement of a TC loaded with fuel, to or from the ISFSI. Additionally, the outdoor ambient temperature in full sunlight shall be measured and recorded once per hour when the loaded transfer cask is outside the Auxiliary Building.

3/4.4 HORIZONTAL STORAGE MODULE (HSM)

3/4.4.1 MAXIMUM AIR TEMPERATURE RISE

LIMITING CONDITION FOR OPERATION

3.4.1.1 The air temperature rise from the HSM inlet to the HSM outlets shall not exceed 60EF (33.3EC).

APPLICABILITY: Applicable to all HSMs.

ACTION: If the temperature rise is greater than 60EF, (33.3EC) the air inlet and outlets should be checked for blockage. If any blockage is cleared and the temperature rise is still greater than 60EF, (33.3EC) the DSC and HSM cavity shall be inspected, using video equipment or other suitable means. Analysis of the existing conditions shall be performed to confirm that conditions adversely affecting the fuel cladding integrity do not exist. Subsequent actions to return to acceptable conditions such as, providing temporary forced ventilation and/or retrieval of the DSC and verification that an assembly fuel with no more than 0.66 kW was loaded shall be performed.

SURVEILLANCE REQUIREMENTS

4.4.1.1. The maximum temperature rise from the HSM inlet to outlets shall be checked at the time the DSC is stored in the HSM, again 24 hours later, and again after 7 days.

4.4.1.2 The HSM shall be visually inspected to verify that the air inlet and outlets are free from obstructions when there is fuel in the HSM. The visual inspection frequency shall be every 24 hours.

3/4.5 FIRE PROTECTION

LIMITING CONDITION FOR OPERATION

3.5.1 Only diesel powered vehicles with fuel tank capacity not more than 100 gallons (0.38 m^3) shall be permitted within the ISFSI fenced area. When such vehicles are present, portable fire suppression equipment shall be present in the ISFSI fenced area.

3.5.2 During spent fuel transfer operations to and from the Auxiliary Building and the ISFSI fenced area, there shall be no fossil fuel tanker truck movements or fossil fuel transfer operations to or from such trucks on the Calvert Cliffs Nuclear Plant Site inside the plant site entrances. Any such tanker trucks shall not be located within 100 meters of the ISFSI fenced area and transfer route during spent fuel transfer operations.

APPLICABILITY: Specification 3.5.1 is applicable whenever there is spent fuel in the ISFSI or during all spent fuel transfer operations between the Auxiliary Building and the ISFSI. Specification 3.5.2 is applicable only during spent fuel transfer operations.

ACTION: With the requirements of the above specifications not satisfied, do not remove the loaded Transfer Cask (TC) from the Auxiliary Building or do not remove a DSC from the HSM.

SURVEILLANCE REQUIREMENT

4.5.1 Prior to removal of the loaded TC from the Auxiliary Building or a DSC from the HSM, a visual inspection of the transfer route shall be made to ensure compliance with the above specifications.

5.0 DESIGN FEATURES

5.1 GENERAL

The Calvert Cliffs ISFSI design approval was based upon review of specific design drawings, some of which have been deemed appropriate for inclusion in the Calvert Cliffs ISFSI Safety Evaluation Report (SER). Drawings listed in Section 1.5 of the Calvert Cliffs ISFSI SER have been reviewed and approved by the NRC. These drawings may be revised under the provisions of 10 CFR 72.48 as appropriate.

5.2 NUHOMS-32P DRY SHIELDED CANISTER (DSC)

The NUHOMS-32P DSC poison plates shall have a minimum B10 areal density of 0.0100g/cm^2.

6.0 ADMINISTRATIVE CONTROLS

6.1 GENERAL

The Calvert Cliffs ISFSI is located on the Calvert Cliffs Nuclear Power Plant site and will be managed and operated by the Calvert Cliffs Nuclear Power Plant, Inc., staff. The administrative controls shall be in accordance with the requirements of the Calvert Cliffs Nuclear Power Plant Facility Operating Licenses (DPR-53, and -69) and associated Technical Specifications as appropriate.

6.2 ENVIRONMENTAL MONITORING PROGRAM

The licensee shall include the Calvert Cliffs ISFSI in the environmental monitoring for Calvert Cliffs Nuclear Power Plant. An environmental monitoring program is required pursuant to 10 CFR 72.44(d)(2).

6.3 ANNUAL ENVIRONMENTAL REPORT

The annual radioactive effluent release reports under 10 CFR 50.36(a)(2) license requirements for the Calvert Cliffs Nuclear Power Plant shall also specify the quantity, if any, of each of the principal radionuclides released to the environment in liquid and gaseous effluents during the ISFSI operation and such other information as may be required by the Commission to estimate maximum potential radiation dose commitment to the public resulting from effluent releases. Copies of these reports shall be submitted to the NRC Region I office and to the Director, Office of Nuclear Material Safety and Safeguards. The report under this specification is required pursuant to 10 CFR 72.44(d)(3).