

CoC 1004 STANDARDIZED NUHOMS® Amendment 10 Application

NON-PROPRIETARY

Technical Specifications Changes UFSAR Chapter 1 Changes UFSAR Appendix M Changes UFSAR Appendix P Changes Appendix T – 61BTH Part 1 of 2

VOLUME 1 OF 4

TRANSNUCLEAR INC.

ATTACHMENT A

TECHNICAL SPECIFICATIONS

TRANSNUCLEAR, INC.

STANDARDIZED NUHOMS® HORIZONTAL MODULAR STORAGE SYSTEM

CERTIFICATE OF COMPLIANCE NO. 1004

AMENDMENT NO. 10

DOCKET 72-1004

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1.0 INTRODUCTION

This section presents the conditions which a potential user (general licensee) of the standardized NUHOMS[®] system must comply with, in order to use the system under the general license in accordance with the provisions of 10 CFR 72.210 and 10 CFR 72.212. These conditions have either been proposed by the system vendor, imposed by the NRC staff as a result of the review of the FSAR, or are part of the regulatory requirements expressed in 10 CFR 72.212.

As referenced in this document, the term "HSM" is applicable to both the Standardized HSM and the HSM-H modules unless the applicability of one of the Technical Specifications contained in this document is limited to a specific HSM model.

As referenced in this document, the term "Transfer Cask" or "TC" is applicable to both the standardized transfer cask and the "OS197" type transfer cask unless the applicability of one of the Technical Specifications contained in this document is limited to a specific transfer cask model.

1.1 General Requirements and Conditions

1.1.1 Regulatory Requirements for a General License

Subpart K of 10 CFR Part 72 contains conditions for using the general license to store spent fuel at an independent spent fuel storage installation at power reactor sites authorized to possess and operate nuclear power reactors under 10 CFR Part 50. Technical regulatory requirements for the licensee (user of the standardized NUHOMS[®] system) are contained in 10 CFR 72.212(b).

Under 10 CFR 72.212(b)(2) requirements, the licensee must perform written evaluations, before use, that establish that: (1) conditions set forth in the Certificate of Compliance have been met; (2) cask storage pads and areas have been designed to adequately support the static load of the stored casks; and (3) the requirements of 10 CFR 72.104 "Criteria for radioactive materials in effluent and direct radiation from an ISFSI or MRS," have been met. In addition, 10 CFR 72.212(b)(3) requires that the licensee review the FSAR and the associated SER, before use of the general license, to determine whether or not the reactor site parameters (including earthquake intensity and tornado missiles), are encompassed by the cask design bases considered in these reports.

The requirements of 10 CFR 72.212(b)(4) provide that, as a holder of a Part 50 license, the user, before use of the general license under Part 72, must determine whether activities related to storage of spent fuel involve any unreviewed safety issues, or changes in technical specifications as provided under 10 CFR 50.59. Under 10 CFR 72.212(b)(5), the general license holder shall also protect the spent fuel against design basis threats and radiological sabotage pursuant to 10 CFR 73.55. Other general license requirements dealing with review of reactor emergency plans, quality assurance program, training, and radiation protection program must also be satisfied pursuant to 10 CFR 72.212(b)(6). Records and procedural requirements for the general license holder are described in 10 CFR 72.212(b)(7), (8), (9) and (10).

Without limiting the requirements identified above, site-specific parameters and analyses, identified in the SER, that will need verification by the system user, are as a minimum, as follows:

- 1. The temperature of 70°F as the maximum average yearly temperature with solar incidence *for the 24P, 52B and 61BT DSCs.* The average daily ambient temperature shall be 100°F or less *for the 24P, 52B, 61BT, 32PT, 24PHB, 61BTH, and 24PTH DSCs. For the 32PTH1 DSC, the average daily ambient temperature shall be 106°F or less.*
- The temperature extremes either of 125°F with incident solar radiation (for the 24P, 52B, and 61BT DSCs) or 117°F with solar incidence (for the 32PT, 24PHB, 24PTH, 61BTH and 32PTH1 DSCs) and -40°F with no solar incidence for storage of the DSC inside the HSM. The 117°F extreme ambient temperature corresponds to a 24 hour calculated average temperature of 102°F *for the 32PT DSC only*.
- 3. The horizontal and vertical seismic acceleration levels of 0.25g and 0.17g, respectively *for the systems using the Standardized HSMs*.

The horizontal and vertical seismic acceleration levels for the HSM-H are payload specific as described below:

- 0.3g horizontal and 0.2g vertical for the 24PTH and 61BTH DSCs,
- 0.3g horizontal and 0.25g vertical for the 32PTH1 DSC, and
- 1.0g horizontal and 1.0g vertical for the "high-seismic" HSM-H option with 32PTH1 DSC.
- 4. The analyzed flood condition of 15 fps water velocity and a height of 50 feet of water (full submergence of the loaded HSM DSC).
- 5. The potential for fire and explosion should be addressed, based on site-specific considerations.
- 6. The HSM foundation design criteria are not included in the FSAR. Therefore, the nominal FSAR design or an alternative should be verified for individual sites in accordance with 10 CFR 72.212(b)(2)(ii). Also, in accordance with 10 CFR 72.212(b)(3), the foundation design should be evaluated against actual site parameters to determine whether its failure would cause the standardized NUHOMS[®] system to exceed the design basis accident conditions.
- 7. The potential for lightning damage to any electrical system associated with the standardized NUHOMS[®] system (e.g., thermal performance monitoring) should be addressed, based on site-specific considerations.
- 8. If an independent spent fuel storage installation 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-H shall be procured with a minimum 0.20 percent copper content for corrosion resistance.
- 9. Any other site parameters or consideration that could decrease the effectiveness of cask systems important to safety.

In accordance with 10 CFR 72.212(b)(2), a record of the written evaluations must be retained by the licensee until spent fuel is no longer stored under the general license issued under 10 CFR 72.210.

1.1.2 Operating Procedures

Written operating procedures shall be prepared for cask handling, loading, movement, surveillance, and maintenance. The operating procedures suggested generically in the FSAR should provide the basis for the user's written operating procedure. The following additional procedure requested by NRC staff should be part of the user operating procedures:

If fuel needs to be removed from the DSC, either at the end of service life or for inspection after an accident, precautions must be taken against the potential for the presence of damaged or oxidized fuel and to prevent radiological exposure to personnel during this operation. This can be achieved with this design by the use of the purge and fill valves which permit a determination of the atmosphere within the DSC before the removal of the inner top cover and shield plugs, prior to filling the DSC cavity with water (borated water for the 24P or 32PT or 24PHB or 24PTH or 32PTH1). If the atmosphere within the DSC is helium, then operations should proceed normally with fuel removal either via the transfer cask or in the pool. However, if air is present within the DSC, then appropriate filters should be in place to preclude the uncontrolled release of any potential airborne radioactive particulate from the DSC via the purge-fill valves. This will protect both personnel and the operations area from potential contamination. For the accident case, personnel protection in the form of respirators or supplied air should be considered in accordance with the licensee's Radiation Protection Program.

1.1.3 Quality Assurance

Activities at the ISFSI shall be conducted in accordance with a Commission-approved quality assurance program which satisfies the applicable requirements of 10 CFR Part 50, Appendix B, and which is established, maintained, and executed with regard to the ISFSI.

1.1.4 Heavy Loads Requirements

Lifts of the DSC in the TC must be made within the existing heavy loads requirements and procedures of the licensed nuclear power plant. The TC design has been reviewed under 10 CFR Part 72 and found to meet NUREG-0612 and ANSI N14.6. However, an additional safety review (under 10 CFR 50.59) is required to show operational compliance with NUREG-0612 and/or existing plant-specific heavy loads requirements.

1.1.5 Training Module

A training module shall be developed for the existing licensee's training program establishing an ISFSI training and certification program. This module shall include the following:

- 1. Standardized NUHOMS[®] Design (overview);
- 2. ISFSI Facility Design (overview);
- 3. Certificate of Compliance conditions (overview);
- 4. Fuel Loading, Transfer Cask Handling, DSC Transfer Procedures; and

5. Off-Normal Event Procedures.

1.1.6 Pre-Operational Testing and Training Exercise

A dry run of the DSC loading, TC handling and DSC insertion into the HSM shall be held. This dry run shall include, but not be limited to, the following:

- 1. Functional testing of the TC with lifting yokes to ensure that the TC can be safely transported over the entire route required for fuel loading, washdown pit (decontamination area) and trailer loading.
- 2. DSC loading into the TC to verify fit and TC/DSC annulus seal.
- 3. Testing of TC on transport trailer and transported to ISFSI along a predetermined route and aligned with an HSM.
- 4. Testing of transfer trailer alignment and docking equipment. Testing of hydraulic ram to insert a DSC loaded with test weights into an HSM and then retrieve it.
- 5. Loading a mock-up fuel assembly into the DSC.
- 6. DSC sealing, vacuum drying, and cover gas backfilling operations (using a mock-up DSC).
- 7. Opening a DSC (using a mock-up DSC).
- 8. Returning the DSC and TC to the spent fuel pool.
- 1.1.7 Special Requirements for First System in Place

The heat transfer characteristics of the cask system will be recorded by temperature measurements of the first DSC placed in service. The first DSC shall be loaded with assemblies, constituting a source of approximately 24 kW in HSM (approximately 40.8 kW in HSM-H). The DSC shall be loaded into the HSM, and the thermal performance will be assessed by measuring the air inlet and outlet temperatures for normal airflow. Details for obtaining the measurements are provided in Section 1.2.8, under "Surveillance."

A letter report summarizing the results of the measurements shall be submitted to the NRC for evaluation and assessment of the heat removal characteristics of the cask in place within 30 days of placing the DSC in service, in accordance with 10 CFR 72.4.

Should the first user of the system not have fuel capable of producing a 24 kW heat load (40.8 kW heat load for 24PTH *or 32PTH1* DSC), or be limited to a lesser heat load, as in the case of BWR fuel, the user may use a lesser load for the process, provided that a calculation of the temperature difference between the inlet and outlet temperatures is performed, using the same methodology and inputs documented in the FSAR, with lesser load as the only exception. The calculation and the measured temperature data shall be reported to the NRC in accordance with 10 CFR 72.4. The calculation and comparison need not be reported to the NRC for DSCs that are subsequently loaded with lesser loads than the initial case. However, for the first or any other user, the process needs to be performed and reported for any higher heat sources, up to 24 kW for PWR fuel stored in the 24P or 32PT or 24PHB or 24PTH-S-LC; up to 40.8 kW for PWR fuel stored in the 61BT, *22.0 kW for a Type 1 61BTH, and 31.2 kW for a Type 2 61BTH DSC*, which are the maximum allowed under the Certificate of Compliance for these

specific DSCs. The NRC will also accept the use of artificial thermal loads other than spent fuel, to satisfy the above requirement.

1.1.8 Surveillance Requirements Applicability

The specified frequency for each Surveillance Requirement is met if the surveillance is performed within 1.25 times the interval specified in the frequency, as measured from the previous performance.

For frequencies specified as "once," the above interval extension does not apply.

If a required action requires performance of a surveillance or its completion time requires period performance of "once per...," the above frequency extension applies to the repetitive portion, but not to the initial portion of the completion time.

Exceptions to these requirements are stated in the individual specifications.

1.1.9 Supplemental Shielding

Supplemental shielding and engineered features (e.g., earthen berms, shield walls) that are used to ensure compliance with 10 CFR 72.104(a) by each general licensee are to be considered important to safety and must be appropriately evaluated under 10 CFR 72.212(b).

1.1.10 HSM-H Storage Configuration

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

For the high seismic HSM-H option, a minimum of three (3) HSM-Hs must be connected with each other.

1.2 Technical Specifications, Functional and Operating Limits

1.2.1 Fuel Specifications

Limit/Specification:	The characteristics of the spent fuel which is allowed to be stored in the standardized NUHOMS [®] system are limited by those included in Tables 1-1a, 1-1b, 1-1c, 1-1d, 1-1e, 1-1f, 1-1g, 1-1i, 1-1j, 1-1l, 1-1m, $1-1t$, $1-1u$, $1-1aa$, and $1-1bb$.
Applicability:	The specification is applicable to all fuel to be stored in the standardized $\mathrm{NUHOMS}^{\circledast}$ system.
Objective:	The specification is prepared to ensure that the peak fuel rod cladding temperatures, maximum surface doses, and nuclear criticality effective neutron multiplication factor are below the design limits. Furthermore, the fuel weight and type ensures that structural conditions in the FSAR bound those of the actual fuel being stored.
Action:	Each spent fuel assembly to be loaded into a DSC shall have the parameters listed in Tables 1-1a, 1-1b, 1-1c, 1-1d, 1-1e, 1-1f, 1-1g, 1-1i, 1-1j, 1-11, 1-1m, <i>1-1t</i> , <i>1-1u</i> , <i>1-1aa</i> , and <i>1-1bb</i> verified and documented. Fuel not meeting this specification shall not be stored in the standardized NUHOMS [®] system.
Surveillance:	Prior to loading of a spent fuel assembly into a DSC, the identity of each fuel assembly shall be independently verified and documented.
Bases:	The specification is based on consideration of the design basis parameters included in the FSAR and limitations imposed as a result of the staff review. Such parameters stem from the type of fuel analyzed, structural limitations, criteria for criticality safety, criteria for heat removal, and criteria for radiological protection. The standardized NUHOMS [®] system is designed for dry, horizontal storage of irradiated light water reactor (LWR) fuel. The principal design parameters of the fuel to be stored can accommodate standard PWR fuel designs manufactured by Babcock and Wilcox (B&W), Combustion Engineering (CE), and Westinghouse (WE), and standard BWR fuel manufactured by General Electric (GE), Exxon/ANF, <i>and Framatome ANP</i> . The NUHOMS [®] -24P and 52B systems are limited for use to these standard designs and to <i>reload</i> designs by other manufacturers as listed in Chapter 3 of the FSAR. The analyses presented in the FSAR are based on non-consolidated, zircaloy-clad fuel with no known or suspected gross breaches.

The physical parameters that define the mechanical and structural design of the HSM and DSC are the fuel assembly dimensions and weight. The calculated stresses given in the FSAR are based on the physical parameters given in Tables 1-1a, 1-1b, 1-1c, 1-1d, 1-1e, 1-1f, 1-1g, 1-1i, 1-1j, 1-1l, 1-1m, *1-1t*, *1-1u*, *1-1aa and 1-1bb* which represent the upper bound.

The design basis fuel assemblies for nuclear criticality safety are Babcock and Wilcox 15x15 fuel assemblies for the NUHOMS[®]-24P and 24PHB, General Electric 7x7 fuel assemblies for the NUHOMS[®]-52B and General Electric 10x10 fuel assemblies for the NUHOMS[®]-61BT and *61BTH* designs. The nuclear criticality safety for the NUHOMS[®]-32PT, NUHOMS[®]-24PTH *and NUHOMS[®] 32PTH1* designs is based on an evaluation of individual fuel assembly class as listed in Table 1-1e, Table 1-11 *and Table 1-1aa*, respectively.

The NUHOMS[®]-24P Long Cavity DSC is designed for use with standard Burnable Poison Rod Assembly (BPRA) designs for the B&W 15x15 and Westinghouse 17x17 fuel types as listed in Appendix J of the FSAR. The NUHOMS[®]-24PHB Long Cavity DSC is designed for use with standard BPRA designs for the B&W 15x15 fuel types listed in Appendix N of the FSAR.

The design basis PWR BPRA for shielding source terms and thermal decay heat load is the Westinghouse 17x17 Pyrex Burnable Absorber, while the DSC internal pressure analysis is limited by B&W 15x15 BPRAs. In addition, BPRAs with cladding failures were determined to be acceptable for loading into NUHOMS[®]-24P Long Cavity DSC as evaluated in Appendix J of the FSAR. The acceptability of loading BPRAs, including damaged BPRAs into the long cavity versions of the 32PT and 24PTH DSC configurations is provided in Appendix M and Appendix P respectively of the FSAR.

Control Components (CCs), as listed in Table 1-1e, Table 1-1l and Table 1-1aa are authorized for storage in the NUHOMS[®]-32PT DSC, NUHOMS[®]-24PTH DSC and NUHOMS[®]-32PTH1 DSCs, respectively. For these DSCs, BPRAs are considered as being representative of all CCs, unless specifically excluded. The acceptability of loading CCs into the NUHOMS[®]-32PT, NUHOMS[®]-24PTH and NUHOMS[®]-32PTH1 DSCs is provided in Appendix M, P and U of the FSAR, respectively.

The NUHOMS[®]-24P is designed for unirradiated fuel with an initial fuel enrichment of up to 4.0 wt. % U-235, taking credit for soluble boron in the DSC cavity water during loading operations. Section 1.2.15 defines the requirements for boron concentration in the DSC cavity water for the NUHOMS[®]-24P design only. In addition, the fuel assemblies qualified for storage in NUHOMS[®]-24P DSC have an equivalent unirradiated enrichment of less than or equal to 1.45 wt. % U-235. Figure 1-1 defines

the required burnup as a function of initial enrichment. The NUHOMS[®]-52B is designed for unirradiated fuel with an initial enrichment of less than or equal to 4.0 wt. % U-235.

The NUHOMS[®]-61BT has three basket configurations, based on the boron content in the poison plates as listed in Table 1-1k. The maximum lattice average enrichment authorized for Type A, B and C NUHOMS[®]-61BT DSC is 3.7, 4.1 and 4.4 wt. % U-235 respectively.

The NUHOMS[®]-61BTH DSC is designed for unirradiated fuel with a maximum lattice average enrichment of 5.0 wt. % U-235 as shown in Table 1-1t, taking credit for the boron content in the poison plates of the DSC basket, as shown in Table 1-1v for intact fuel and Table 1-1w for damaged fuel. The NUHOMS[®]-61BTH DSC (similar to 61BT DSC) is designated as Type 1 and Type 2 depending upon the rails used in the basket.

Each 61BTH DSC type is provided with six alternate basket configurations, based on the boron content in the poison plates, as listed in Table 1-1v or Table 1-1w (designated as "A" for the lowest B10 loading to "F" for the highest B10 loading). Three alternate poison materials are allowed: (a) Borated Aluminum alloy, or (b) a Boron Carbide/Aluminum Metal Matrix Composite (MMC), or (c) Boral[®].

For the 61BTH DSC, Borated Aluminum, MMC, or Boral[®] shall be supplied in accordance with UFSAR Sections T.9.1.7.1, T.9.1.7.2, T.9.1.7.3, T.9.1.7.5, T.9.1.7.6.5, and T.9.1.7.7.3, with the minimum B10 areal density specified in Table 1-1v or Table 1-1w. These sections of the FSAR are hereby incorporated into the NUHOMS[®] 1004 CoC.

The NUHOMS[®]-32PT is designed for unirradiated fuel with an initial fuel enrichment of up to 5.0 wt. % U-235 as shown in Table 1-1g, taking credit for Poison Rod Assemblies (PRAs), poison plates, and soluble boron in the DSC cavity water during loading operations. The required PRA locations are per Figures 1-5, or 1-6 or 1-7. A 32PT DSC basket may contain 0, 4, 8 or 16 PRAs and is designated a Type A, Type B, Type C or Type D basket, respectively. Each basket type is designed with up to three alternate configurations depending on the configuration of poison plates provided (16, 20 or 24) as shown in Table 1-1g. Table 1-1h specifies the minimum B10 content for poison plates. Specification 1.2.15a defines the requirements for boron concentration in the DSC cavity water for the NUHOMS[®]-32PT design only.

The NUHOMS[®]-24PHB is designed for unirradiated fuel with an assembly average initial enrichment of less than or equal to 4.5 wt. % U-235 as shown in Table 1-1i, taking credit for soluble boron in the DSC cavity water during loading operations. Specification 1.2.15b defines the

requirements for boron concentration in the DSC cavity water for the NUHOMS[®]-24PHB design only.

The NUHOMS[®]-24PTH is designed for unirradiated fuel with an assembly average initial enrichment of less than or equal to 5.0 wt. % U-235, as shown in Table 1-11, taking credit for soluble boron in the DSC cavity water during loading operations and the boron content in the poison plates of the DSC basket, as shown in Table 1-1p for intact fuel and Table 1-1q for damaged fuel. The 24PTH DSC basket is designated as Type 1, if it is provided with aluminum inserts and Type 2 if it does not contain the aluminum inserts. Each basket type is designed with three alternate configurations, based on the boron content in the poison plates, as listed in Table 1-1r. The specification for the Metal Matrix Composite (MMC) for the 24PTH poison plates is provided in Table 1-1s. Specification 1.2.15c defines the requirements for boron concentration in the DSC cavity water as a function of the DSC basket type for the various fuel classes authorized for storage in the 24PTH DSC for the NUHOMS[®]-24PTH design only.

The NUHOMS[®]-32PTH1 is designed for unirradiated fuel with an assembly average initial enrichment of less than or equal to 5.0 wt. % U-235, as shown in Table 1-1aa, taking credit for soluble boron in the DSC cavity water during loading operations and the boron content in the poison plates of the DSC basket, as shown in Table 1-1cc for intact fuel and Table 1-1dd for damaged fuel. The 32PTH1 DSC basket is designated as Type 1 or Type 2, depending upon the rails used in the basket. Each basket type is designed with five alternate configurations, based on the boron content in the poison plates, as listed in Table 1-1ff. Specification 1.2.15d defines the requirements for boron concentration in the DSC cavity water as a function of the DSC basket type for the various fuel classes authorized for storage in the 32PTH1 DSC for the NUHOMS[®]-32PTH1 design only.

For the 32PTH1 DSC, Borated Aluminum, MMC, or Boral[®] shall be supplied in accordance with UFSAR Sections U.9.1.7.1, U.9.1.7.2, U.9.1.7.3, U.9.1.7.5, U.9.1.7.6.5, and U.9.1.7.7.3, with the minimum B10 areal density specified in Table 1-1ff. These sections of the FSAR are hereby incorporated into the NUHOMS[®] 1004 CoC.

The thermal design criterion of the fuel to be stored is that the total maximum heat generation rate per assembly and BPRA or Control Components be such that the fuel cladding temperature is maintained within established limits during normal and off-normal conditions. For the NUHOMS[®]-24P, 52B and 61BT systems, fuel cladding temperature limits were established based on methodology in PNL-6189 and PNL-4835. For the NUHOMS[®]-32PT, 24PHB and 24PTH systems, fuel cladding limits are based on ISG-11, Rev. 2 (Reference 3). *For the NUHOMS[®]-61BTH system*, NUHOMS[®]-61BT system with Framatome-

ANP 9x9 Version 9x9-2 (FANP9 9x9-2) fuel assemblies, *and the NUHOMS*[®]-*32PTH1 system*, fuel cladding limits are based on ISG-11, Rev. 3 (Reference 4).

The radiological design criterion is that fuel stored in the NUHOMS[®] system must not increase the average calculated HSM or transfer cask surface dose rates beyond those calculated for the 24P, 24PHB, 52B, 61BT, or 32PT canister full of design basis fuel assemblies with or without BPRAs. The design value average HSM and cask surface dose rates for the 24P and 52B canisters were calculated to be 48.6 mrem/hr and 591.8 mrem/hr respectively based on storing twenty four (24) Babcock and Wilcox 15x15 PWR assemblies (without BPRAs) with 4.0 wt. % U-235 initial enrichment, irradiated to 40,000 MWd/MTU, and having a post irradiation time of five years. To account for BPRAs, the fuel assembly cooling required times are increased to maintain the above dose rate limits.

Title or Parameter	Specifications
Fuel	Only intact, unconsolidated PWR fuel assemblies (with or without BPRAs) with the following requirements.
Physical Parameters (without BPRAs)	
Maximum Assembly Length (unirradiated)	165.75 in (standard cavity) 171.71 in (long cavity)
Nominal Cross-Sectional Envelope	8.536 in
Maximum Assembly Weight	1682 lbs
No. of Assemblies per DSC	\leq 24 intact assemblies
Fuel Cladding	Zircalloy-clad fuel with no known or suspected gross cladding breaches
Physical Parameters (with BPRAs)	
Maximum Assembly + BPRA Length (unirradiated)	
With Burnup > 32,000 and \leq 45,000 MWd/MTU	171.71 in (long cavity)
With Burnup ≤ 32,000 MWd/MTU	171.96 in (long cavity)
Nominal Cross-Sectional Envelope	8.536 in
Maximum Assembly + BPRA Weight	1682 lbs
No. of Assemblies per DSC	\leq 24 intact assemblies
No. of BPRAs per DSC	≤ 24 BPRAs
Fuel Cladding	Zircalloy-clad fuel with no known or suspected gross cladding breaches
Nuclear Parameters	
Fuel Initial Enrichment	≤ 4.0 wt. % U-235
Fuel Burnup and Cooling Time	Per Table 1-2a (without BPRAs) or Per Table 1-2c (with BPRAs)
BPRA Cooling Time (Minimum)	5 years for B&W Designs 10 years for Westinghouse Designs
Alternate Nuclear Parameters	
Initial Enrichment	≤ 4.0 wt. % U-235
Burnup	≤ 40,000 MWd/MTU
Decay Heat (Fuel + BPRA)	≤ 1.0 kW per assembly
Neutron Fuel Source	$\leq 2.23 \times 10^8$ n/sec per assy with spectrum bounded by that in Chapter 7 of FSAR
Gamma (Fuel + BPRA) Source	\leq 7.45 x 10 ¹⁵ g/sec per assy with spectrum bounded by that in Chapter 7 of FSAR

Table 1-1aPWR Fuel Specifications for Fuel to be Stored in the
Standardized NUHOMS[®]-24P DSC

Title or Parameter	Specifications
Fuel	Only intact, unconsolidated BWR fuel assemblies with the following requirements
Physical Parameters	
Maximum Assembly Length (unirradiated)	176.16 in
Nominal Cross-Sectional Envelope*	5.454 in
Maximum Assembly Weight	725 lbs
No. of Assemblies per DSC	\leq 52 intact channeled assemblies
Fuel Cladding	Zircalloy-clad fuel with no known or suspected gross cladding breaches
Nuclear Parameters	
Fuel Initial Lattice Enrichment	≤ 4.0 wt. % U-235
Fuel Burnup and Cooling Time	Per Table 1-2b
Alternate Nuclear Parameters	
Initial Enrichment	≤ 4.0 wt. % U-235
Burnup	≤ 35,000 MWd/MTU and per Figure 1.1
Decay Heat	≤ 0.37 kW per assembly
Neutron Source	$\leq 1.01 \times 10^8$ n/sec per assy with spectrum bounded by that in Chapter 7 of FSAR
Gamma Source	\leq 2.63 x 10 ¹⁵ g/sec per assy with spectrum bounded by that in Chapter 7 of FSAR

Table 1-1bBWR Fuel Specifications for Fuel to be Stored in the
Standardized NUHOMS[®]-52B DSC

*Cross-Sectional Envelope is the outside dimension of the fuel channel.

Physical Parameters	
Fuel Design	7x7, 8x8, 9x9, or 10x10 BWR fuel assemblies manufactured by General Electric or equivalent reload fuel that are enveloped by the fuel assembly design characteristics listed in Table 1-1d.
Cladding Material	Zircaloy
Fuel Damage	Cladding damage in excess of pinhole leaks or hairline cracks is not authorized to be stored as "Intact BWR Fuel."
Channels	Fuel may be stored with or without fuel channels
Maximum Assembly Length	176.2 in
Nominal Assembly Width (excluding channels)	5.44 in ·
Maximum Assembly Weight	705 lbs
Radiological Parameters: No interpolation of Radiologi	cal Parameters is permitted between Groups.
Group 1	
Maximum Burnup	27,000 MWd/MTU
Minimum Cooling Time	5-years
Maximum Lattice Average Initial Enrichment	See Minimum Boron Loading below.
Minimum Initial Bundle Average Enrichment	2.0 wt. % U-235
Maximum Initial Uranium Content	198 kg/assembly
Maximum Decay Heat	300 W/assembly ⁽¹⁾
Group 2	
Maximum Burnup	35,000 MWd/MTU
Minimum Cooling Time	8-years
Maximum Lattice Average Initial Enrichment	See Minimum Boron Loading below.
Minimum Initial Bundle Average Enrichment	2.65 wt. % U-235
Maximum Initial Uranium Content	198 kg/assembly
Maximum Decay Heat	300 W/assembly ⁽¹⁾
Group 3	
Maximum Burnup	37,200 MWd/MTU
Minimum Cooling Time	6.5-years
Maximum Lattice Average Initial Enrichment	See Minimum Boron Loading below.
Minimum Initial Bundle Average Enrichment	3 38 wt %11-235
Maximum Initial Uranium Content	198 kg/assembly
Maximum Deeny Heat	$300 \text{ W/assembly}^{(1)}$
Crown A	500 W/assembly
Maximum Burnup	40,000 MWd/MTU
Minimum Cooling Time	10-years
Maximum Lattice Average Initial Enrichment	See Minimum Boron Loading below.
Minimum Initial Bundle Average Enrichment	3.4 wt. % U-235
Maximum Initial Uranium Content	198 kg/assembly
Maximum Decay Heat	300 W/assembly ⁽¹⁾
Minimum Boron Loading	
Lattice Average Enrichment (wt. % U-235)	Minimum B-10 Content in Poison Plates
<u>44</u>	Type C Basket
<u> </u>	Type B Basket
3.7	Type & Basket
J./	1 ype A Dasket
Anernate Radiological rarameters:	Cas Minimum Darian Landing Alterna
	See Minimum Boron Loading Above
Enrichment, and Cooling Time:	See Table 1-2q
Maximum Initial Uranium Content:	198 kg/assembly
Maximum Decay Heat:	300 W/assembly ⁽¹⁾

Table 1-1cBWR Fuel Specifications for Fuel to be Stored in the
Standardized NUHOMS[®]-61BT DSC

(1) For FANP9 9x9-2 fuel assemblies, the maximum decay heat is limited to 0.21 kW/assembly

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Table 1-1dBWR Fuel Assembly Design Characteristics (1) (2)for the NUHOMS[®]-61BT DSC

Transnuclear, ID	7x7- 49/0 ⁽⁵⁾	8x8- 63/1 ⁽⁵⁾	8x8- 62/2 ⁽⁵⁾	8x8- 60/4 ⁽⁵⁾	8x8- 60/1 ⁽⁵⁾	9x9- 74/2	10x10- 92/2	7x7- 49/0 ⁽⁵⁾	7x7- 48/1Z ⁽⁵⁾	8x8- 60/4Z ⁽⁵⁾	9x9- 79/2
GE Designations	GE1 GE2 GE3	GE4	GE-5 GE-Pres GE-Barrier GE8 Type I	GE8 Type II	GE9 GE10	GE11 GE13	GE12	ENC III-A	ENC III ⁽³⁾	ENC Va & ENC Vb	FANP9 9x9-2
Max Length (in) (Unirradiated)	176.2	176.2	176.2	176.2	176.2	176.2	176.2	176.2	176.2	176.2	176.2
Nominal Width (in) (excluding channels)	5.44	5.44	5.44	5.44	5.44	5.44	5.44	5.44	5.44	· 5.44	5.44
Fissile Material	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂
Number of Fuel Rods	49	63	62	60	60	66 – Full 8 – Partial	78 – Full 14 – Partial	49	48	60	79
Number of Water Holes	0	1	2	4	1	2	2	0	1 ⁽⁴⁾	4 ⁽⁴⁾	2

(1) Any fuel channel thickness from 0.065 to 0.120 inch is acceptable on any of the fuel designs.

(2) Maximum fuel assembly weight with channel is 705 lb.

(3) Includes ENC III-E and ENC III-F.

(4) Solid Zirc rods instead of water holes.

(5) May be stored as damaged fuel.

Table 1-1ePWR Fuel Specifications for Fuel to be Stored in the NUHOMS®-32PT DSC

PHYSICAL PARAMETERS:	
Fuel Assembly Class	Only intact (including reconstituted) B&W 15x15, WE 17x17, CE 15x15, WE 15x15, CE 14x14 and WE 14x14 class PWR assemblies or equivalent reload fuel manufactured by other vendors that are enveloped by the fuel assembly design characteristics listed in Table 1-1f.
Reconstituted Fuel Assemblies	\leq 32 assemblies per DSC with up to 56 stainless steel rods per assembly or unlimited number of lower enrichment UO ₂ rods per assembly.
Fuel Cladding Material	Zircaloy
Fuel Damage	Cladding damage in excess of pinhole leaks or hairline cracks is not authorized to be stored as "Intact PWR Fuel."
Control Components (CCs)	 Up to 32 CCs are authorized for storage with all fuel assemblies except CE 15x15 class assemblies. Authorized CCs include Burnable Poison Rod Assemblies (BPRAs), Thimble Plug Assemblies (TPAs), Control Rod Assemblies (CRAs), Rod Cluster Control Assemblies (RCCAs), Axial Power Shaping Rod Assembly (APSRAs), Orifice Rod Assemblies (ORAs), Vibration Suppression Inserts (VSIs), Neutron Source Assemblies (NSAs) and Neutron Sources. Design basis thermal and radiological characteristics for the CCs are listed in Table 1-1ee.
Maximum Assembly plus CC Weight	-1365 lbs for 32PT-S100 & 32PT-L100 System -1682 lbs for 32PT-S125 & 32PT-L125 System
CC Damage	CCs with cladding failures are acceptable for loading.
THERMAL/RADIOLOGICAL PARAMETERS:	
Fuel Burnup and Cooling Time without CCs ¹	Per Table 1-2d, Table 1-2e, Table 1-2f, Table 1-2g, Table 1-2h, and Figure 1-2 or Figure 1-3 or Figure 1-4.
Fuel Burnup and Cooling Time with CCs^{l}	Per Table 1-2i, Table 1-2j, Table 1-2k, Table 1-2l, Table 1-2m and Figure 1-2 or Figure 1-3 or Figure 1-4.
Initial Enrichment	Per Table 1-1g and Figure 1-5 or Figure 1-6 or Figure 1-7.

¹ BPRAs are considered as being representative of all CCs.

Table 1-1f

Assembly Class	B&W 15x15	WE 17x17	CE 15x15 ^{(3), (4)}	WE 15x15	CE 14x14	WE 14x14
DSC Configuration		N	lax Unirradia	ted Length (i	n)	
32PT-S100/32PT-S125	165.75 ⁽¹⁾	165.75 ⁽¹⁾	165.75	165.75 ⁽¹⁾	165.75 ⁽¹⁾	165.75 ⁽¹⁾
32PT-L100/32PT-L125	171.71 ⁽¹⁾	171.71 ⁽¹⁾	171.71	171.71 ⁽¹⁾	171.71 ⁽¹⁾	171.71 ⁽¹⁾
Fissile Material	UO ₂	UO2	UO ₂	UO ₂	UO ₂	UO ₂
Maximum MTU/assembly ⁽²⁾	0.475	0.475	0.475	0.475	0.475	0.475
Maximum Number of Fuel Rods	208	264	216	204	176	179
Maximum Number of Guide/ Instrument Tubes	17	25	9	21	5	17

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PWR Fuel Assembly Design Characteristics for the NUHOMS®-32PT DSC

(1)

Maximum Assembly + CC Length (unirradiated) The maximum MTU/assembly is based on the shielding analysis. The listed value is higher than the actual. CE 15x15 assemblies with stainless steel plugging clusters installed are acceptable. Control Components are not authorized for storage with CE 15x15 class assemblies. (2)

(3) (4)

Table 1-1g

Initial Enrichment and Required Number of PRAs and Minimum Soluble Boron Loading
(NUHOMS [®] -32PT DSC)

	Soluble	N (lo PRA Type A	s)	4 PRAs (Type B)		8 PRAs (Type C)		16 PRAs (Type D)	
Assembly Class	Loading (ppm)	Poison Plate Configuration		Poison Plate Configuration		Poison Plate Configuration		Poison Plate Configuration		
	(F F)	16	20	24	20	24	20	24	20	24
WE 17x17 Fuel Assembly ⁽¹⁾	2500	3.40	3.40	3.40	4.00	4.00	4.50	4.50	5.00	5.00
B&W 15x15 Mark B Fuel Assembly ⁽¹⁾	2500	3.30	3.30	3.30	3.90	3.90	NE	NE	5.00	5.00
WE 15x15 Fuel Assembly (without CC)	2500	3.40	3.40	3.40	4.00	4.00	4.60	4.60	5.00	5.00
WE 15x15 Fuel Assembly (with CC)	2500	3.40	3.35	3.40	4.00	4.00	4.55	4.55	5.00	5.00
-	1800	3.35	NE	3.50	NE	4.00	NE	4.35	NE	NE
	2000	3.50	NE	3.70	NE	4.20	NE	4.55	NE	NE
	2100	3.60	NE	3.80	NE	4.30	NE	4.70	NE	NE
CE 14x14 Fuel Assembly (without CC)	2200	3.70	NE	3.90	NE	4.40	NE	4.80	NE	NE
	2300	3.75	NE	4.00	NE	4.50	NE	4.90	NE	NE
	2400	3.80	NE	4.05	NE	4.60	NE	5.00	NE	NE
	2500	3.90	3.80	4.15	4.60	4.70			NE .	NE
	1800	3.30	NE	3.45	NE	3.90	NE	4.25	NE	NE
	2000	3.45	NE	3.65	NE	4.10	NE	4.50	NE	NE
	2100	3.55	NE	3.75	NE	4.20	NE	4.60	NE	NE
CE 14x14 Fuel Assembly (with CC)	2200	3.60	NE	3.80	NE	4.30	NE	4.70	NE	NE
	2300	3.65	NE	3.90	NE	4.40	NE	4.80	NE	NE
	2400	3.80	NE	4.00	NE	4.50	NE	4.90	NE	NE
	2500	3.90	3.70	4.05	4.45	4.60	4.95	5.00	NE	NE
	1800	3.55	NE	3.75	NE	4.40	NE	NE	NE	NE
	2000	3.75	NE	3.90	NE	4.60	NE	NE	NE	NE
WE 14,14 Evel Accombly	2100	3.80	NE	4.00	NE	4.75	NE	NE	NE	NE
(with and without CC)	2200	3.90	NE	4.10	NE	4.85	NE	NE	NE	NE
	2300	4.00	NE	4.20	NE	5.00	NE	NE	NE	NE
	2400	4.10	NE	4.30	NE		NE	NE	NE	NE
	2500	4.15	4.00	4.40	5.00		NE	NE	NE	NE
	1800	3.00	NE	3.15	NE	NE	NE	NE	NE	NE
	2000	3.15	NE	3.30	NE	NE	NE	NE	NE	NE
	2100	3.20	NE	3.40	NE	NE	NE	NE	NE	NE
CE 15x15 Fuel Assembly	2200	3.30	NE	3.50	NE	NE	NE	NE	NE	NE
	2300	3.35	NE	3.55	NE	NE	NE	NE	NE	NE
· ·	2400	3.40	NE	3.60	NE	NE	NE	NE	NE	NE
	2500	3.50	3.40	3.70	NE	NE	NE	NE	NE	NE

NOTES:
(1) With or without CCs. CCs shall not be stored in basket location where a PRA is required. NE = Not Evaluated

Table 1-1hB10 Content Specification for Poison Plates (NUHOMS®-32PT DSC)

DSC Configuration	Poison Plate Specification
32PT-S100 or 32PT-S125 or 32PT-L100 or 32PT-L125	Minimum B10 areal density = 0.007 gm/cm^2

Title or Parameter	Specifications
Fuel	Only intact, unconsolidated B&W 15x15 (with or without BPRAs), WE 17x17, WE 15x15, CE 14x14, and WE 14x14 (all without BPRAs) Class PWR fuel assemblies or equivalent reload fuel manufactured by other vendor, with the following requirements
Maximum No. of Reconstituted Assemblies per DSC with Stainless Steel rods	4
Maximum No. of Stainless Steel Rods per Reconstituted Assembly	10
Maximum No. of Reconstituted Assemblies per DSC with low enriched uranium oxide rods	24
Physical Parameters (without BPRAs) Maximum Assembly Length (unirradiated)	165.785 in (standard cavity) 171.96 in (long cavity)
Nominal Cross-Sectional Envelope Maximum Assembly Weight	8.536 in 1682 lbs
No. of Assemblies per DSC Fuel Cladding	≤ 24 intact assemblies Zircaloy-clad fuel with no known or suspected gross cladding breaches
Physical Parameters (with BPRAs) Maximum Assembly + BPRA Length (unirradiated) Nominal Cross-Sectional Envelope Maximum Assembly + BPRA Weight No. of Assemblies per DSC No. of BPRAs per DSC Fuel Cladding	 171.96 in (long cavity) 8.536 in 1682 lbs ≤ 24 intact assemblies ≤ 24 BPRAs Zircaloy-clad fuel with no known or suspected gross cladding breaches
Nuclear Parameters Maximum Fuel Initial Enrichment Maximum Initial Uranium loading per assembly Allowable loading configurations for each 24PHB DSC	4.5 wt. % U-235 0.490 MTU As specified in Figure 1-8 or 1-9
Burnup, Enrichment, and Minimum Cooling Time for Configuration 1 (Figure 1-8) Burnup, Enrichment, and Minimum Cooling Time for Configuration 2 (Figure 1-9)	Table 1-2n for Zone 1 fuel; Table 1-2o for Zone 2 fuel; Table 1-2p for Zone 3 fuel Table 1-2p for Zone 3 fuel
Minimum Cooling Time for BPRAs Total Decay Heat per DSC Decay Heat Limits for Zone 1, 2 and 3 fuel	5 years 24 kW As specified in Figures 1-8 and 1-9.

Table 1-1iPWR Fuel Specification for Fuel to be Stored in the
Standardized NUHOMS[®]-24PHB DSC

Table 1-1jBWR Fuel Specification of Damaged Fuel to be Stored in the StandardizedNUHOMS[®]-61BT DSC

PHYSICAL PARAMETERS:	
Fuel Design:	7x7, 8x8 BWR damaged fuel assemblies manufactured by General Electric or Exxon/ANF or equivalent reload fuel that are enveloped by the Fuel assembly design characteristics listed in Table 1-1d for the 7x7 and 8x8 designs only.
Cladding Material:	Zircaloy
Fuel Damage:	Damaged BWR fuel assemblies are fuel assemblies containing fuel rods with known or suspected cladding defects greater than hairline cracks or pinhole leaks. Missing cladding and/or crack size in the fuel pins is to be limited such that a fuel pellet is not able to pass through the gap created by the cladding opening during handling and retrievability is assured following Normal/Off-Normal conditions. Damaged fuel shall be stored with Top and Bottom Caps for Failed Fuel. Damaged fuel may only be stored in the 2x2 compartments of the "Type C" NUHOMS [®] -61BT Canister.
Channels:	Fuel may be stored with or without fuel channels.
Maximum Assembly Length (unirradiated)	176.2 in
Nominal Assembly Width (excluding channels)	5.44 in
Maximum Assembly Weight	705 lbs
RADIOLOGICAL PARAMETERS:	No interpolation of Radiological Parameters is permitted between groups.
Group 1:	
Maximum Burnup:	27,000 MWd/MTU
Minimum Cooling Time:	5-years
Maximum Initial Lattice Average Enrichment:	4.0 wt. % U-235
Maximum Pellet Enrichment:	4.4 wt. % U-235
Minimum Initial Bundle Average Enrichment:	2.0 wt. % U-235
Maximum Initial Uranium Content:	198 kg/assembly
Maximum Decay Heat:	300 W/assembly
Group 2:	
Maximum Burnup:	35,000 MWd/MTU
Minimum Cooling Time:	8-years
Maximum Initial Lattice Average Enrichment:	4.0 wt. % U-235
Maximum Pellet Enrichment:	4.4 wt. % U-235
Minimum Initial Bundle Average Enrichment:	2.65 wt. % U-235
Maximum Initial Uranium Content:	198 kg/assembly
Maximum Decay Heat:	300 W/assembly
Group 3:	
Maximum Burnup:	37,200 MWd/MTU
Minimum Cooling Time:	6.5-years
Maximum Initial Lattice Average Enrichment:	4.0 wt. % U-235
Maximum Pellet Enrichment:	4.4 wt. % U-235
Minimum Initial Bundle Average Enrichment:	3.38 wt. % U-235
Maximum Initial Uranium Content:	198 kg/assembly
Maximum Decay Heat:	300 W/assembly

A-20

Table 1-1jBWR Fuel Specification of Damaged Fuel to be Stored in the StandardizedNUHOMS[®]-61BT DSC

RADIOLOGICAL PARAMETERS:	
Group 4:	
Maximum Burnup:	40,000 MWd/MTU .
Minimum Cooling Time:	10-years
Maximum Initial Lattice Average Enrichment:	4.0 wt. % U-235
Maximum Pellet Enrichment:	4.4 wt. % U-235
Minimum Initial Bundle Average Enrichment:	3.4 wt. % U-235
Maximum Initial Uranium Content:	198 kg/assembly
Maximum Decay Heat:	300 W/assembly
ALTERNATE RADIOLOGICAL PARAMETERS:	
Maximum Initial Lattice Average Enrichment:	4.0 wt. % U-235
Fuel Burnup, Initial Bundle Average Enrichment, and Cooling Time:	See Table 1-2q
Maximum Pellet Enrichment:	4.4 wt. % U-235
Maximum Initial Uranium Content:	198 kg/assembly
Maximum Decay Heat:	300 W/assembly

(Concluded)

MULIOMS [®] (1PT DSC Packat	Minimum B10 <i>Areal</i> Density, gm/cm ²				
Туре	Enriched Boron Aluminum Alloy or Boralyn ^{®(1)}	Boral [®] or Metamic ^{®(2)}			
Ä	.021	.025			
В	.032	.038			
С	.040	.048			

Table 1-1kB10 Specification for the NUHOMS[®]-61BT Poison Plates

Note 1: An alternate metal matrix composite with properties equivalent to Boralyn[®] is acceptable. Note 2: An alternate metal matrix composite with properties equivalent to Metamic[®] is acceptable.

PHYSICAL PARAMETERS:	
Fuel Class	Intact or damaged unconsolidated B&W 15x15, WE 17x17,
	CE 15x15, WE 15x15, CE 14x14 and WE 14x14 class PWR
	assemblies (with or without control components) that are
	enveloped by the fuel assembly design characteristics listed in
	Table 1-1m. Equivalent reload fuel manufactured by other
	vendors but enveloped by the design characteristics listed in
	Table 1-1m is also acceptable.
	Damaged PWR fuel assemblies are assemblies containing
	missing or partial fuel rods or fuel rods with known or
	suspected cladding defects greater than hairline cracks or
Fuel Damage	pinhole leaks. The extent of cladding damage in the fuel rods
	is to be limited such that a fuel pellet is not able to pass
· · ·	through the damaged cladding opening during handling and
	conditions
Partial Levisth Shield Assemblies (PLSAs)	WE 15x15 class PISAs with following characteristics are
I artial Length Shield Assemblies (I LSAS)	authorized.
	Maximum hurmup 40 GWd/MTU
· ·	Minimum cooling time 65 years
	Maximum decay heat 900 watts
Reconstituted Fuel Assemblies	- Maximum doody noat, 500 watts
Maximum No. of Reconstituted Assemblies	4
per DSC with <i>Irradiated</i> Stainless Steel Rods	
Maximum No. of <i>Irradiated</i> Stainless Steel	10
Rods per Reconstituted Fuel Assembly	
Maximum No. of Reconstituted Assemblies	24
per DSC with unlimited number of low	24
enriched UO ₂ rods and/or Unirradiated	
Stainless Steel Rods and/or Zr Rods or Zr	
Pellets	
	• Up to 24 CCs are authorized for storage in 24PTH-L and
	24PTH-S-LC DSCs only.
	Authorized CCs include Burnable Poison Rod
	Assemblies (BPKAS), Thimble Plug Assemblies (TPAS),
Control Components (CCs)	Control Kod Assemblies (UKAS), Kod Cluster Control
Control Components (CCs)	Rode (APSRAs) Orifice Rod Assemblies (OPAs)
	Vibration Suppression Inserts (VSIs) Neutron Source
	Assemblies (NSAs) and Neutron Sources
	Design basis thermal and radiological characteristics for
	the CCs are listed in Table 1-1n.
Nominal Assembly Width	8.536 inches
No. of Intact Assemblies	≤24
	Maximum of 12 damaged fuel assemblies. Balance may be
	intact fuel assemblies, empty slots, or dummy assemblies
	depending on the specific heat load zoning configuration.
No. and Location of Damaged Assemblies	
The and Elecation of Damaged Assemblies	Damaged fuel assemblies are to be placed in Location A
	and/or B as shown in Figure 1-16. The DSC basket cells
	which store damaged fuel assemblies are provided with top
	and bottom end caps to assure retrievability.
Maximum Assembly plus CC Weight	1682 lbs

 Table 1-11

 PWR Fuel Specification for the Fuel to be Stored in the NUHOMS[®]-24PTH DSC

Table 1-11

PWR Fuel Specification for the Fuel to be Stored in the NUHOMS[®]-24PTH DSC

(Con	clud	led)
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THERMAL/RADIOLOGICAL PARAMETERS: Allowable Heat Load Zoning Configurations for each 24PTH DSC	Per Figure 1-11 or Figure 1-12 or Figure 1-13 or Figure 1-14 or Figure 1-15.
Burnup, Enrichment, and Minimum Cooling Time for	Per Table 1-3a for Zone 1 fuel.
Burnup, Enrichment, and Minimum Cooling Time for Configuration 2 (Without CCs)	Per Table 1-3b for Zone 2 fuel.
Burnup, Enrichment, and Minimum Cooling Time for Configuration 3 (Without CCs)	Per Table 1-3b for Zone 2 fuel and Table 1-3c for Zone 3 fuel
Burnup, Enrichment, and Minimum Cooling Time for Configuration 4 (Without CCs)	Per Table 1-3d for Zone 4 fuel.
Burnup, Enrichment, and Minimum Cooling Time for Configuration 5 (Without CCs)	Per Table 1-3c for Zone 3 fuel and Table 1-3d for Zone 4 fuel.
Burnup, Enrichment, and Minimum Cooling Time for	Per Table 1-3e for Zone 1 fuel.
Burnup, Enrichment, and Minimum Cooling Time for Configuration 2 (With CCs)	Per Table 1-3f for Zone 2 fuel.
Burnup, Enrichment, and Minimum Cooling Time for Configuration 3 (With CCs)	Per Table 1-3f for Zone 2 fuel and per Table 1-3g for Zone 3 fuel
Burnup, Enrichment, and Minimum Cooling Time for Configuration 4 (With CCs)	Per Table 1-3h for Zone 4 fuel.
Burnup, Enrichment, and Minimum Cooling Time for Configuration 5 (With CCs)	Per Table 1-3g for Zone 3 fuel and per Table 1-3h for Zone 4 fuel.
Maximum Initial Fuel Enrichment	5.0 wt. % U-235
	Type 1 Basket: \leq 40.8 kW for 24PTH-S and 24PTH-L DSCs with decay heat limits for Zones 1, 2, 3 and 4 as specified in Figure 1-11 or Figure 1-12 or Figure 1-13 or Figure 1-14.
Decay Heat	Type 2 Basket: Same as Type 1 Basket except \leq 31.2 kW/DSC and \leq 1.3 kW/fuel assembly for 24PTH-S and 24PTH-L DSCs. \leq 24.0 kW for 24PTH-S-LC DSC with decay heat limits as specified in Figure 1-15.
Minimum Boron Loading in the Poison Plates	Per Table 1-1r

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Assembly	y Class	B&W 15x15	WE 17x17	CE 15x15	WE 15x15	CE 14x14	WE 14x14
Maximum Unirradiated Length (in) ⁽¹⁾	24PTH-S	165.75	165.75	165.75	165.75	165.75	165.75
	24PTH-L	171.93	171.93	171.93	171.93	171.93	171.93
	24PTH-S- LC	171.93	N/A ⁽³⁾	N/A ⁽³⁾	N/A ⁽³⁾	N/A ⁽³⁾	N/A ⁽³⁾
Fissile Material		UO ₂	UO ₂	UO ₂	UO ₂	. UO ₂	UO ₂
Maximum MTU/Assembly	_/ (2)	0.49	0.49	0.49	0.49 ⁽⁴⁾	0.49	0.49
Maximum Num Rods	iber of Fuel	208	264	216	204	176	179
Maximum Num Guide/ Instrume	iber of ent Tubes	17	25	9	21	5	17

(1)

Maximum Assembly + Control Component Length (unirradiated) The maximum MTU/assembly is based on the shielding analysis. The listed value is higher than the actual. (2)

(3) Not authorized for storage.

The maximum MTU/assembly for WE 15x15 PLSA = 0.33. (4)

Table 1-1nThermal and Radiological Characteristics for Control Components Stored in the
NUHOMS[®] -24PTH DSC

Parameter .	BPRAs, NSAs, CRAs, <i>RCCAs,</i> <i>VSIs, Neutron</i> <i>Sources</i> and APSRAs	TPAs and ORAs	
Maximum Gamma Source (γ/sec/DSC)	9.3E+14	9.8E+13	
Decay Heat (Watts/DSC)	192.0	192.0	

Fuel Assembly Class	Maximum Assembly Average Initial Enrichment (wt. % U-235) as a Function of Soluble Boron Concentration and Basket Type (Fixed Poison Loading)				
Fuel Assembly Class	Minimum	Basket Type			
	Soluble Boron (ppm)	1A or 2A	1B or 2B	1C or 2C	
	2100	4.50	4.90	NR	
	2200	4.60	5.00	[·] NR	
CE $14\times 14^{(1)}$	2300	4.70	NR	NR	
CE 14X14	2400	4.80	NR	NR	
	2500	4.90	NR	NR	
	2600	5.00	NR	NR	
WE 14x14 ⁽²⁾	2100	4.80	5.00	NR	
	2200	4.90	NR	NR	
	2300	5.00	NR	NR	
CE 15x15 ⁽²⁾	2100	3.90	4.20	4.60	
	2200	4.00	4.40	4.70	
	2300	4.10	4.50	4.80	
	2400	4.20	4.60	4.90	
	2500	4.30	4.70	5.00	
	2600	4.40	4.80	NR	
	2700	4.50	4.90	NR	
	2800	4.50	5.00	NR	
	2900	4.60	NR	NR	
	3000	4.70	NR	NR	
WE 15x15 ⁽²⁾	2100	3.80	4.20	4.60	
	2200	3.90	4.30	4.70	
	2300	4.00	4.40	4.80	
	2400	4.10	4.50	4.90	
	2500	4.20	4.60	5.00	
	2600	4.30	4.70	NR	
	2700	4.30	4.80	NR	
	2800	4.40	4.90	NR	
	2900	4.50	5.00	NR	
	3000	4.60	NR	NR	

Table 1-1pMaximum Assembly Average Initial Enrichment v/s Neutron Poison Requirements for the
NUHOMS[®] -24PTH DSC (Intact Fuel)
Table 1-1pMaximum Assembly Average Initial Enrichment v/s Neutron Poison Requirements for the
NUHOMS[®] -24PTH DSC (Intact Fuel)

Fuel Assembly Class	Maximum Assembly Average Initial Enrichment (wt. % U-235) as a Function of Soluble Boron Concentration and Basket Type (Fixed Poison Loading)							
Fuct Assembly Class	Minimum	Basket Type						
	Soluble Boron (ppm)	1A or 2A	1B or 2B	1C or 2C				
WE 17x17 ⁽²⁾	2100	3.80	4.10	4.50				
	2200	3.90	4.20	4.60				
	2300	4.00	4.30	4.70				
2 2 2	2400	4.00	4.40	4.80				
	-2500	4.10	4.50	4.90				
	2600	4.20	4.60	5.00				
	2700	4.30	4.70	NR				
	2800	4.40	4.80	NR				
	2900	4.50	4.90	NR				
	3000	4.60	5.00	NR				
B&W 15x15 ⁽²⁾	2100	3.60	4.00	4.30				
	2200	3.70	4.10	4.50				
	2300	3.80	4.20	4.60				
	2400	3.90	4.30	4.70				
	2500	4.00	4.40	4.80				
	2600	4.10	4.50	4.90				
	2700	4.20	4.60	5.00				
	2800	4.20	4.70	NR				
	2900	4.30	4.80	NR				
	3000	4.40	4.90	NR				

(Concluded)

Notes:

- (1) When CCs that extend into the active fuel region are stored, the maximum assembly average initial enrichment shall be reduced by 0.2 wt. %.
- (2) When CCs that extend into the active fuel region are stored, the maximum assembly average initial enrichment shall be reduced by 0.05 wt. % or the soluble boron concentration shall increased by 50 ppm.

NR = Not Required.

Table 1-1q

Assembly Class	Maximum Number of Damaged Evel	Maximum Assembly Average Initial Enrichme (wt. % U-235) as a Function of Soluble Boror Concentration and Basket Type (Fixed Poison Loading)						
Assembly Class	Assemblies per	Minimum		Basket Type				
	DSC	Soluble Boron (ppm)	1A or 2A	1B or 2B	1C or 2C			
CE 14x14 ⁽¹⁾	8	2150	NR	4.80	NR			
	12	2150	NR	4.70	NR			
	12	2450	4.50	5.00	NR			
WE 14x14 ⁽²⁾	12	2150	4.50	5.00	NR			
CE 15x15 ⁽²⁾	12	2150	NR	NR	4.50			
	12	2550	NR	NR	5.00			
WE 15x15 ⁽²⁾	8	2150	NR	NR	4.50			
	12	2250	NR	NR	4.50			
	8	2550	NR	NR	5.00			
	12	2650	NR	NR	5.00			
B&W 15x15 ⁽²⁾	12	2350	NR	NR	4.50			
	12	2800	NR	NR	5.00			
WE 17x17 ⁽²⁾	12	2250	NR	NR	4.50			
	12	2650	NR	NR	5.00			

Maximum Assembly Average Initial Enrichment v/s Neutron Poison Requirements for the NUHOMS[®] -24PTH DSC (Damaged Fuel)

Notes:

- (1) When CCs that extend into the active fuel region are stored, the maximum assembly average initial enrichment shall be reduced by 0.2 wt. %.
- (2) When CCs that extend into the active fuel region are stored, the maximum assembly average initial enrichment shall be reduced by 0.05 wt. % or the soluble boron concentration shall increased by 50 ppm.

NR = Not Required.

Table 1-1rB10 Specification for the NUHOMS[®]-24PTH Poison Plates

	Minimum B10 Areal Density, gm/cm ²				
NUHOMS [®] -24PTH DSC Basket Type ⁽¹⁾	Natural or Enriched Boron Aluminum Alloy / Metal Matric Composite (MMC)	Boral®			
1A or 2A	.007	.009			
1B or 2B	.015	.019			
1C or 2C	.032	.040			

(1) Basket Type 1 contains aluminum inserts in the R45 transition rails of the basket, Type 2 does not contain aluminum inserts.

Table 1-1s Specification for the Metal Matrix Composite (MMC) for the NUHOMS[®]-24PTH Poison Plates

No.	Specification							
1	The metal matrix composite shall consist of boron carbide powder in an aluminum alloy matrix.							
2	The boron carbide content shall be limited to a maximum 40% by volume.							
3	No more than 10 wt % of the boron carbide powder shall be larger than 60 microns.							
4	The product shall be at least 98% of theoretical density.							
	The composite final product form shall have the tensile properties:							
5	 Minimum yield strength, 0.2% offset: 	1.5 ksi						
	Minimum ultimate strength:	5.0 ksi						
	• Minimum elongation in 2 inches:	1%						

PHYSICAL PARAMETERS: Fuel Class Intact or damaged 7x7, 8x8, 9x9 or 10x10 BWR assemblies manufactured by General Electric or *Exxon/ANF or FANP or reload fuel manufactured by* other vendors that are enveloped by the fuel assembly design characteristics listed in Table 1-1u. Damaged BWR fuel assemblies are assemblies containing fuel rods with known or suspected cladding defects greater than hairline cracks or pinhole leaks. The extent of damage in the fuel assembly is to be Fuel Damage limited such that the fuel assembly will still be able to be handled by normal means and retrievability is assured following normal and off-normal conditions. Missing fuel rods are allowed. **RECONSTITUTED FUEL ASSEMBLIES:** • Maximum No. of Reconstituted Assemblies per DSC 4 with Irradiated Stainless Steel Rods Maximum No. of Irradiated Stainless Steel Rods per 10 Reconstituted Fuel Assembly Maximum No. of Reconstituted Assemblies per DSC 61 with unlimited number of low enriched UO2 rods or Zr Rods or Zr Pellets or Unirradiated Stainless Steel Rods No. of Intact Assemblies ≤61 Up to 16 damaged fuel assemblies, with balance intact or dummy assemblies, are authorized for storage in 61BTH DSC. Damaged fuel assemblies may only be stored in the $2x^2$ No. and Location of Damaged Assemblies compartments as shown in Figure 1-25. The DSC basket cells which store damaged fuel assemblies are provided with top and bottom end caps to assure retrievability. Fuel may be stored with or without channels, channel Channels fasteners, or finger springs 198 kg/assembly Maximum Initial Uranium Content Maximum Assembly Weight with Channels 705 lbs

 Table 1-1t

 BWR Fuel Specification for the Fuel to be Stored in the NUHOMS[®]-61BTH DSC

Table 1-1t BWR Fuel Specification for the Fuel to be Stored in the NUHOMS[®]-61BTH DSC

(Concluded)

<u>THERMAL/RADIOLOGICAL PARAMETERS:</u> Allowable Heat Load Zoning Configurations for each Type 1 61BTH DSC	Per Figure 1-17 or Figure 1-18 or Figure 1-19 or Figure 1-20.
Allowable Heat Load Zoning Configurations for each Type 2 61BTH DSC:	Per Figure 1-17 or Figure 1-18 or Figure 1-19 or Figure 1-20 or Figure 1-21 or Figure 1-22 or Figure 1-23 or Figure 1-24.
Burnup, Enrichment, and Minimum Cooling Time for Heat Load Zoning Configuration 1	Per Table 1-4c for Zone 3 fuel.
Burnup, Enrichment, and Minimum Cooling Time for Heat Load Zoning Configuration 2	Per Table 1-4b for Zone 2 fuel, Table 1-4d for Zone 4 fuel, and Table 1-4e for Zone 5 fuel.
Burnup, Enrichment, and Minimum Cooling Time for Heat Load Zoning Configuration 3	Per Table 1-4b for Zone 2 fuel.
Burnup, Enrichment, and Minimum Cooling Time for Heat Load Zoning Configuration 4	Per Table 1-4a for Zone 1 fuel, Table 1-4b for Zone 2 fuel, Table 1-4d for Zone 4 fuel, and Table 1-4e for Zone 5 fuel.
Burnup, Enrichment, and Minimum Cooling Time for Heat Load Zoning Configuration 5	Per Table 1-4b for Zone 2 fuel and Table 1-4e for Zone 5 fuel.
Burnup, Enrichment, and Minimum Cooling Time for Heat Load Zoning Configuration 6	Per Table 1-4a for Zone 1 fuel, Table 1-4d for Zone 4 fuel, Table 1-4e for Zone 5 fuel, and Table 1-4f for Zone 6 fuel.
Burnup, Enrichment, and Minimum Cooling Time for Heat Load Zoning Configuration 7	Per Table 1-4d for Zone 4 fuel and Table 1-4e for Zone 5 fuel.
Burnup, Enrichment, and Minimum Cooling Time for Heat Load Zoning Configuration 8	Per Table 1-4b for Zone 2 fuel, Table 1-4c for Zone 3 fuel, Table 1-4d for Zone 4 fuel, and Table 1-4e for Zone 5 fuel.
Maximum Initial Lattice Average Enrichment	50 wt % 11-235
Maximum Pellet Enrichment	5.0 wt % U-235
Maximum Decay Heat Limits for Zones 1, 2, 3, 4, 5 and 6 Fuel	Per Figure 1-17 or Figure 1-18 or Figure 1-19 or Figure 1-20 or Figure 1-21 or Figure 1-22 or Figure 1- 23 or Figure 1-24
Decem Host new DSC	$\leq 22.0 kW$ for Type 1 DSC
Decay Heal per DSC	\leq 31.2 kW for Type 2 DSC
Minimum B10 Content in Poison Plates	Per Table 1-1v or Table 1-1w

 Table 1-1u

 BWR Fuel Assembly Design Characteristics⁽¹⁾ for the NUHOMS[®]-61BTH DSC

Transnuclear ID	7x7- 49/0	8x8- 63/1	8x8- 62/2	8x8- 60/4	8.x8- 60/1	9x9- 74/2	10x10- 92/2	7x7- 49/0	7x7- 48/1Z	8x8- 60/4Z	8x8- 62/2	9x9- 79/2	Siemens QFA	10x10- 91/1
Initial Design or Reload Fuel Designation	GE1 GE2 GE3	GE4	GE-5 GE-Pres GE-Barrier GE8 Type I	GE8 Type II	GE9 GE10	GE11 GE13	GE12 GE14	ENC-IIIA	ENC-III ⁽²⁾	ENC Va ENC Vb	FANP 8x8-2	FANP9 9x9-2	9x9	ATRIUM-10
Max Length (in) (Unirradiated)	176.51	176.51	176.51	176.51	176.51	176.51	176.51	176.51	176.51	176.51	176.51	176.2	176.51	176.51
Fissile Material	UO2	UO2	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂	UO2	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂
Maximum No. of Fuel Rods	49	63	62	60	60	74	92	49	48	60	62	79 [:]	72	91

Any fuel channel thickness from 0.065 to 0.120 inch is acceptable on any of the fuel designs. Includes ENC-IIIE and ENC-IIIF. (1)

(2)

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Table 1-1vBWR Fuel Assembly Lattice Average Enrichment v/s Minimum B10 Requirements for the
NUHOMS[®]-61BTH DSC Poison Plates (Intact Fuel)

61BTH DSC	Rackat Turna	Maximum Lattice Average	Minimum B10 Areal Density, mg/cm ²			
Туре	baskel Type	Enrichment (wt% U-235)	Borated Aluminum/MMC	Boral®		
	А	3.7	21.0	25.2		
	В	4.1	32.0	38.4		
1	С	4.4	40.0	48.0		
7	D	4.6	48.0	57.6		
	E	4.8	55.0	66.0		
	F	5.0	62.4	74.9		
	A	3.7	22.3	26.8		
	В	4.1	32.0	38.4		
2	С	4.4	41.7	50.0		
.2	D	4.6	48.0	57.6		
	E	4.8	55.0	66.0		
	F	5.0	62.4	74.9		

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Table 1-1w

BWR Fuel Assembly Lattice Average Enrichment v/s Minimum B10 Requirements for the NUHOMS[®]-61BTH DSC Poison Plates (Damaged Fuel)

64DTU		Maximum Lattice (wt%	Average Enrichment	Minimum B10 Areal Density, mg/cm²		
DSC Type	Basket Type	Up to 4 Damaged Assemblies ⁽¹⁾	Five or More Damaged Assemblies ⁽¹⁾ (16 Maximum)	Borated Aluminum/MMC	Boral®	
	A	3.7	2.80	21.0	25.2	
	В	4.1	3.10	32.0	38 <i>.4</i>	
1	С	4.4	3.20	. 40.0	48.0	
,	D	4.6	3.40	48.0	57.6	
	E	4.8	3.50	55.0	66.0	
	F	5.0	3.60	62.4	74.9	
	A	3.7	2.80	22.3	26.8	
	В	4.1	3.10	32.0	38.4	
2	С	4.4	3.20	41.7	.50.0	
2	D	4.6	3.40	48.0	57.6	
	E	4.8	3.50	55.0	66.0	
	F	5.0	3.60	62.4	74.9	

Note 1: See Figure 1-25 for the location of damaged fuel assemblies within the 61BTH DSC.

 Table 1-1aa

 PWR Fuel Specification for the Fuel to be Stored in the NUHOMS[®]-32PTH1 DSC

Physical Parameters:	
Fuel Class	Intact or damaged unconsolidated B&W 15x15, WE 17x17, CE 15x15, WE 15x15, CE 14x14, WE 14x14 and CE 16x16 class PWR assemblies (with or without control components) that are enveloped by the fuel assembly design characteristics listed in Table 1-1bb. Reload fuel manufactured by other vendors but enveloped by the design characteristics listed in Table 1-1bb is also acceptable.
Fuel Damage	Damaged PWR fuel assemblies are assemblies containing missing or partial fuel rods or fuel rods with known or suspected cladding defects greater than hairline cracks or pinhole leaks. The extent of damage in the fuel assembly is to be limited such that the fuel assembly will still be able to be handled by normal means and retrievability is assured following normal and off-normal conditions.
Reconstituted Fuel Assemblies:	
 Maximum No. of Reconstituted Assemblies per DSC With Irradiated Stainless Steel Rods 	4
Maximum No. of Irradiated Stainless Steel Rods per Reconstituted Fuel Assembly	10
 Maximum No. of Reconstituted Assemblies per DSC with unlimited number of low enriched UO₂ rods, or Zr Rods or Zr Pellets or Unirradiated Stainless Steel Rods 	32
	Up to 32 CCs are authorized for storage in 32PTH1- S, 32PTH1-M and 32PTH1-L DSCs .
Control Components (CCs)	 Authorized CCs include Burnable Poison Rod Assemblies (BPRAs), Thimble Plug Assemblies (TPAs), Control Rod Assemblies ((CRAs), Rod Cluster Control Assemblies (RCCAs), Axial Power Shaping Rod Assemblies (APSRAs), Orifice Rod Assemblies (ORAs), Vibration Suppression Inserts (VSIs), Neutron Source Assemblies (NSAs) and Neutron Sources. Design basis thermal and radiological characteristics for the CCs are listed in Table 1-1ee
No. of Intact Assemblies	≤ 32
	Up to 16 damaged fuel assemblies with balance intact fuel assemblies, or dummy assemblies are authorized for storage in 32PTH1 DSC.
No. and Location of Damaged Assemblies	Damaged fuel assemblies are to be placed in the center 16 locations as shown in Figures 1-26 through 1-28. The DSC basket cells which store damaged fuel assemblies are provided with top and bottom end caps to assure retrievability.
Maximum Assembly plus CC Weight	1715 lbs

Table 1-1aa PWR Fuel Specification for the Fuel to be Stored in the NUHOMS[®]-32PTH1 DSC

(Concluded)

THERMAL /RADIOLOGICAL PARAMETERS'	
Allowable Heat Load Zoning Configurations for each 32PTH1 DSC	Per Figure 1-26 or Figure 1-27 or Figure 1-28.
Bumup, Enrichment, and Minimum Cooling Time for Configuration 1	Per Table 1-5a for Zone 1 fuel, Per Table 1-5d and Table 1-5e for Zone 5 fuel, and Per Table 1-5f for Zone 6 fuel.
Bumup, Enrichment, and Minimum Cooling Time for Configuration 2	Per Table 1-5c for Zone 4 and Zone 3 fuel.
Bumup, Enrichment, and Minimum Cooling Time for Configuration 3	Per Table 1-5b for Zone 2 fuel.
Maximum Assembly Average Initial Fuel Enrichment	5.0 wt. % U-235
Maximum Decay Heat Limits for Zones 1, 2, 3, 4, 5 and 6 Fuel	Per Figure 1-26 or Figure 1-27 or Figure 1-28.
	≤ 40.8 kW for 32PTH1-S, 32PTH1-M and 32PTH1-L DSCs (Type 1 Basket)
Decay Heat per DSC	≤ 31.2 kW for 32PTH1-S, 32PTH1-M and 32PTH1-L DSCs (Type 2 Basket)
Maximum Boron Loading	Per Table 1-1cc or Table 1-1dd

Table 1-1bb	
PWR Fuel Assembly Design Characteristics for the NUHOMS [®] -32PTH1 DSC	1."

Assemt	oly Class	B&W 15x15	WE 17x17	CE 15x15	WE 15x15	CE 14x14	WE 14x14	CE 16x16
	32PTH1-S	165.75	165.75	165.75	165.75	165.75	165.75	165.75
Unirradiated	32PTH1-M	171.93	171.93	171.93	171.93 [.]	171.93	171.93	171.93
Length (m) ^{, ,}	32PTH1-L	178.3	178.3	178.3	178.3	178.3	178.3	178.3
Fissile Materia	a/	UO2	UO2	UO2	UO2	UO2	UO₂	UO2
Maximum MT	U/Assembly ⁽²⁾	0.49	0.49	0.49	0.49	0.49	0.49	0.49
Maximum Nur Rods	mber of Fuel	208	264	216	204	176	179	236
Maximum Nur Instrument Tu	nber of Guide/ bes	17	25	9	21	5	17	5

Notes:

(1) Maximum Assembly + Control Component Length (unirradiated)
(2) The maximum MTU/assembly is based on the shielding analysis. The listed value is higher than the actual.

Table 1-1ccMaximum Assembly Average Initial Enrichment v/s Neutron Poison Requirements for 32PTH1DSC (Intact Fuel)

	Maximum 235) as a	Assembly Function Basket Ty	/ Average of Soluble /pe (Fixed	Initial Enr Boron Co Poison L	ichment (oncentrati oading)	wt. % U- on and
Fuel Assembly Class	Minimum		B	asket Typ	e	
	Soluble Boron (ppm)	1A or 2A	1B or 2B	1C or 2C	1D or 2D	1E or 2E
	2000	3.40	3.80	3.90	4.10	4.30
	2300	3.70	4.00	4.20	4.40	4.70
WE 17x17 Assombly Class ⁽⁴⁾	2400	3.70	4.10	4.30	4.50	4.80
WE TIXTI ASSEMILTY CIASS	2500	3.80	4.20	4.40	4.60	4.90
	2800	4.00	4.50	4.70	5.00	5.00
	3000	4.20	4.60	4.80	5.00	5.00
	2000	3.90	4.30	4.50	4.80	5.00
•	2300	4.10	4.60	4.80	5.00	5.00
CE 16x16 Assembly Class ⁽⁵⁾	2400	4.20	4.70	. 4.90	5.00	5.00
CE TOXTO ASSEMDLY CLASS	2500	4.30	4.80	5.00	.5.00	5.00
	2800	4.60	5.00	5.00	5.00	5.00
	3000	4.70	5.00	5.00	5.00	5.00
	2000	3.30	3.60	3.80	4.00	4.20
	2300	3.50	3.90	4.10	4.30	4.60
RW 15x15 Assembly Class ⁽⁵⁾	2400	3.60	4.00	4.20	4.40	4.70
Div Tox To Assembly Class	2500	3.70	4.10	4.30	4.50	4.80
	2800	3.90	4.30	4.50	4.80	5.00
· · ·	3000	4.10	4.50	4.70	5.00	5.00
	2000	3.50	3.90	4.00	4.20	4.40
	2300	3.80	4.10	4.30	4.60	4.80
CF 15x15 Assembly Class ⁽⁵⁾	2400	3.90	4.30	4.40	4.70	4.90
	2500	3.90	4.35	4.50	4.80	5.00
	2800	4.20	4.60	4.80	5.00	5.00
	3000	4.30	4.80	5.00	5.00	5.00

Table 1-1cc Maximum Assembly Average Initial Enrichment v/s Neutron Poison Requirements for 32PTH1 DSC (Intact Fuel) (Concluded)

	Maximum 235) as a	Assembly Function Basket Ty	/ Average of Soluble /pe (Fixed	Initial Enr Boron Co Poison Lo	ichment (oncentrati oading)	wt. % U- on and
Fuel Assembly Class	Minimum		B	asket Typ	e	
	Soluble Boron (ppm)	1A or 2A	1B or 2B	1C or 2C	1D or 2D	1E or 2E
	2000	3.50	3.80	3.90	4.20	4.40
	2300	3.70	4.10	4.20	4.50	4.80
WE 15x15 Accombly Clocc ⁽⁵⁾	2400	3.80	4.20	4.40	4.60	4.90
WE TOX TO ASSEMDLY CIASS"	2500	3.90	4.30	4.50	4.70	5.00
	2800	4.10	4.50	4.70	5.00	5.00
	3000	4.20	4.70	4.90	5.00	5.00
	2000	3.90	4.40	4.60	4.90	5.00
	2300	4.20	4.70	5.00	5.00	5.00
CE 14x14 Accombly Class ⁽⁶⁾	2400	4.30	4.80	5.00	5.00	5.00
CE 14X14 ASSembly Class	2500	4.40	5.00	5.00	5.00	5.00
	2800	4.60	5.00	5.00	5.00	5.00
	3000	4.80	5.00	5.00	5.00	5.00
	2000	4.20	4.70	4.90	5.00	5.00
	2300	4.50	5.00	5.00	5.00	5.00
WE 14x14 Assembly Class ⁽⁷⁾	2400	4.60	5.00	5.00	5.00	5.00
TE TA TA ASSEITINIY CIUSS	2500	4.70	5.00	5.00	5.00	5.00
	2800	5.00	5.00	5.00	5.00	5.00
	3000	5.00	5.00	5.00	5.00	5.00

Notes:

(1) Not used.

(2) Not used.

(3) Not used.

- (4) Reduce Enrichment by 0.05 wt. % U-235 for assemblies with CCs that extend into the active fuel region.
- (5) Reduce Enrichment by 0.10 wt. % U-235 for assemblies with CCs that extend into the active fuel region.
- (6) Reduce Enrichment by 0.25 wt. % U-235 for assemblies with CCs that extend into the active fuel region.
- (7) No reduction in Enrichment required for assemblies with CCs that extend into the active fuel region.

Table 1-1ddMaximum Assembly Average Initial Enrichment v/s Neutron Poison Requirements for
32PTH1 DSC (Damaged Fuel)

	Maximum	Assembly	/ Average	Initial Enr	richment (vt. % U-
	235) as a	Function Backet T	of Soluble	Boron Co Boison L	oncentrati oading)	on and
Fuel Assembly Class	Minimum	Daskelij	pe (i ixed B	asket Tvp	e	
	Soluble Boron (ppm)	1A or 2A	1B or 2B	1C or 2C	1D or 2D	1E or 2E
	2000	3.40	3.70	3.80	4.05	4.25
	2300	3.60	3.95	4.10	4.35	4.65
WE 17x17 Assembly Class	2400	3.70	4.05	4.20	4.45	4.75
(without CCs)	2500	3.75	4.15	4.30	4.55	4.85
	2800	4.00	4.40	4.60	4.85	5.00
	3000	4.15	4.55	4.75	5.00	5.00
	2000	.3.35	3.65 [.]	3.75	4.00	4.20
	2300	3.55	3.90	4.05	4.30	4.55
WE 17x17 Assembly Class	2400	3.65	4.00	4.15	4.40	<u>4</u> .70
(with CCs)	2500	3.70	4.10	4.25	4.50	4.75
•	2800	3.95	4.35	4.55	4.80	5.00
	3000	4.10	4.50	4.70	5.00	5.00
	2000	3.65	4.05	4.20	4.50	4.75
	2300	3.90	4.30	4.50	4.80	5.00
WE 16x16 Assembly Class	2400	4.00	4.40	4.60	4.90	5.00
(without CCs)	2500	4.05	4.50	4.70	5.00	5.00
	2800	4.30	4.80	5.00	5.00	5.00
	3000	4.50	4.95	5.00	5.00	5.00
•	2000	3.60	3.95	4.10	4.40	4.65
	2300	3.80	4.20	4.40	4.70	4.90
WE 16x16 Assembly Class	2400	3.90	4.30	4.50	4.80	5.00
(with CCs)	2500	4.00	4.40	4.60	4.80	5.00
	2800	4.20	4.70	4.90	5.00	5.00
	3000	4.40	4.85	5.00	5.00	5.00
	2000	3.30	3.60	3.75	3.95	4.20
	2300	3.50	3.90	4.05	4.30	4.50
BW 15x15 Assembly Class	2400	3.60	· 4.00	4.15	4.40	4.65
(without CCs)	2500	3.65	4.05	4.20	4.50	4.75
	2800	3.90	4.30 .	4.50	4.75	5.00
	3000	4.05	4.45	4.65	5.00	5.00

Table 1-1dd Maximum Assembly Average Initial Enrichment v/s Neutron Poison Requirements for 32PTH1 DSC (Damaged Fuel) (continued)

	Maximum 235) as a	Assembly Function Basket Ty	y Average of Soluble ype (Fixed	Initial Enr Boron C Poison L	ichment (oncentrati oading)	wt. % U- on and
Fuel Assembly Class	Minimum		E	Basket Typ	е	
	Soluble Boron (ppm)	1A or 2A	1B or 2B	1C or 2C	1D or 2D	1E or 2E
	2000	3.20	3.50	3.65	3.90	4.10
	2300	3.40	3.80	3.95	4.20	4.40
BW 15x15 Assembly Class	2400	3.50	3.90	4.05	4.30	4.55
(with CCs)	2500	3.60	4.00	4.15	4.40	4.65
·	2800	3.80	4.20	4.40	4.65	4.90
	3000	3.95	4.40	4.55	4.90	5.00
	2000	3.35	3.70	3.80	4.05	4.25
	2300	3.60	3.95	4.10	4.30	4.60
CE 15x15 Assembly Class	2400	3.65	4.05	4.20	4.45	4.70
(without CCs)	2500	3.75	4.15	4.30	4.55	4.80
	2800	4.00	4.40	4.60	4.85	5.00
	3000	4.15	4.55	4.75	5.00	5.00
	2000	3.30	3.65	3.80	4.00	4.20
	2300	3.55	3.90	4.05	4.30	4.55
CE 15x15 Assembly Class	2400	3.65	4.00	4.15	4.45	4.65
(with CCs)	2500	3.70	4.10	4.25	4.50	4.80
	2800	3.95	4.35	4.55	4.80	5.00
	3000	4.10	4.55	4.70	5.00	5.00
	2000	3.40	3.75	3.90	4.15	4.30
	2300	3.65	4.00	4.20	4.45	4.70
WE 15x15 Assembly Class	2400	3.75	4.10	4.30	4.55	4.80
(without CCs)	2500	3.80	4.20	4.40	4.65	4.90
	2800	4.05	4.45	4.60	4.90	5.00
·	3000	4.20	4.60	4.80	5.00	5.00

Table 1-1ddMaximum Assembly Average Initial Enrichment v/s Neutron Poison Requirements for
32PTH1 DSC (Damaged Fuel)
(Continued)

	Maximum 235) as a	Assembly Function Basket Ty	/ Average of Soluble /pe (Fixed	Initial Enr Boron Co Poison L	ichment (\ oncentrati oading)	wt. % U- on and
Fuel Assembly Class	Minimum		B	asket Typ	e	
	Soluble Boron (ppm)	1A or 2A	1B or 2B	1C or 2C	1D or 2D	1E or 2E
	2000	3.35	3.65	3.80	4.00	4.20
	2300	3.55	3.90	4.10	4.35	4.60
WE 15x15 Assembly Class	2400	3.65	4.00	`4.20	4.45	4.70
(with CCs)	2500	3.70	4.10	4.30	4.55	4.80
	2800	3.95	4.35	4.50	4.80	5.00
	3000	4.10	4.50	4.70	5.00	5.00
	2000	3.70	4.10	4.30	4.60	4.85
	2300	3.95	4.40	4.60	4.95	5.00
CE 14x14 Assembly Class	2400	4.05	4.50	4.70	5.00	5.00
(without CCs)	2500	4.15	. 4.60	4.80	5.00	5.00
· · · · · · · · · · · · · · · · · · ·	2800	4.40	4.90	5.00	5.00	5.00
	3000	4.55	5.00	5.00	5.00	5.00
	2000	3.55	3.95	4.10	4.35	4.60
	2300	3.80	4.20	4.40	4.70	4.90
CE 14x14 Assembly Class	2400	3.9	4.30	4.50	4.80	5.00
(with CCs)	2500	4.00	4.40	4.60	4.90	5.00
	2800	4.20	4.65	4.90	5.00	5.00
•	3000	4.35	4.85	5.00	5.00	5.00
	2000	3.75	4.15	4.30	4.60	4.85
,	2300	3.95	4.45	4.65	5.00	5.00
WE 14x14 Assembly Class	2400	4.05	4.55	4 75	5.00	5.00
(without CCs)	2500	4.15	4.65	4.85	5.00	5.00
	2800	4.40	4.90	5.00	5.00	5.00
	3000	4.60	5.00	5.00	5.00	5.00
	2000	3.70	4.10	4.20	4.50	4.75
	2300	3.90	4.40	4.60	4.90	5.00
WE 14x14 Assembly Class	2400	4.00	4.50	4.65	5.00	5.00
(with CCs)	2500	4.10	4.55	4.80	5.00	5.00
	2800	4.30	4.80	5.00	5.00	5.00
	3000	4.50	5.00	5.00	5.00	5.00

Table 1-1eeThermal and Radiological Characteristics for Control Components Stored in the
NUHOMS®-32PT and NUHOMS®-32PTH1 DSCs

Parameter	BPRAs, NSAs, CRAs, RCCAs, VSIs, Neutron Sources, and APSRAs	TPAs and ORAs
Maximum Gamma Source (γ/sec/DSC)	1.25E+15	1.3E+14
Decay Heat (Watts/DSC)	256.0	256.0

32PTH1 DSC Basket Type	Minimum B10 Areal Density for Boral [®] (mg/cm²)	Minimum B10 Areal Density for B-Al ⁽¹⁾ (mg/cm ²)
1A or 2A	9.0	7.0
1B or 2B	19.0	15.0
1C or 2C	25.0	20.0
1D or 2D	N/A	32.0
1E or 2E	N/A	50.0

 Table 1-1ff

 B10 Specification for the NUHOMS[®]-32PTH1 Poison Plates

Note:

(1) B-AI = Metal Matrix Composites and Borated Aluminum Alloys.

Table 1-2a

PWR Fuel Qualification Table for the Standardized NUHOMS[®]-24P DSC (Fuel Without BPRAs)

Burnup								Ini	tial E	nricht	nent	wt. 9	6 U-2	35)							
(GWd/ MTU)	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0
10	a	a	a	a	a	a	a	a	a	а	a	a	a	a	а	а	a	а	a	а	a
15	5	5	a	а	а	a	а	а	a	а	а	а	а	а	а	а	a	a	a	а	а
20	5	5	5	5	5	a	а	а	a	а	а	а	а	а	а	a	а	а	a	а	а
25		5	5	5	5	5	5	5	5	а	a	а	a	a	a	а	a	а	a	а	а
28				5	5	5	5	5	5	5	5	5	a	а	а	а	a	a	a	а	a
30						5	5	5	5	5	5	5	5	а	а	а	а	a	a	а	a
32							5	5	5	5	5	5	5	5	5	а	а	a	a	а	а
34								.6	5	5	5	5	5	5	5	5	5	а	a	а	а
36	att second to be a second		_					-	6	6	6	6	5	5	5	5	5	5	5	а	, a
38										[7	6	6	6	6	6	6	6	5	5	5
40				No	ot Ace	ceptal	blė					8	8	8	7	6	6	6	6	6	6
41					· 0	r						9	9	9	8	8	8	8	8	8	8
42				N	ot Ar	nalyze	d						10	9	9	9	9	9	9	8	8
43													10	10	10	10	10	9	9	9	9
44														11	11	11	11	10	10	10	10
45							·							12	12	11	11	11	11	11	11

(Minimum required years of cooling time after reactor core discharge)

a) Minimum Cooling Time 5 years, and Minimum 2350 ppm soluble boron required in the DSC cavity water during loading or unloading.

Notes:

- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- Round burnup UP to next higher entry, round enrichments.DOWN to next lower entry.
- Fuel with an initial enrichment less than 2.0 wt. % U-235 must be qualified for storage using the alternate nuclear parameters specified in Table 1-1a. Fuel with an initial enrichment greater than 4.0 wt. % U-235 is unacceptable for storage.
- Fuel with a burnup greater than 45 GWd/MTU is unacceptable for storage.
- Example: An assembly with an initial enrichment of 3.65 wt. % U-235 and a burnup of 42.5 GWd/MTU is acceptable for storage after a ten-year cooling time as defined at the intersection of 3.6 wt. % U-235 (rounding down) and 43 GWd/MTU (rounding up) on the qualification table.



Table 1-2bBWR Fuel Qualification Table for the Standardized NUHOMS®-52B DSC

(Minimum required years of cooling time after reactor core discharge)

Burnup								Ini	tial E	nrichi	nent ((wt. %	6 U-2	35) ⁻							
(GWd/ MTU)	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0
15	3	3	3	3	3	3 °	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
20	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	.5	5	5
25	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	. 5	5	5
· 30				5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
32					6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5
34				Second Second St		8	8	8	8	8	8	8	8	7	6	6	6	6	6	6	6
35							10	10	10	10	9	8	8	8	8	8	8	8	6	6	6
36							11	11	11	11	11	10	10	10	10	10	10	9	8	8	8
37	-					and the second second		13	13	12	12	12	12	11	11	11	11	11 -	10	10	10
38								15	14	14	14	13	13	13	13	12	12	12	12	12	11
39		[]	No	ot Acc	eptal	ble		18	17	17	16	16	16	15	14	14	14	14	13	13	13
40				0	ŕ.				21	21	20	20	19	18	17	17	16	16	16	16	15
42			N	ot Ar	alyze	d				22	22	22	21	21	. 20	20	20	19	18	17	17
44										24	24	23	23	23	22	22	21	21	21	20	20
45											25	24	24	23	23	23	22	22	22	21	21

Notes:

- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment less than 2.0 wt. % U-235 must be qualified for storage using the alternate nuclear parameters specified in Table 1-1b. Fuel with an initial enrichment greater than 4.0 wt. % U-235 is unacceptable for storage.
- Fuel with a burnup greater than 45 GWd/MTU is unacceptable for storage. Fuel with a burnup less than 15 GWd/MTU is acceptable after three years cooling time provided the physical parameters from Table 1-1b have been met.
- Example: An assembly with an initial enrichment of 3.05 wt. % U-235 and a burnup of 34.5 GWd/MTU is acceptable for storage after a nine-year cooling time as defined at the intersection of 3.0 wt. % U-235 (rounding down) and 35 GWd/MTU (rounding up) on the qualification table.



Table 1-2c PWR Fuel Qualification Table for the Standardized NUHOMS[®]-24P DSC (Fuel With BPRAs)

Burnup								Ini	tial E	nrich	ment ((wt. %	6 U-2	35)							
(GWd/ MTU)	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0
10	а	a	а	a	a	а	а	a	a	а	a	a	а	а	а	a	a	а	a	а	а
15	5	5	а	а	a	a	а	a	а	а	a	а	а	a	a	a	a	а	a	a	a
20	5	5	5	5	5	a	a	а	a	а	a	а	a	а	а	a	a	a	а	a	а
25	· ·	5	5	5	5	5	5	5	5	а	а	а	a	а	а	a	a	а	a	a	a
28				5	5	5	5	5	5	5	5	5	a	а	а	а	a	a	a	а	а
30						6	6	6	5	5	5	5	5	а	а	a	a	a	a	a	a
32							6	6	6	6	6	6	5	5	5	a	a	a	a	a	а
34								7	6	6	6	6	6	6	6	6	6	а	a	a	а
36			-						8	7	7	7	6	6	6	6	6	6	6	a	a
38											8	8	7	7	7	7	6	6	6	6	6
40			andre Streesees	N	ot Ac	ceptal	ble.					9	9	8	8	8	7	7	7	7	6
41					· 0	r						10	9	9	9	9	8	8	8	8	8
42				N	ot Ar	ialyze	ed	(·					10	10	9	9	9	9	9	9	9
43													11	11	11	10	10	10	10	9	9
44					[12	11	11	11	11	10	10	10
45						·								13	12	12	12	11	11	11	11

(Minimum required years of cooling time after reactor core discharge)

a) Minimum Cooling Time 5 years, and Minimum 2350 ppm soluble boron required in the DSC cavity water during loading or unloading.

Notes:

- BPRA Burnup shall not exceed that of a BPRA irradiated in fuel assemblies with a total burnup of 36,000 MWd/MTU.
- Minimum cooling time for a BPRA is 5 years for B&W designs and 10 years for Westinghouse designs, regardless of the required assembly cooling time.
- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment less than 2.0 wt. % U-235 must be qualified for storage using the alternate nuclear parameters specified in Table 1-1a. Fuel with an initial enrichment greater than 4.0 wt. % U-235 is unacceptable for storage.
- Fuel with a burnup greater than 45 GWd/MTU is unacceptable for storage.
- Example: An assembly with an initial enrichment of 3.65 wt. % U-235 and a burnup of 42.5 GWd/MTU is acceptable for storage after a ten-year cooling time as defined at the intersection of 3.6 wt. % U-235 (rounding down) and 43 GWd/MTU (rounding up) on the qualification table.

Table 1-2d PWR Fuel Qualification Table for 1.2 kW per Assembly Fuel without BPRAs for the NUHOMS[®]-32PT DSC

(Minimum required years of cooling time after reactor core discharge)

Burn- Up												ŀ	٩sse	emb	ly A	vera	age	Initi	al L	J-23	5 Eı	nricl	hme	ent, i	wt %	6											
GWd/ MTU	1.1	1.2	1.4	1.6	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
15	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
25	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
28	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
30	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
32	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
34	7.0	7.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
36	8.0	8.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
38	9.0	9.0	8.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5,0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
39	10.0	9.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0	5,0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
40	10.0	10.0	9.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
41	11.0	10.0	10.0	9.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
42	11.5	11.0	10.0	9.0	9.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
43	13.0	11.5	10.5	10.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
44	13.5	12.5	11.5	10.5	10.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
45	14.5	14.0	12.0	11.0	10.0	10.0	10.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0

• Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.

- For fuel assemblies reconstituted with up to 10 stainless steel rods, increase the indicated cooling time by 1.5 years. If more than 10 stainless steel rods are present, increase the indicated cooling time by 6 years.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment less than 1.1 and greater than 5.0 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 45 GWd/MTU is unacceptable for storage
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 5-years cooling
- Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a six-year cooling time as defined by 3.7 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.



Table 1-2ePWR Fuel Qualification Table for 0.87 kW per Assembly Fuel without BPRAs for the NUHOMS[®]-32PT DSC

(Minimum required years of cooling time after reactor core discharge)

Burn- Up													A	sser	nbly	Ave	rage	Initi	al U	-235	Enr	ichm	nent,	wț 9	%												
GWd/ MTU	1.1	1.2	1.4	1.6	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
15	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
25	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
28	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
30	6.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
32	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
34	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0
36	9.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
38	9.0	9.0	8.5	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0
39	10.0	9.0	9.0	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
40	10.0	10.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
41	11.0	10.5	10.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
42	12.0	11.5	11.0	10.5	10.0	10.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
43	13.0	12.0	10.5	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
44	13.0	13.0	12.5	12.0	11.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.0	8.0
45	14.0	13.5	13.0	12.5	12.5	12.0	12.0	12.0	12.0	10.5	10.5	11.5	10.5	10.5	10.5	10.0	10.0	10.0	9.5	10.0	10.0	10.0	10.0	10.0	10.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0

• Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.

- For fuel assemblies reconstituted with up to 10 stainless steel rods, increase the indicated cooling time by 1.5 years. If more than 10 stainless steel rods are present, increase the indicated cooling time by 6 years.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment less than 1.1 and greater than 5.0 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 45 GWd/MTU is unacceptable for storage
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 5-years cooling.
- Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a eight-year cooling time as defined by 3.7 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.



Table 1-2f PWR Fuel Qualification Table for 0.7 kW Fuel without BPRAs per Assembly for the NUHOMS[®]-32PT DSC

(Minimum required years of cooling time after reactor core discharge)

Burn- Up													As	sem	bly .	Ave	rage	Initi	al U	-235	5 En	richr	nen	t, wt	%												
GWd /MTU	d 1.1 1.2 1.4 1.6 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.0 4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8 4															4.9	5.0																				
10	5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0															5.0	5.0																				
15	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
25	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
28	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
30	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
32	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0
34	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0·	7.0	7.0	7.0	7.0	7.0
36	10.5	10.0	10.0	10.0	10.0	9,0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
38	13.0	13.0	11.5	11.5	11.0	11.0	11.0	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
39	14.0	14.0	13.5	13.0	12.0	11.5	11.5	11.5	11.5	11.5	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
40	14.5	14.5	14.0	14.0	13.5	13.5	13.0	13.0	12.0	12.0	12.0	12.0	11.5	11.5	11.5	11.5	11.5	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	10.0	10:0	10.0	10.0	10.0	10.0
41	16.5	16.0	15.5	14.5	14.0	14.0	14.0	14.0	14.0	13.5	13.5	13.5	13.5	13.5	12.5	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
42	18.0	16.5	16.5	16.0	15.5	15.5	14.5	14.5	14.5	14.5	14.0	14.0	14.0	14.0	14.0	14.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
43	18.5	18.0	18.0	16.5	16.5	16.5	16.5	16.0	16.0	16.0	16.0	15.5	15.5	14.5	14.5	14.5	14.5	14.5	14.0	14.0	14.0	14.0	14.0	14.0	14.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
44	20.0	19.0	18.5	18.5	18.0	18.0	18.0	17.5	16.5	16.5	16.5	16.5	16.0	16.0	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
45	21.0	21.0	20.0	19.0	19.0	19.0	18.5	18.5	18.0	18.0	18.0	18.0	18.0	18.0	17.5	16.5	16.5	16.5	16.5	16.0	16.0	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0

- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- For fuel assemblies reconstituted with up to 10 stainless steel rods, increase the indicated cooling time by 1.5 years. If more than 10 stainless steel rods are present, increase the indicated cooling time by 6 years.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment less than 1.1 and greater than 5.0 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 45 GWd/MTU is unacceptable for storage
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 5-years cooling.
- Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a thirteen-year cooling time as defined by 3.7 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

Table 1-2gPWR Fuel Qualification Table for 0.63 kW per Assembly Fuel without BPRAs for the NUHOMS[®]-32PT DSC

(Minimum required years of cooling time after reactor core discharge)

Burn- Up													A	sser	nbly	Ave	rage	e Init	ial U	-235	Enr	ichm	ient,	wt	%												
GWd /MTU	1.1	1.2	1.4	1.6	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2 .7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
15	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
25	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
28	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
30	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
32	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0
34	11.0	11.0	11.0	10.5	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
36	13.5	13.5	13.0	12.0	12.0	11.5	11.5	11.5	11.5	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
38	16.5	15.5	14.5	14.5	14.5	13.5	13.5	13.5	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	11.0	11.0	11.0	11.0
39	17.5	17.0	16.5	16.0	15.0	15.0	14.5	14.5	14.5	14.5	14.5	14.0	14.0	14.0	14.0	14.0	14.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.0	12.0
40	19.0	18.0	18.0	17.0	16.5	16.5	16.5	16.5	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	15.0	15.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	13.0	13.0	13.0	13.0
41	20.5	19.5	19.0	19.0	18.0	18.0	17.5	17.5	17.5	17.0	17.0	17.0	17.0	17.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.0
42	22.0	20.5	20.5	19.5	19.5	19.5	19.0	19.0	18.5	18.5	18.5	18.0	18.0	18.0	18.0	18.0	18.0	17.0	17.0	17.0	17.0	17.0	17.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
43	23.0	22.5	22.5	21.5	21.5	21.0	20.0	20.0	19.5	19.5	19.5	19.0	19.0	19.0	19.0	19.0	19.0	19.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
44	24.5	24.5	23.0	23.0	22.0	22.0	22.0	22.0	21.5	21.5	21.5	21.0	21.0	21.0	20.0	20.0	20.0	20.0	20.0	20.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
45	25.5	25.5	25.0	24.0	23.0	23.0	23.0	23.0	23.0	22.5	22.5	22.5	22.0	22.0	22.0	22.0	22.0	21.0	21.0	21.0	21.0	21.0	21.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.0	19.0

- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- For fuel assemblies reconstituted with up to 10 stainless steel rods, increase the indicated cooling time by 1.5 years. If more than 10 stainless steel rods are present, increase the indicated cooling time by 6 years.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment less than 1.1 and greater than 5.0 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 45 GWd/MTU is unacceptable for storage
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 5-years cooling.
- Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a sixteen-year cooling time as defined by 3.7 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.



Table 1-2h

PWR Fuel Qualification Table for 0.6 kW per Assembly Fuel without BPRAs for the NUHOMS®-32PT DSC

(Minimum required years of cooling time after reactor core discharge)

Burn- Up													As	sem	bly	Ave	rage	Initi	al U	-235	5 En	richr	nen	t, wt	%												
GWd /MTU	1.1 1.2 1.4 1.6 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.0 4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8 4.9															4.9	5.0																				
10	5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0															5.0	5.0																				
15	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
25	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0	5.0	5.0
28	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
30	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
32	10.5	10.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
34	12.0	12.0	12.0	11.5	11.0	11.0	11.0	11.0	11.0	11.0	11.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.0	9.0	9.0	9.0	9.0	9.0
36	14.5	14.5	14.0	14.0	13.5	13.5	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
38	17.5	17.5	16.5	16.5	16.5	16.0	16.0	15.5	15.5	15.0	15.0	15.0	15.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
39	19.5	19.0	18.5	18.0	17.0	16.5	16.5	16.5	16.5	16.0	16.0	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
40	20.5	20.0	20.0	19.0	19.0	18.5	18.5	18.5	18.0	18.0	18.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	15.0	15.0
41	22.5	21.5	21.0	21.0	20.0	20.0	19.5	19.5	19.5	19.0	19.0	19.0	19.0	19.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.0
42	24.0	22.5	22.5	21.5	21.5	21.5	21.0	21.0	21.0	21.0	21.0	20.0	20.0	20.0	20.0	20.0	20.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
43	25.0	24.5	24.5	23.5	23.5	23.0	22.0	22.0	22.0	21.5	21.5	21.5	21.0	21.0	21.0	21.0	21.0	21.0	21.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.0	19.0	19.0	19.0	19.0	19.0
44	26.5	26.5	25.0	25.0	24.0	24.0	24.0	24.0	23.5	23.5	23.5	23.0	23.0	23.0	23.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	20.0	20.0
45	27.5	27.5	27.0	26.0	26.0	25.0	25.0	25.0	25.0	24.5	24.5	24.5	24.0	24.0	24.0	24.0	24.0	24.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0

• Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.

- For fuel assemblies reconstituted with up to 10 stainless steel rods, increase the indicated cooling time by 1.5 years. If more than 10 stainless steel rods are present, increase the indicated cooling time by 6 years.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment less than 1.1 and greater than 5.0 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 45 GWd/MTU is unacceptable for storage
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 5-years cooling.
- Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a nineteen-year cooling time as defined by 3.7 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

 Table 1-2i

 PWR Fuel Qualification Table for 1.2 kW per Assembly Fuel with BPRAs for the NUHOMS[®]-32PT DSC

BU													Ini	tial E	nrich	ment	t wt %	6 U-2	235												
(GWd/ MTU)	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
15	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
20	-5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
25		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
28				5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
30						5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
32							5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
34				[5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
36									5	5	5	5	5	5	5	5	5	5	5	5	5	-5	5	5	5	5	5	5	5	5	5
38											5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
39											5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
40			No	t An	alyz	red						5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
41						o. Prosecurio						6	6	5	5	5	5	5	5	5	5.	5	5	5	5	5	5	5	5	5	5
42				auder memory							-	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5
43													6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5
44											Sec. Date		Provense La com	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
45														6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

(Minimum required years of cooling time after reactor core discharge)

• Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel gualification.

- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment less than 2.0 and greater than 5.0 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 45 GWd/MTU is unacceptable for storage
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 5-years cooling
- Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a six-year cooling time as defined by 3.7 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

Table 1-2jPWR Fuel Qualification Table for 0.87 kW per Assembly Fuel with BPRAs for the NUHOMS[®]-32PT DSC

BU													Ini	tial E	nrich	men	t wt %	6 U-2	235												
(GWd/ MTU)	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
. 15	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
20	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
25		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
28				5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
30				[5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
32							6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
34								6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
36				L					7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
38		and the second								·	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7.	7	7	7	6	6
39											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
40			No	t An	alyz	zed						8	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
41						ر بر رو						8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7
42		-1-1-1		• •								9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
43		-					4.						9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	8
44														9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
45										[, .]				10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	9	9	·9

(Minimum required years of cooling time after reactor core discharge)

- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment less than 2.0 and greater than 5.0 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 45 GWd/MTU is unacceptable for storage
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 5-years cooling.
- Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a eight-year cooling time as defined by 3.7 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

Table 1-2kPWR Fuel Qualification Table for 0.7 kW per Assembly Fuel with BPRAs for the NUHOMS®-32PT DSC

BU													Ini	tial E	nrich	men	t wt %	6 U-2	235												
(GWd/ MTU)	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	5	5	5	5	5	5	5	5	5	5	5	5	5	_5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
15	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
20	5	5	5	5	5	5	5	5	5	5·	5	5	5	5	5	5	5	5	5	5	• 5	5	5	5	5	5	5	5	5	5	5
25		5 ·	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
28				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5
30						6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
32						Γ	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
34								8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7	7
36									9	9	9	9	9.	9	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8
38) (][]					10	10	10	10	10	10	10	10	10	10	10	10	9	9	9	9	9	9	9	9	9
39			ļ								11	11	11	11	11	11	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
40			No	t Ar	alyz	zed						12	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
41]	التحر ودعا		ferran estatus						13	13	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11
42					2010/00/0010				1			14	14	13	13	13	13	13	13	13	13	13	13	13	12	12	12	12	12	12	12
43	L				1								15	14	14	14	14	14	14	14	14	14	14	14	13	13	13	13	13	13	13
44		(m. m. m. m.												16	15	15	15	15	15	15	15	15	15	15	15	14	14	14	14	14	14
45											5. 10	[·	17	17	16	16	16	16	16	16	16	16	16	16	16	15	15	15	15	15

- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment less than 2.0 and greater than 5.0 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 45 GWd/MTU is unacceptable for storage
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 5-years cooling.
- Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a thirteen-year cooling time as defined by 3.7 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

Table 1-21PWR Fuel Qualification Table for 0.63 kW per Assembly Fuel with BPRAs for the NUHOMS[®]-32PT DSC

BU													Ini	tial E	nrich	ment	t wt %	6 U-2	235												
(GWd/ MTU)	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7 .	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
15	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
20	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5.	5	5	5	5	5	5	5	5	5
25		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
28				7	7	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
30						7	7	7	7	7	7	7	7	7	7	7 ·	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
32							8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
34								10	10	9	9	9.	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
36									11	11	11	11	11	11	11	11	11	11	11	10	10	10	10	10	10	10	10	10	10	10	10
38											13	13	13	13	13	13	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
39											14	14	14	14	14	14	14	13	13	13	13	13	13	13	13	13	13	13	13	13	13
40			No	t An	alyz	zed						15	15	15	15	15	15	15	14	14	14	14	14	14	14	14	14	14	14	14	14
41												16	16	16	16	16	16	16	16	16	16	16	15	15	15	15	15	15	15	15	15
42			<u></u>									18	18	17	17	17	17	17	17	17	17	17	17	17	16	16	16	16	16	16	16
43								[19	19	19	19	18	18	18	18	18	18	18	18	18	18	18	18	17	17	17
44														20	20	20	20	20	20	20	19	19	19	19	19	19	.19	19	19	19	19
45		[[22	21	21	21	21	21	21	21	21	21	20	20	20	20	20	20	20	20

(Minimum required years of cooling time after reactor core discharge)

- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment less than 2.0 and greater than 5.0 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 45 GWd/MTU is unacceptable for storage
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 5-years cooling.
- Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a seventeen-year cooling time as defined by 3.7 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

Table 1-2mPWR Fuel Qualification Table for 0.6 kW per Assembly Fuel with BPRAs for the NUHOMS[®]-32PT DSC

BU													Ini	tial E	nrich	men	wt %	6 U-2	235												
(GWd/ MTU)	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	5	5	5	5	5	5	5	5	5	5	5 ·	5	5	5	5	5	5	5	5	5	5	5 ·	5	5	5	5	5	5	5	5	5
15	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
20	5	5 -	5	5	5	5.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
25		6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
28				7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
30						8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	7	7
32							9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8
34								11	11	11	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
36									12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11	11
38											15	15	14	14	14	14	14	14	14	14	14	14	14	14	14	14.	14	14	14	13	13
39						·					16	16	16	16	16	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
40			Not	An	alyz	ed						17	17	17	17	17	17	17	17	16	16	16	16	16	16	16	16	16	16	16	16
41				•								19	18	18	18	18	18	18	18	18	18	18	18	17	17	17	17	17	17	17	17
42												20	20	20	20	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
43													21	21	21	21	21	21	21	21	20	20	20	20	20	20	20	20	20	20	20
44											Andre Antraja, Pat			23	22	22	22	22	22	22	22	22	22	22	22	21	21	21	21	21	21
45														24	24	24	24	24	23	23	23	23	23	23	23	23	23	23	23	23	22

(Minimum required years of cooling time after reactor core discharge)

• Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.

• Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.

• Fuel with an initial enrichment less than 2.0 and greater than 5.0 wt.% U-235 is unacceptable for storage.

• Fuel with a burnup greater than 45 GWd/MTU is unacceptable for storage

• Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 5-years cooling.

• Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a nineteen-year cooling time as defined by 3.7 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

Table (1-2n
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PWR Fuel Qualification Table for Zone 1 with 0.7 kW per Assembly, Fuel with or without BPRAs, for the NUHOMS[®]-24PHB DSC

(Minimum required years of cooling time after reactor core discharge)

BU									A	Assem	bly Av	erage	Initial	U-235	5 Enrie	chmen	t (wt %	6)								
(GWd/ MTU)	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5
10	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
15 .	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
25		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
28			5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
30						6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
32			turning	Del fortunitation of			7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
34								8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
36.		wildow -		l		ي و د رشم .			9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
38									a destroy and		10.5	10.5	10.5.	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5
39		and the second s	S								11.5	11.0	11.0	11.0	11.0	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
40) 									12.0	12.0	12.0	12.0	12.0	12.0	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.0	11.0	11.0
41					l				and forther streets and		13.0	13.0	13.0	13.0	13.0	13.0	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.0	12.0	12.0
42	ļ										14.5	14.5	14.0	14.0	14.0	14.0	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.0	13.0	13.0
43	بەرەت مىسىد		No	of Án	alvz	ed					15.5	15.5	15.5	15.0	15.0	15.0	15.0	15.0	14.5	14.5	14.5	14.5	14.5	14.5	14.0	14.0
44						, <u> </u>				<u></u>	17.0	16.5	16.5	16.5	16.5	16.0	16.0	16.0	16.0	16.0	15.5	15.5	15.5	15.5	15.5	15.5
45). 		د. میدهندست		() {}						<u>.</u>		18.0	17.5	17.5	17.5	17.5	17.0	17.0	17.0	17.0	17.0	16.5	16.5	16.5	16.5
46	<u>l</u>					<u> </u>						-	18.8	18.7	18.5	18.5	18.3	18.2	18.1	18.0	17.9	17.8	17.7	17.6	17.5	17.4
47													20.1	20.0	19.9	19.6	19.6	19.5	19.4	19.2	19.1	19.0	18.9	18.8	18.7	18.7
48 .													21.4	21.3	21.1	21.0	20.8	20.8	20.7	20.5	20.4	20.3	20.2	20.1	20.0	19.9
49	<u></u>			 				ļ				ļ.	22.7	22.6	22.4	22.3	22.1	22.1	21.9	21.8	21.7	21.6	21.5	21.4	21.3	21.2
50				ľ	i.		.	· · · ·				/ /			23.7	23.6	23.5	23.4	23.3	23.2	23.0	22.9	22.8	22.7	22.6	22.5
) ;=:			1.22.2 yr		بستنشده متر		a							25.0	24.9	24.8	24.6	24.5	24.4	24.3	24.2	24.0	23.9	23.8	23.7
52		-		منت ۵۰ سط										l	26.3	26.2	26.0	25.9	25.8	25.7	25.6	25.4	25.3	25.2	25.2	25.0
53			*			ļ	anna deser	<u>.</u>		<u></u>		<u> </u>	i.		27.5	21.3	21.2	27.1	27.0	26.9	26.8	26.7	26.5	26.4	26.4	26.2
54	L								-	\					28.8	28.6	28.5	28.3	28.2	28.1	28.0	28.0	27.8	21.1	27.6	27.5
55				3								1			29.9	29.8	29.7	29.6	29.5	29.5	29.2	[29.1	29.0	128.9	28.8	28.7

• BU = Assembly average burnup

• Use burnup and enrichment to lookup minimum cooling time in years. For fuel assemblies reconstituted with up to 10 stainless steel rods only, if the lookup cooling time is less than 9.0 years then a minimum cooling time of 9.0 years shall be used. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.

• Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.

• Fuel with an initial enrichment greater than 4.5 wt.% U-235 is unacceptable for storage.

• Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 5-years cooling.

• Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 46.5 GWd/MTU is acceptable for storage after a 19.5 years cooling time as defined by 3.7 wt. % U-235 (rounding down) and 47 GWd/MTU (rounding up) on the qualification table.

• See Figure 1-8 for a description of zones.

• For assemblies fuel reconstituted with Zircaloy clad uranium-oxide rods use the assembly average enrichment to determine the minimum cooling time.

Table 1-20

PWR Fuel Qualification Table for Zone 2 with 1.0 kW per Assembly, Fuel with or without BPRAs, for the NUHOMS[®]-24PHB DSC

(Minimum required years of cooling time after reactor core discharge)

BU									A	ssem	bly Av	erage	Initial	U-235	5 Enric	hment	t (wt %	6)								
(GWd/MTU)	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5
10	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
15	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
25		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
28			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
30						5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
32							5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
34	~ * *							5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
36									5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
38											6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
39											6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5
40										L	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
41			C. Same		States and						6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0
42	-										7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
43	l L										7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5
44	and and and										7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
45			No	t An	alyz	zed							8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.4
46				~									8.2	8.1	8.0	8.0	7.9	7.8	7.8	7.7	7.7	7.6	7.6	7.5	7.5	7.4
47													8.7	8.6	8.5	8.4	8.4	8.3	8.2	8.2	8.1	8.0	8.0	7.9	7.9	7.8
48					[9.2	9.1	9.0	9.0	8.9	8.8	8.7	8.6	8.6	8.5	8.5	8.4	8.3	8.3
49								1.0.2.5					9.8	9.7	9.6	9.5	9.4	9.3	9.2	9.2	9.1	9.0	9.0	8.9	8.8	8.7
50															10.2	10.1	10.0	9.9	9.8	9.7	9.6	9.6	9.5	9.4	9.3	9.3
51															10.9	10.8	10.7	10.6	10.5	10.3	10.3	10.2	10.1	10.0	9.9	9.9
52															11.6	11.5	11.3	11.2	11.1	11.0	10.9	10.8	10.7	10.6	10.5	10.5
53	Contraction of the second		A contraction								and the second second		-		12.4	12.2	12.1	12.0	11.9	11.8	11.6	11.5	11.4	11.3	11.2	11.1
54					A									-	13.2	13.1	13.0	12.8	12.7	12.5	12.4	12.3	12.2	12.1	12.0	11.9
55															14.1	13.9	13.8	13.6	13.5	13.4	13.2	13.1	13.0	12.9	12.8	12.6

• BU = Assembly average burnup

- Use burnup and enrichment to lookup minimum cooling time in years. For fuel assemblies reconstituted with up to 10 stainless steel rods only, if the lookup cooling time is less than 9.0 years then a minimum cooling time of 9.0 years shall be used. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment greater than 4.5 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 5-years cooling.
- Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 46.5 GWd/MTU is acceptable for storage after a 8.3 years cooling time as defined by 3.7 wt. % U-235 (rounding down) and 47 GWd/MTU (rounding up) on the qualification table.
- See Figure 1-8 for a description of zones.
- For assemblies fuel reconstituted with Zircaloy clad uranium-oxide rods use the assembly average enrichment to determine the minimum cooling time.

Table 1-2p

PWR Fuel Qualification Table for Zone 3 with 1.3 kW per Assembly, Fuel with or without BPRAs, for the NUHOMS[®]-24PHB DSC

(Minimum required years of cooling time after reactor core discharge)

BU									A	sseml	oly Av	erage	Initial	U-235	5 Enric	hment	t (wt %	6)								
(GWd/MTU)	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5
10	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	-5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
15	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
- 20	5.0	5.0	5.0	5.0 ⁻	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
25	-	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
28		a factor from a	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	-5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
30	[5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
32							5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
34								5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	·5.0	5.0
- 36 ·									5.0	5.0	-5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
38											5.5	5.5	5.5	5,5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
39											5.5	5.5	5.5	5.5	5.5	5.5	5,5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
40		and the state					2 .				5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
41											5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
42											6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
43											6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
44											6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
45			No	t An	alyz	zed							6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
46						The start of start			and south a				6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
47													6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
48													6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
49													6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6:5
50															6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
51							- A 1								6.7	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
52 .		and a de liter	line and the state of the	Andrea Alizzaian			1		and a start of		للتبالينيث ملم		i an i an tin t). 	7.0	6.9	6.9	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
53							ىرىنىيەر ئىلىسى مەر	<u> </u>	<u></u>	<u></u>				, 1	73	72	72	71	71	7.0	69	69	69	69	69	69
54			<u> </u>		an trans			haring de	-				(77	7.6	75	7.4	7.4	73	73	7.2	71	71	7.0	7.0
54	•		<u> </u>									1 <u>.</u>	1. m. m	· · · · · · · · · · · · · · · · · · ·	1.1	1.0	7.5	7.4	7.4	1.5	7.5	7.2	7.1	7.1	7.0	7.0
>>															8.0	8.0	7.9 -	1.8	1.1	1.1	1.0	1.5	1.5	/.4	1.5	1.5

- BU = Assembly average burnup
- Use burnup and enrichment to lookup minimum cooling time in years. For fuel assemblies reconstituted with up to 10 stainless steel rods only, if the lookup cooling time is less than 9.0 years then a minimum cooling time of 9.0 years shall be used. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment greater than 4.5 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 5-years cooling.
- Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 46.5 GWd/MTU is acceptable for storage after a 6.2 years cooling time as defined by 3.7 wt. % U-235 (rounding down) and 47 GWd/MTU (rounding up) on the qualification table.
- See Figure 1-8 and 1-9 for a description of zones.

• For fuel assemblies reconstituted with Zircaloy clad uranium-oxide rods use the assembly average enrichment to determine the minimum cooling time.



Table 1-2qBWR Fuel Qualification Table for NUHOMS[®]-61BT DSC

BU	Initial Enrichment																														
(GWd /MTU	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4
10	4	4	4	4	4	4	4	4	4	4	4	4	4	4	_4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
15	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
20	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
25	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4
28					6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5
30					7	7	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
32	No	+ 1 00	ontol		8	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	6
34	110	LACC	eptat 	пе	9	9	9	9	9	9	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7	7
36	N	nt A n	1 11/70	d	11	11	11	10	10	10	10	10	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8
38			ary 20	u	14	13	13	12	12	12	12	11	11	11	11	11	10	10	10	10	10	10	9	9	9	9	9	9	9	9	9
39					15	14	14	14	13	13	13	12	12	12	12	11	11	11	11	11	10	10	10	10	10	10	10	9	9	9	9
40					16	16	15	15	15	14	14	14	13	13	13	12	12	12	12	12	11	11	11	11	11	10	10	10	10	10	10

(Minimum required years of cooling time after reactor core discharge)

This Table provides an alternate methodology as cross referenced in Table 1-1c and 1-1j for determination of fuel assemblies qualified for storage in NUHOMS[®]-61BT DSC.

- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are conservatively applied in determination of actual values for these two parameters.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment less than 1.4 and greater than 4.4 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 40 GWd/MTU is unacceptable for storage.
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 4 years cooling.
- Example: An assembly with an initial enrichment of 3.75 wt. % U-235 and a burnup of 39.5 GWd/MTU is acceptable for storage after a eleven-year cooling time as defined by 3.7 wt. % U-235 (rounding down) and 40 GWd/MTU (rounding up) on the qualification table.

Table 1-3a

PWR Fuel Qualification Table for Zone 1 Fuel with 1.7 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/o CCs)

(N	Ainimum	required	vears of	cooling	time af	fter reactor	core discharge)

Burn	Maximum Assembly Average Init														tial	U-2	35 I	Enri	chn	nent	, wt	. %											
GWD/ MTU	0.7 1.5 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4														3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0			
10	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0														3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
15	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0														3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
20	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0															3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
25		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28	•	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32		3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
34		3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
36	4.0 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5															3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
38	4.5 4.0 4.0 3.5 <th>3.5</th> <th>3.5</th> <th>3.5</th> <th>3.5</th> <th>3.5</th> <th>3.5</th> <th>3.5</th> <th>3.5</th> <th>3.5</th> <th>3.0</th> <th>3.0</th> <th>3.0</th> <th>3.0</th> <th>3.0</th> <th>3.0</th> <th>3.0</th> <th>3.0</th>															3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
39	4.5 4.0 4.0 4.0 3.5 <th>3.5</th>															3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
40	4.5 4.0 4.0 4.0 4.0 4.0 3.5 <th>3.5</th>														3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		
41	5.0 4.5 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0														3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		
42	интипинаналарты установали интипинализация интипинализация интипинализация интипинализация интипинализация инт															4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
43															4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		
44	ittentitinia	angetaar	2010meters	udintiitas	rationag	raranzaqu	ynatuttota	annanna	mmeetin	4.0	4.0	4.0	4.0	4.0	•4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
45	ay gan a	urtro-tation:	Manager and	angalisted	1000Baula	naganana	manandaana	nummer	Tilluralda,	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
46	ditalisterne	annnunua:	narananan	useumen	າງການສາມານ	onnandus)	00000000000000000000000000000000000000	BHIODEBHI	anananana.	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
47	1. Caranananananananananananananananananana	nannmuun	namana	monum	1900.000000	លពីបទដែលជំន	DIVERSION	mpununa	nutamaa	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	ntomprom	nanatingua	nayaana	กษณ์และเมษา	normana ana ang ang ang ang ang ang ang ang	muunmuu				5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0
49	Juguathan	nationalise	nopanum	antifiction antifiction	manamp	and support	anno ann i	ក្នុងបុរសារ		and and a	ang	enuun man	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
50	10000000		innun on one		nonnanta	maaamaa			nano antesa		mpunat		5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
	Statema	natorinan	manhan	in a substant				mananan	agamin'n	anatatana a		wann cara	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
52															5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5		
53															5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		
54	5.5 5.5 5														5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		
55	Note: If <i>irradiated</i> stainless steel rods are														5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0		
56	present in the <i>reconstituted</i> fuel assembly, $\frac{6.0 \ 6.0 \ 6}{2}$														6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0		
57	- add an additional year of cooling time.													6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5			
58														6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5			
59														6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5			
60														6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0			
61	7.													7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0			
62			. Court					6						1			7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5

Note: Page A-71 provides the explanatory notes and limitations regarding the use of this table.
Table 1-3b

PWR Fuel Qualification Table for Zone 2 Fuel with 2.0 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/o CCs)

Burn						(11)			Ma	ximi	um /	Ass	eml		Ave	ade	e Ini	tial	U-2	35 1	Enri	chm	ient	. wt	. %	<u> </u>	/						
Up, GWD/ MTU	0.7	1.5	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3:0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
34		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
36		3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
38		3.5	.5 3.5 3.0 3.															3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
39	•	3.5	5 3.5 3.5 3.5 3.5 3.6 3.0															3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
40		4.0	5 3.5 3.5 3.5 3.6 3.0														3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
41		4.0	5 3.5 3.5 3.5 3.6 3.0														3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
42	15/01001077	17127013 (211 77	fntlere en set	1	mintere	an manager and an		Rubrotow	1101100.005	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
43	- Martin Dalla									3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0
44						OD TIME TO T				3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
45	manumun						morthann		onionene	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
46			nanmana	ann eo ni ena			duction	methorin	morran	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
47	1011000000000	antitana	mmmmm		nutuntuiti		Dutantaat	diman and	attana	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
48										4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
49	intransul		autowata	antoniania			เป็นเสรณสะ	milimite		hlinovetse		1201000000	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5
50	tummusuu		and a constant			ninnuninu	mana			1000000000		Antimasia	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
51	the officer of t		manum		off her frei Dabeite		mmmmmmm	and	mmitunting	momme		mmanka	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
52	ameterrate			Rollin march				March March 197					•	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
53	anarrow								0.00000000					4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
54													<i></i>		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0
55		No	ta.	Ifiz	rad	iata	deta	inla	ee et	، امم	ode	250			5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
56			nc. Icon	11 // t in :	the i	raco	i sta victii	inte:	33 31 1 fi 10	lac	ous	arc blv			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5
57			d an	uni add	litio	nola	16011 1601	ofc	e nuc ooli	n as na ti	ima	Juy,					5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
58		au	u an	auu	nuo	iai y	Cal	ore	001	ng ti	mię.						5.0	5.0	5.0	5.0	5.0	5.0	5:.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
59						1										a	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
60																	6.0	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
61																	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
62											•						6.0	5.5	5.5	.5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5

(Minimum required years of cooling time after reactor core discharge)

Table 1-3c

PWR Fuel Qualification Table for Zone 3 Fuel with 1.5 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/o CCs)

(Minimum	required	vears of	cooling	time after	reactor core	discharge)
1	, ivininiuni	required	<i>y</i> c ars or	cooming	time arter		uisenaige

Burn									Ma	xim	um	Ass	emb	oly /	٩ve	rage	e Ini	tial	U-2	35 I	Enri	chm	nent	i, wt	. %								
GWD/	0.7	1.5	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28	1	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30		3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32		4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
34		4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
36	al Maria	4.5	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
38		5.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
39		5.0 4.5 4.5 4.5 4.5 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0															4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
40		5.5 4.5 4.5 4.5 4.5 4.5 4.5 4.6 4.0 <th>4.0</th> <th>3.5</th>															4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	
41	l	5.5	5.5 4.5 4.5 4.5 4.5 4.6 4.0 4															4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
42	maaaaa	ionouniro	5.5 4.5 4.5 4.5 4.5 4.5 4.5 4.0 <th>4.0</th>															4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
43	annoonn	anna anna anna anna anna anna anna ann	nommana	manetaan	awaanno	unimunn	unun ann	4.Runniilistest	1000 daaloo	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
44	azranatu	allain Surre	nunnaaaaa	maatan	ananan kanan	Muanzopa	Etanpanta	ntapangalapa	thuncound	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0
45	are dand	utaatiinaa	mmununun	nada ista	ennonne	nutranna	gauge and the	n _{torminos}	beuntore c	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
46	átputta un		nutriinii ini	manaka	an a	D omanuta	ntificium antificium	(Budulupy		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
47	suunnun	amonumo	annnyme) u	ուրադրո	inorganane	sm <u>m</u> ac:	grauphanga	manna	រាណាជារដ្ឋា	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
48	utangon	mpostana		oinninna:	etteannace					5.5	3.3	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5
49	เล่ามีเมือง	11111111111111	10005011115	າດເຫັນເຫັນເລ	ໄດ້ເອົາມູ້ການແຫຼ	ntimanun	ուրոնդրունյու	nu nn udu	រល្បារព្រះពេវាញ 	1000001111	hunganan t	anun mu	3.3	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
50	una nuna	ainnainin	aenter (p	- doubandura	Maratambi		an a	mommin	najam an u	meenon	าสองหมาย	annanisti	3.3	3.3	3.3	3.3	5.5	5.5	5.5	5.5	3.3	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
51	ເຫຍາກແຫຼ	antaisennen	10011-022000	tunonidan	anaannoan		01000000000	manamı	uinooona	1979-1971 1971	nnes no carran	ພາກທານນ	0.0	6.0	6.0	0.0	5.5 6 0	5.5	5.5	5.5	5.5	5.5	5.5	5.5).) 5 5	5.5	5.5 5.5	5.5	5.5	5.5	5.0	5.0	5.0
53	hiumpona	uninteruter	d.hanovaran	an manu		NULUURA.	12027003102		tandigi, Mana		annarana	icentrumba	aanaanne	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	3.3 6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
54		unsample Internet	ageneration of		afondendise Afondendise		nauthaut	nunntaa	Raidha nsi a	udire/man/i	Aflingeright	and the second second	tioinintan .	0.0	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	0.0 6.0	5.5	5.5	5.5	5.5	<u>5.5</u> 6.0	5.5	5.5	5.5
55	5	<u></u>	No			- <u>6</u> M.c.ct	-		ala da sel "The test of		• 2		un al al al an		65	65	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
56		Nc	ote:	If ir	radı	iatec	d sta	inle	ss st	eelı	ods	are			7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	65	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0
57		pre	esent	t in i	the <i>i</i>	·eco	nstit	tuted	d fue	el as	sem	bly,			1.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	65	6.5	6.5	6.5	65	65	6.5	6.5	6.5
58		ade	d an	add	itioi	nal y	/ear	ofc	ooli	ng t	ime.		•				7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5
59	1 · · ·	<u> </u>															7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	7.0
60			in ann a' a		na Dagame		27 <i>phazon</i> 0					900 manu				98267785	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0
61			, and and and a	antan series	antartaryan an		nuuuunaan		229.00,000.000	1995.09 MB		namion ui			710.2M8424		8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
62																	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5

Table 1-3d

PWR Fuel Qualification Table for Zone 4 Fuel with 1.3 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/o CCs)

Minimum re	equired	vears o	f cooling	time after	reactor	core dischar	rge)

Burn									Ma	xim	um	Ass	emł	oly /	Ave	rage	e Ini	tial	U-2	35 I	Enri	chm	nent	i, wt	. %								
GWD/ MTU	0.7	1.5	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	<u>3.3</u>	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28		3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30		4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32		4.5	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
34		4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
36		5.0	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
38		5.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
39		<i>6.0</i>	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
40		6.0	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
41		6.5 5.5 5.5 5.0 <td>4.5</td>															4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
42	3.00000000000	0.5 5.5 5.0 <td>5.0</td> <td>5.0</td> <td>5.0</td> <td>4.5</td>															5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5			
43	Mananasia	5.0 5.0 <th>5.0</th> <th>4.5</th> <th>4.5</th> <th>4.5</th> <th>4.5</th>															5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5			
44	anoquagu	umperiges	trugentyre	nationata	uuuninuu	nananan	unnunge		memper	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
45	torinited to b	antratana a	tan waa ayaa		unanataa.	manan	anninante	unanana	Ministature	<u>5.5</u>	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
46	anaam	2600700000	manna	a and the second se	hDinimat	mpunum		tere de la constant	angalari	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0
47	antruction	portractula	amaman	nininina n	Manana	անուրեննո	daaqtaaragta	nomata	որորութ	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
48	dignmont b	manana	nonnouz	naoa a haho	annanan				1	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
49	nnimenu	umananan ang ang ang ang ang ang ang ang a		uunaaa		minum		այաշտատ	1990-1990-1990-1990-1990-1990-1990-1990	nio sugarana	umana	ntananna in	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5
50	unnomuu	ուսուս	ուրայուս	nnjo adžađ	hukulikast		usummuni		200000000000000	mainnaga	inana sa	លោកមាន	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
51	mannanan	unalunua	unnnanta	4470000000	ແຫຼງເຫຼັງເຫຼັງ	normanit		doom co too	anapaseran		ann an	an quadane	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0
52	TRADADADE	anamoon.			הייינטנטייה		ana ana ana ang ang ang ang ang ang ang		ondramatica.	manna	ana	100.00000	ana ang ang ang ang ang ang ang ang ang	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6:5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
53	an a			91 2 12232000			01.070.071.071	apatan ng m	2 22 3444010-	angeopore	ารมารายุสมา	-Linanaamyo	atoannaa	1.3	1.3	/.3	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5
- 54		NR.7 11. 1	- Mail-Og-0	1969 <u>a</u> 10 //	<u>d an an</u>							A.X.	t. 1.t.		8.0	8.0	8.0	1.5	1.5	1.5	7.5	1.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
55		No	te:	lf ir	radi	iatec	/ sta	inle	ss st	eel 1	ods	are			8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0
56		pre	sent	in t	he r	eco	nstit	utec	l fue	l as	seml	bly,			8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	1.5	1.5	7.5	1.5	7.5	7.5
5/		ado	i an	add	itior	nal y	/ear	ofc	ooli	ng ti	ime	for					9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
58		coc	oling	, tin	nes l	ess	than	10	year	s.							9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0
59													,				10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5
60	-(#10,00000000000000000000000000000000000	the second s				an taran dag		alaroari	.	91270200000	anna bha an	Crokelake	<u>pirman</u> na	uridon di g		hatmantik	10.5	10.5	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0
61		ananan an			12270-023	ughton	erranger	tauctur dy	ana		un Pristant		maninanga		ngunanas.		11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5
62																	11.5	11.5	11.5	11.5	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.5	[10.0]	10.0	10.0	10.0	10.0

Table 1-3e PWR Fuel Qualification Table for Zone 1 Fuel with 1.7 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/ CCs)

(Minimum required years of cooling time after re	eactor core discharge)

Burn									Ma	xim	um	Ass	eml	oly /	Ave	rage	e Ini	tial	U-2	35 I	Enri	chm	nent	; w t	. %								
GWD/ MTU	0.7	1.5	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28	·	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32		3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
34		3.5	3.5	3.5	3.5	3.0	3.0	3:0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
36		4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
38		4.5	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0
39		4.5	5 4.0 4.0 4.0 3.5															3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
40		4.5	5 4.0 4.0 4.0 4.0 4.0 4.0 3.5															3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
41		4.5 4.0 4.0 4.0 4.0 4.0 3.5 <td>3.5</td>															3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
42	ununustruud	5.0 4.5 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 3.5 3.5 3.5 4.0 <															4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		
43	(truncing the second	and the second	applications	nandrana	nimentine	uronuncup	anan an	an a	Fandthuilt I.	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5
44	anata ana	manteran	and the second	agoagoag	ungsannterne	nanciptit	uncontro inte	aaneraa	annanaean	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
45	an dama sa	annacant.	esterneour	na popula	neuranour.	ununatira.	rianounour	nanaaa	mannour	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
46	ննենայիսո	1277811216AN	יניינינניניניני		muuttim	monpung	hteenineest	na sa	samunn	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
47	manupa	nnanan	illinetenin).	ningenten	51gun701111	aninakang	innin Dissaa	nangangan	e matanae	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
48		uncontadora	ស្វារាណាដែល	Constantion	ստուսաց,					5.0	3.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0
49	hamming	Cinut	pannanan	0.0000000000000000000000000000000000000	ntountilipit	ummente.	ជួយពីលាអាវិក	minumhar	ampoun	aaronte	ampenia	900.0 0 07401	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
50	annian aa	un danaar	ningeneer	ana	יימממחוווי	ann an an an	, mananan	លាលរកសារ	19111111111111111111111111111111111111	mmuuni		ത്തപിശേഖ്യ	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
51	ារពេរដែលលើ	an a	, and a substantia	րոսըըոս	ang ng n		an a	an a	aranutaran	הותמתונית	1011 0110000	an init utio	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
52 53	, mmananin	Reinflations	สมรรณสำหาร	joto u avez	anver af the	ministra		ພາຍຄາມາກ	Alimination		utprearant	ninganio.	unangena,	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.3	4.5	4.5
54	aluzionada		1991-1991-1997			anianuuraa	6.maannaa						7D CLARK CONTRACT	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
55		···· ·· ·	,		•	14.7 W HL 1		*** *							55	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
56		No	te:	If ir	radi	iatec	d sta	inle	ss st	eel	ods	are			60	60	6.0	6.0	6.0	55	55	55	55	55	55	5.5	5.5	5.5	5.5	5.5	55	5.5	5.5
57		pre	sent	t in t	the <i>i</i>	·eco	nstit	utec	d fue	el as	sem	bly,			L		6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	55	5.5	5.5	5.5	5.5	5.5	5.5	5.5
58		ado	d an	add	itio	ial y	/ear	ofc	ooli	ng t	ime.						6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	60	6.0	6.0	60	5.5	5.5	55	5.5	5.5
59		· · ·															6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
60		anton (119).				rt.1.02	974aan1944aa	ogan ganta	07141 <u>9</u> 2727		**********	noter and	1.29000-0		randi gatany		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
61				<u> </u>	40000-00000	Matanada.	Dodina Bars		*****			ye mawt		e <u>in ter</u> felore	aliyya di saga	tenstrational	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0
62		1999.00945 1999.00945				utali ti susti	inter souther, s			apresetta	111111111123	alan alan da				ta norman pa	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
~~																												L	1	<u> </u>	L	1	0.0

Table 1-3f PWR Fuel Qualification Table for Zone 2 Fuel with 2.0 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/ CCs)

(Minimum required	years of cooling time after	reactor core discharge)
		5

Burn									Ma	xim	um	Ass	emt	oly /	Ave	rage	e Ini	tial	U-2	35 I	Enri	chm	nent	, wt	. %								
GWD/	0.7	1.5	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
MTU				• •																													
10	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32	-	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
34		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
36		3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
38		3.3	3.5	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
39		3.3	3.5	3.5	3.3	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	$\frac{3.0}{2.0}$	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
40		4.0 3.5 3.5 3.5 3.5 3.5 3.6 3.0 3															3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
41		4.0 3.5 <th>3.0</th>															3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
42	tanonaman	4.0 3.5 <th>3.5</th> <th>3.5</th> <th>3.5</th> <th>3.0</th>															3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
43	nmgangad	anumageneration 3.5															3.3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0		
44	Contractions	1/1/// /// 1/10	utativa (Can	ang to a factor of the factor	ផលប្រជាសាស	an nanan n		upconan	mundhim).	3.5	3.5	2.5	2.5	3.5	3.5	3.5	3.5	3.5	3.3	2.5	3.5	3.5	3.5	3.5	3.3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.3
45	rentes appression in the	onstander	manaattar	annan ann an	nnonoine de	dan <u>anan</u> a	teranan sana sana sana sana sana sana sana	alianaadu	aaataa ta	4.0	5.5	3.5	5.5	3.5	3.5	3.5	2.5	3.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.5	3.3
40	ការប្រយោ	10141010303	1001 00300300	משמממים	100000/01000		านสองทุกเต	ານເກັນເປັນມາ		4.0	4.0	4.0	4.0	4.0	4.0	J.J 4.0	3.J 4.0	3.5 4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
47	mpuma	unite o tri ante	uina farra	սուսուրյուն	ուրոները	anno Minun	նարդչարըը	វាចំបូណវិវត្តល	annongo	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	10	10	<u> </u>	<i>3.3</i> <i>4</i> 0	J.J 4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
40	avannana	uuunsamo	nunnenn t	Մպոուտնես	enninista (n	anter at at	(p.anipidio	in an	าหมริงแก้เด	4.0	7.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5
50	ta an an	BERGINGUNU.		mundulud	1011111111111111		արտարար	ส์ฉองชมอง	an a	nniteritere	ungan ar	ufuntion tu	4.0	4.0	4.0	4.0	4.0	4.0	4.0	$\frac{4.0}{4.0}$	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
51	Paratura (2003		ដំ លោក ទោះពេល	11]15mi)1001	BUILDING TO THE O	manatana	ապոորքաղ	uninninun (and constraint	a a rinana d	ເປັນນີ້ມີແມ່ນນະ	45	45	45	45	4 5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
52	00000000000000000000000000000000000000	nonon a anna	angen ma	ninterrenti:	nnaan an a	an a	Contraction of the second s		שונחוםיוסי		ananan an	ະໝາຍການເ		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
53	SULTIMET II	ennistanne Samin	ເອາສະຫຼາດເຮົາ		atronana ar	annonanah	angan dina dina dina dina dina dina dina di	ann 1994)		mananas taj	anen anen anen	ann an	and and a second se	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
54	throu all agents	งมระหมู่มาสด	ndipus ana e	a a maanaa	anna anna	ALL CONTRACTOR			mananan	na ngeri na	anninan	Anadoration	anoindon-		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0
55		<u>ан н эн</u>			,	• ,		• •	<u> </u>	1	1				5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
56		NO	te:	If <i>ir</i>	radi	atec	1 sta	inle	ss st		ods	are			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5
57		pre	sen	i in i	the <i>i</i>	reco	nstil	utec		as:	sem	biy,					5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
58		ado	i an	add	101	hal y	/ear	orc	0010	ng ti	ime.						5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
59		L															5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
60	200000000	anayo)yoga	a comprote	al all lines of the lines of th	Second Anti-		entalium).			1999-1993 1999-1993 1999-1993	. and the second	19,707000009					6.0	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
61				20100020	nuanausa			1920 Co. 201	na state i tran			ntarat men	ocupation of				6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
62			9 000 (1997)					(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	1/20/100 2/10	20 1 22232			17-13-107-107				6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5

 Table 1-3g

 PWR Fuel Qualification Table for Zone 3 Fuel with 1.5 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/ CCs)

	-	v	
(Minimum required y	ears of cooling tim	ne after reactor core c	lischarge)

Burn									Ma	xim	um	Ass	eml	oly /	Ave	age	e Ini	tial	U-2	35 I	Enri	chm	nent	, wt	. %								
GWD/	0.7	1.5	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
MTU				• •																	· ·												<u></u>
10	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	30	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	$\frac{3.0}{2.0}$	3.0	3.0	$\frac{3.0}{2.0}$	3.0	$\frac{3.0}{2.0}$	3.0	3.0	3.0	3.0	3.0	$\frac{3.0}{2.0}$
20	5.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25		2.5	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0
28		2.5	2.5	2.0	2.0	2.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30		5.5	3.5	3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0	3.0 2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
24		4.0	10	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0
26		4.0	4.0	J.J 1 0	3.5	10	10	5.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.5	3.5	3.5	3.5	3.5	3.5	3.0	2.5	3.0	2.5	3.0	2.5	2.5	2.5	2.5	3.0	2.5
30		50	4.0	4.0	4.0	4.0	4.0	4.0	10	10	10	10	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
30		5.0	4 5	4.5	4.0	45	4.0	4.0	40	4.0	4.0	40	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	35	35	3.5	3.5	3.5	3.5	3.5
40		5.5	45	45	4.5	4.5	45	45	45	4.0	40	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
41		5.5	$\frac{5}{5.0} \frac{7.5}{5.0} \frac{7.5}{4.5} \frac{7.5}$														4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
42		0.0	.5 5.0 5.0 4.5 4.5 4.5 4.5 4.0															4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
43	timanura 1	and month to be	S S.U S.U 4.5 4.5 4.5 4.5 4.6 4.0															4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
44	tippinnseten	aurannalia.	####################################														4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	
45	attuentate	nuinaillon a:	10111091000	sangaran:	ulturanan	en norden en e	and and a second se	agiösthunu	annallanan.	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
46	(falifiare)	194910100000	agaateerine	Gradeware	0000-00-00	anneede -	alla allannin	10.00000000	uctor	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
47	nunanut	100000000000000000000000000000000000000	15 millionit	100100000000000000000000000000000000000	82014000	លោងរបាវព	unno fais	511313199991	9999900 BUD	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5
48	immini			u mmuno	1999.000		alamitra int	1000 mm	Panmamon	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
49	internette	muanatut	0010134662	antonicuru	ofuramuti	,				•	•		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
50	and a second	10100101000	annanaann	omugnesni	Discontinuit	10001112411111		anwanite	a suburburburburburburburburburburburburbur	nini (b) (ini	and		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
51	panningun	THE HEAT		in management		atorenun			50.00000000			iostatricitus	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0
52	- manufacture		damata siste											6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
53			-	, 1	tertruer						trickerste			6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
54					- 										6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5
55		No	te	If ir	rad	inte	d eta	inla	ce et	ا امم	rade	are			6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
56	• •	nre	ecent	tin	the i	raco	n sta netit	hita	ss si 1 fire	et ac	cem	hlv			7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0
57		pro ada	d an	nn 1 add	litio	nal x	nom Jear	of	a nuc Anti	n as na ti	ime	ury,					7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
58				auu			rui			ing t	me.				,		7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5
59	typpoterty										wy prostance				: ·		7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
60					-												8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0
61														vannaaraa			8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
62														1			9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5

Table 1-3h

PWR Fuel Qualification Table for Zone 4 Fuel with 1.3 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/ CCs)

(Minimum required years of cooling time after reactor core discharge)

Burn									Ma	xim	um	Ass	emł	oly A	Ave	rage	e Ini	tial	U-2	35 I	Enri	chm	nent	, wt	. %								
GWD/ MTU	0.7	1.5	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28		3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3:0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30		4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32		4.5	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
34		4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
36		5.0	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
38		5.5	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
39		6.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
40		6.0	u s.s s.u s.u															4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
41		6.5 5.5 5.5 5.0 <th>4.5</th>															4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
42	uumpuun	0.5 3.5 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 4.5 4.5 maximum contraction of the contraction o															5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		
43	inmann a	5.0 5.0 <th>5.0</th> <th>4.5</th> <th>4.5</th>															5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	
44	antassitaino	agonana.	maggingung	titternetter	annonnann.	onillipidat	10220ndany	ennon and an	upintugiyan.	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
45	aranna	amindazota	Remand	Will Caracher	anuminilina.	mananan.	<i>សាលែបារ</i> ពេល	ann containea	aangproup.	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
. 46	daanumas	пользичите саличает наличие на наличие на Наличие на наличие на на															5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	
47	nationation	រពារបារភិរោង	յուսույլ	popeon@s(m	Qualitation	monum	nnovannin	tuandah	Nagagana	6.0	6.0	6.0	0.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
48	ann manan	ojinii timp t	1005111000	nng num	munur					6.5	6.5	0.3	6.5	0.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
49	amatamo	untransia	na kana ana ana ana ana ana ana ana ana	maammuu	minumur.	alianaa da	natuminiau	mmaqant	amuterium	ortunnaar	mussum	NIDHILLIOI	0.3	0.5	6.5	6.5	$\frac{6.5}{6.5}$	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
50	1.0771100000	an a	1949 (2010) 2011	nta man	aagaaanati	Burrinne	ann mugan	manne	ជាអពលេងអង្គរ	and a state of the s	mathant	vananaa	7.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51	រណារាជាលោកប្	ดที่ขางสนเสม	ta data da	lana sa din tana	- Annominau	munum	and so the	noondagend		2000000000	សារជាការក	po ndifili no	7.0	7.0	7.0	7.0	7.0	7.0	7.0	0.5	0.5	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0
52	3213939299		nistering and		<u>19112111999</u> 2	essonna	aptaoona	annind as sao	สารรักเสราสม	an a	ana an	aan ar ah	innations	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	0.5	7.0	7.0	7.0	7.0	6.5	6.5
54	anananan		an a		an a	909997-ANU	annan ann	39002926		anasonita a		10040300	uonennon.	1.5	80	80	80	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0
55				~			<u></u>						ta de cala de las		85	8.0	8.0	8.0	8.0	8.0	80	8.0	80	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0
56		No	te:	If ir	radi	iatec	d sta	inle	ss st	eel	rods	are			85	85	8.5	85	8.5	85	85	8.0	8.0	80	8.0	8.0	8.0	8.0	7.5	75	7.5	7.5	7.5
57		pre	esen	t in	the <i>i</i>	reco	nstii	tuted	d fue	el as	sem	bly,				0.5	9.0	9.0	9.0	85	85	8 5	85	85	85	8.5	8.0	8.0	8.0	80	8.0	8.0	8.0
58		ado	d an	add	litio	nal y	/ear	ofc	ooli	ng t	ime	for		l			9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0
59		coo	oling	g tin	nes l	ess	than	10	year	ſS.							10.0	10.0	9.5	10.0	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5
60														I .			10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0
61	arnin ontra		k generations						nounned	riverneter	n <u>av</u> jella sad	u vinesait	tornanan -	indugatikut	194 9. 487122	w.compi	11.0	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5
62	ins ta rang								•••••••••••• •				น้ำแนนเหน	lan an a			12.0	11.5	11.5	11.5	11.5	11.0	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0

Notes: Tables 1-3a through 1-3h:

- Burnup = Assembly Average burnup.
- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an assembly average initial enrichment less than 0.7 wt. % U-235 (or less than the minimum provided above for each burnup) and greater than 5.0 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 62 GWd/MTU is unacceptable for storage.
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 3-years cooling.
- WE 15x15 PLSAs shall be limited to a minimum assembly average initial enrichment of 1.2 wt. % U-235.
- See Figures 1-11 through 1-15 for the description of zones.
- For *reconstituted* fuel assemblies with UO_2 rods *and/or Zr rods or Zr pellets and/or stainless steel rods*, use the assembly average equivalent enrichment to determine the minimum cooling time.
- The cooling times for damaged and intact assemblies are identical.
- *Example*: An intact fuel assembly without CCs, with a decay heat load of 1.7 kW or less, an initial enrichment of 3.65 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a 4.0 year cooling time as defined by 3.6 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) in Table 1-3a.



 Table 1-4a

 BWR Fuel Qualification Table for Zone 1 Fuel with 0.22 kW per Assembly for the NUHOMS[®]-61BTH DSC

(Minimum required years of cooling time after reactor core discharge)

Burn-													Lati	lice A	lvera	ige Ir	nitial	U-23	5 En	richn	nent,	wt %	5										,	
Up, GWD/ MTU	D ⁷ 0.9 1.2 1.5 2.0 2.1 2.2 2.3 2.4 2.5 2												2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	30	3.0	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
15	4.0	40	40	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
20	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
23	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
25	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
28	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
30	10.5	10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
32				11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.05	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	10.0	10.0
34				14.0	14.0	14.0	14.0	14.0	14.0	14.0	13.0	13.0	13.0	13.0	13.0	13.0	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
36				16.5	16.0	16.0	16.0	16.0	16.0	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.5	14.5	14.5	14.5
38				19.5	19.0	19.0	19.0	19.0	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.0	18.0	18.0	18.0	18.0	18.0	18.0	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
39				21.0	21.0	20.5	20.5	20.5	20.5	20.5	20.5	20.0	20.0	20.0	20.0	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
40										22.0	21.5	21.5	21.5	21.5	21.5	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
41								÷		23.5	23.5	23.0	23.0	23.0	23.0	23.0	22.5	22.5	22.5	22.5	22.5	22.5	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	21.5
42	1.15			÷.,						24.5	24.5	24.5	24.5	24.5	24.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.05	24.0	24.0	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5
43			N	ot A	Ana	lyze	ed .			26.0	26.0	26.0	26.0	26.0	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	24.5
44										27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	26.5	26.5	26.5	26.5	26.5	26.0	26.5	26.0	26.0	26.0
45	1									29.0	29.0	29.0	29.0	29.0	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.5	28.0	28.0	28.0	28.0	28.0	27.5	27.5	27.5	27.5	27.5	27.5
46		lf 1	0 irra	adiate	ed st	ainle	ss st	eel		30.5	30.5	30.5	30.5	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.5	29.0	29.0	29.0
47		rod	s are	pre.	sent	in th	e .	00/		31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	30.5	30.5	30.5	30.5	30.5	30.5
48		rec	onsti	itutec	d fuei	l ass	embl	у,		33.0	33.0	33.0	33.0	33.0	33.0	33.0	33.0	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.0	32.0	32.0	32.0	32.0	32.0	32.0
49		ado	d an i	addil	ionai	15.0	year	s of		34.5	34.5	34.5	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.0	33.0	33.0	33.0
50		coc	oling	time.						36.0	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.0	35.0	35.0	35.0	35.0	35.0	35.0	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
51										37.0	37.0	37.0	37.0	37.0	37.0	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
52										38.5	38.0	38.0	38.0	38.0	38.0	38.0	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.0
53	1.1									39.5	39.5	39.5	39.5	39.5	39.5	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.5	39.0	38.5	38.5	38.5
54										41.0	41.0	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	39.5
55									:	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.0	41.0	41.0	41.0	41.0
56										43.0	43.0	43.0	43.0	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5
57	, i									44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5	43.5
58										45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	44.5	44.5	44.5	44.5
59										46.0	46.0	46.0	46.0	46.0	46.5	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.5	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	46.0	45.5
60					,	-				47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0
61										48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.5	48.0	48.0	48.0	48.0
62										49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5



Table 1-4bBWR Fuel Qualification Table for Zone 2 Fuel with 0.35 kW per Assembly for the NUHOMS®-61BTH DSC

(Minimum required years of cooling time after reactor core discharge)

Burn-													Latt	ice A	lvera	ge In	itial	U-23	5 Eni	richn	nent,	wt %	ó											
Up, GWD/ MTU	0.9	1.2	1.5	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
23	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
25	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
28	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
30	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	.5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
32			6.0	5.5	5.5 _.	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
34		-	, ,	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
36			100	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
38				7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
39				7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
40			-							7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
41										8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
42										8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
43	Ľ.		N	ot A	Ana	lyze	èd 🛛			9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0
44										9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5
45	Ι.									10.5	10.5	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
46		lf 1	0 irra	diate	ed st	ainle	ss st	eel		11.0	11.0	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5
47		rod	s are	pre.	sent	in the	е			12.0	11.5	11.5	11.5	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0
48		rec	onsti	itutec	l fuel	assi	embl	у,		12.5	12.5	12.5	12.5	12.5	12.5	12.0	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.0	10.5	10.5	10.5
49		ado	l an a	addit	ional	5.0	years	s of		13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.0	12.0	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
50		coc	oling	time.						14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.5	12.5	12.5	12.0	12.0	12.0	12.0
51	1.									15.5	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	13.0	13.0	13.0	13.0	13.0	13.0
52	1									16.5	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
53	1		`							17.5	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	15.0	15.0
54		-								18.5	18.5	18.0	18.0	18.0	18.0	18.0	18.0	18.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.0	16.0	16.0	16.0	16.0	16.0
55							·· •		1	20.5	20.5	19.0	19.0	19.0	19.0	19.0	19.0	19.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	17.0	17.0	17.0	17.0	17.0	17.0
56										21.5	21.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
57										22.5	22.5	22.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.0	19.0	19.0	19.0	19.0	19.0
58										22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	20.0	20.0	20.0	20.0
59										23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	21.0	21.0	21.0	21.0
60										24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23:0	23.0	23.0	22.0	22.0	22.0	22.0
61										26.5	26.5	26.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	23.0	23.0	23.0	23.0
62										27.5	27.5	27.5	27.5	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	24.0	24.0



 Table 1-4c

 BWR Fuel Qualification Table for Zone 3 Fuel with 0.393 kW per Assembly for the NUHOMS[®]-61BTH DSC

(*Minimum required years of cooling time after reactor core discharge*)

Burn-													Lati	tice /	lvera	ge In	itial	U-23	5 En	richn	nent,	wt %	ó											
Up, GWD/	0.9	1.2	1.5	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	-3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1 [.]	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
15	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	30	3.0	3.0	3.0	3.0	3.0	3.0	30	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
23	40	40	3.5	35	35	3.5	3.5	3.5	3.5	35	3.0	3.5	35	3.5	3.5	35	3.5	35	35	3.5	35	3.5	30	30	30	30	3.0	30	30	30	30	30	3.0	3.0
25	40	4.0	40	4.0	4.0	40	40	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
28	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
30	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
32				50	50	50	50	50	50	50	50	50	50	50	50	50	45	45	4.5	4.5	45	45	45	45	4.5	45	4.5	45	4.5	4.5	4.5	4.5	4.5	4.5
34	1			55	5.5	5.5	50	50	5.0	50	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	50	50	50	5.0	50	50	5.0	50	50	50	50	50	45	4.5
36	1			6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
38				6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
39	1			6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
40					·	.	• •	•		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
41										7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0
42	1									7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
43			Ν	ot A	Ana	lyze	əd			7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5
44	1					•				8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
45	1									8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0
46		IF 1	∩ irrs	diat	ed st	ainle	ee ef	laal		8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5
47	1	roo	ls are	pre	sent	in th	93 31 9			9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
48	1	rec	onsti	tuteo	d fuel	ass	- embl	<i>y</i> ,		10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
49	1	ado	d an a	addil	lional	5.0	year.	s of		10.5	10.5	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
50	1	coc	oling	time.						11 0	110	11 0	10.5	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	90	90
51	1 '		,							11 5	11 5	11 5	11 5	11 F	110	110	11 0	11.0	11 0	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.5	9.5
52										12.5	12.5	12.0	12.0	120	12 0	12.0	11.5	11.5	11.5	11 0	11 0	11 0	11 0	11 0	11 0	110	11 0	110	10.5	10.5	10.5	10.5	10.5	10.5
53	1									13.5	13.0	13.0	13.0	13.0	12.5	12.5	12.5	12.0	12.0	12.0	12.0	12.0	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.0	11.0	11.0	11.0	11.0
54			ż				•			14.0	14.0	14.0	13.5	13.5	13.5	13.0	13.0	13.0	13.0	13.0	13.0	12.5	12.5	12.5	12.5	12.0	12.0	12.0	12.0	12.0	11.5	11.5	11.5	11.5
55		· · .	- 7							15.0	15.0	14.5	14.5	14.5	14.0	14.0	14.0	14.0	13.5	13.5	13.5	13.5	13.0	13.0	13.0	13.0	13.0	13.0	12.5	12.5	12.5	12.5	12.5	12.0
56	1									16.0	16.0	15.5	15.5	15.5	15.0	15.0	15.0	15.0	15.0	14.5	14.5	14.0	14.0	14.0	14.0	13.5	13.5	13.5	13.5	13.0	13.0	13.0	13.0	13.0
57	1									17.0	16.5	16.5	16.5	16.0	16.0	16.0	15.5	15.5	15.5	15.5	15.5	15.0	15.0	14.5	14.5	14.5	14.5	14.5	14.5	14.0	14.0	14.0	14.0	14.0
58	1									18.0	17.5	17.5	17.5	17.5	17.0	17.0	16.5	16.5	16.5	16.5	16.5	16.0	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.0	15.0	14.5	14.5
59	1									19.5	18.5	18.5	18.0	18.0	18.0	17.5	17.5	17.5	17.5	17.0	17.0	17.0	17.0	16.5	16.5	16.5	16.0	16.0	16.0	16.0	16.0	16.0	15.5	15.5
60										20.0	19.5	19.5	19.5	19.0	19.0	18.5	18.5	18.5	18.5	18.5	18.5	18.0	17.5	17.5	17.5	17.0	17.0	17.0	17.0	17.0	16.5	16.5	16.5	16.5
61		•	<i>X</i> .							20.5	20.5	20.5	20.5	20.5	20.0	19.5	19.5	19.5	19.0	19.0	19.0	18.5	18.5	18.5	18.5	18.5	18.0	18.0	18.0	18.0	17.5	17.5	17.5	17.5
62			1							21.5	21.5	21.0	21.0	21.0	21.0	20.5	20.5	20.5	20.0	20.0	20.0	19.5	19.5	19.5	19.0	19.0	19.0	19.0	19.0	19.0	18.5	18.5	18.5	18.0



Table 1-4d BWR Fuel Qualification Table for Zone 4 Fuel with 0.48 kW per Assembly for the NUHOMS[®]-61BTH DSC

(Minimum required years of cooling time after reactor core discharge)

Burn-Up,	<u> </u>												Lati	tice /	Avera	ge In	itial	U-23	5 En	richn	nent,	wt %	6											
GWD/ MTU	0.9	1.2	1.5	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
23	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
32		n i e		4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5
34		•		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
36		1		5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
38				5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
39		· ·		5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
40 [°]										5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
41										5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
42	·						,			7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
43	ļ		N	ot A	Ana	lyze	€d			7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5
44	1	-								8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
45		-								6.5	6.5	6.0	6.0	6.0	6.0.	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5
46		lf 1	0 irra	diate	d sta	inles	s stee	e/		8.5	8.5	8.5	8.5	8.0	8.0	8.5	8.5	8.5	8.5	8.0	8.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
47		roa	s are onstil	pres	ent II fual	n the asser	mhlv			9.0	9.0	9.0	9.0	8.5	8.5	9.0	9.0	9.0	9.0	8.5	8.5	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
48		ado	d an a	additi	onal	5.0 ve	ears (of		9.5	9.5	9.0	9.0	9.0	9.0	9.5	9.5	9.0	9.0	9.0	9.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5
49		coc	oling t	time.		,			•	10.0	10.0	10.0	9.5	9.5	9.5	10.0	10.0	10.0	9.5	9.5	9.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
50	} '								•	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5
51	1									8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
52	1									8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0
53	I									9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
54		4				· 'i				9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5
55										10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0
56										10.5	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5
57										11.0	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
58										11.5	11.5	11.0	11.0	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0
59										12.0	12.0	12.0	11.5	11.5	11.5	11.0	11.0	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	10.0	9.5	9.5
60										13.0	12.5	12.5	12.5	12.0	12.0	12.0	12.0	11.5	11.5	11.5	11.5	11.5	11.0	11.0	11.0	10:5	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0
61	1	••				1.4				13.5	13.5	13.0	13.0	13.0	12.5	12.5	12.5	12.5	12.0	12.0	12.0	12.0	11.5	11.5	11.5	11.5	11.5	11.0	11.0	11.0	11.0	11.0	11.0	10.5
62		· .								14.0	14.0	14.0	14.0	13.5	13.5	13.0	13.0	13.0	12.5	12.5	12.5	12.5	12.5	12.0	12.0	12.0	12.0	12.0	11.5	11.5	11.5	11.5	11.0	11.0



Table 1-4eBWR Fuel Qualification Table for Zone 5 Fuel with 0.54 kW per Assembly for the NUHOMS®-61BTH DSC

Burn-Up,				Lat	tice A	vera	ge In	itial	U-23	5 Eni	richn	ient,	wt %												
GWD/	09 12 15 20 21 22 23 24 25	26	27 2	8 20	30	31	32	33	34	35	3.6	37	3.8	30	40	41	42	4 2	4 4	45	46	47	4.8	40	50
MTU		2.0	<u>-</u>		0.0	0.7	0.2	0.0	0.7	5.5	0.0	5.7	0.0	5.5	7.0	7.1	7.2	7.5	7.7	7.5	7.0	7.7	7.0	7.3	0.0
10	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	3.0	3.0 3.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	3.0	3.0 3.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	3.0	3.0 3.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
23	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	3.0	3.0 3.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	3.0	3.0 3.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28	3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.6	3.0	3.0 3.	5 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30	4.0 4.0 4.0 3.5 3.5 3.5 3.5 3.5 3.5	3.5	3.5 3.	5 3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
32		3.5	3.5 3.	5 3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
34		4.0	4.0 4.	9 4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
36		4.5	4.5 4.	1 4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
· 30		4.5	4.3 4.	5 4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
39	5.0 4.5 4.5 4.5 4.5 4.5 4.5	4.5	4.5 4.	5 4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
40		4.5	4.5 4.	9 4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
41		5.0	5.0 5.	1 5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
42	Not Applyzod	5.0	5.0 5.	1 5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4:5	4.5	4.5
43	NOL Analyzeu	5.5	5.5 5.	5 5 5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.5	4.5	4.5
		5.5	5.5 5.	5 5 5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
45		6.0	5.5 J.	5 5 5	5.5	.5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
40	If 10 irradiated stainless steel	0.0	0.0 5.	0.0	0.0	5.5	0.0	0.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
4/	rods are present in the	0.0	0.0 0.	1 0.0	0.0	0.0	0.0	0.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	0.0	5.5	5.0
48	add an additional 5.0 years of	6.0	6.0 6.	1 6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
49	cooling time	6.5	6.5 6.	0 6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5
50	Sooming units	6.5	6.5 6.	5 6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5
51		7.0	7.0 6.	5 6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
52		7.0	7.0 7.	0 7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0
53		7.5	7.5 7.	5 7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
54		8.0	7.5 7.	5 7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5
55	1 '	8.0	8.0 8.	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5
56	4	8.5	8.5 8.	0 8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0
57		9.0	8.5 8.	5 8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
58		9.0	9.0 9.	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5
59		9.5	9.5 9.	5 9.5	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
60		10.0	10.0 10	0 9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0
61	1	10.5	10.5 10	510.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5
62		11.0	11.0 10	5 10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0

(Minimum required years of cooling time after reactor core discharge)



Table 1-4fBWR Fuel Qualification Table for Zone 6 Fuel with 0.7 kW per Assembly for the NUHOMS®-61BTH DSC

Burn-Up,	<u> </u>						<u></u>						Latt	ice A	vera	ge In	itial	U-23	5 En	richn	ient,	wt %	; ;	÷										
GWD/	i a	12	15	20	21	22	23	24	25	2.6	27	28	29	30	31	32	33	34	35	3.6	37	3.8	30	40	41	42	43	44	45	4.6	47	48	40	5.0
MTU	0.0	1.2	7.0	2.0	2.7	2.2	2.0	2.4	2.0	2.0	2.7	2.0	2.5	0.0	0.1	0.2	0.0	0.4	0.0	0.0	0.7	0.0	0.0	7.0	7.7	7.2	7.0	7.7	7.0	7.0	7.1	7.0	7.5	0.0
10	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
23	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25	3.0	3.0	3.0	3.0	3.0	3.0	.3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0
32				4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
			, í	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.5	3.5	3.5	3.5
30				4.5	4.5	4.5	4.5	4.0	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
30	{			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
40			L	4.5	4.5	4.5	4.5	4.0	7.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0
40										4.5	4.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.5	4.5	4.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
47	ł									5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
43			N	ot L	na	1176	hd			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	45	4.5	45	4.5	4.5	4.5	45	4.5
44			18		u rai	1920	,u	*		5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	50	4.5
45										5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
46	1 1	If 1	0 irra	diate	d et	ainla	ce et	001		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
47		rod	s are	pres	sent i	in the	33 30 9	661		6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0
48		rec	onsti	tuted	l fuel	asse	mbl	у,		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
49		ado	l an a	additi	ion al	5.0	years	s of		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
50		coc	oling	ime.						6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5
51	•			ź					· ·	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
52				-				2		7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0
53									- [7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
54										7.5	7.5	7.5	7.5	7:0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5
55									[8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5
56									· [8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7,0	7.0	7.0	7.0	7.0
57										8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0
58										9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
59									[9.5	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5
60										10.0	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0
61									l	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
62										10.5	10.5	10 5	10.5	10.5	10.0	10.0	10.0	10.0	100	95	95	95	95	90	90	90	90	90	90	90	90	90	8.5	8.5

(Minimum required years of cooling time after reactor core discharge)

Notes: Tables 1-4a through 1-4f:

- Burnup = Assembly Average burnup.
- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an lattice average initial enrichment less than 0.9 (or less than the minimum provided above for each burnup) or greater than 5.0 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 62 GWd/MTU is unacceptable for storage.
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 3-years cooling.
- See Figure 1-17 through Figure 1-24 for a description of the zones.
- For reconstituted fuel assemblies with UO_2 rods and/or Zr rods or Zr pellets and/or stainless steel rods, use the assembly average equivalent enrichment to determine the minimum cooling time.
- The cooling times for damaged and intact assemblies are identical.
- Example: An intact fuel assembly, with a decay heat load of 0.22 kW or less, an initial enrichment of 3.65 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a 24 year cooling time as defined by 3.6 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) in Table 1-4a.



Table 1-5a

PWR Fuel Qualification Table for Zone 1 Fuel with 0.6 kW per Assembly for the NUHOMS[®]-32PTH1 DSC (Fuel without CCs)

(Minimum required years of cooling time after reactor core discharge)

Burn																	Maxi	mum	Asse	embly	Aver	age i	Initial	U-23	5 Eni	richm	ent, v	vt. %				U /												Ti
GWD/	07	0.8	0	1	1	1 1	2 1	1	1 1 5	1.6	17	1.8	10	20	21	22	23	21	25	2.6	27	28	20	30	21	22	22	24	3.5	36	37	2.8	20	40	11	12	13	11	4.5	16	47	18	10	5.0
MTU	0.7	0.0	0.0	<i>'</i>	<u> </u>	<u> </u>		, ,	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	/.0	1.7	1.0	1.5	2.0	2. 1	2.2	2.0	£.7	2.0	2.0	2.7	2.0	2.5	0.0	0.1	0.2	0.0	0.4	0.0	0.0	0.7	0.0	0.9	7.0	7.7	7.2	7.0	7.7	7.0	7.0	7.7	7.0	7.3	
10	3.0	3.0	3.0	7 3.	0 3.	<u> 0</u> 3	.0 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.5	3.5	3.5	5 3.	5 3.	5 3	.5 3.8	5 3.5	5 3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	5.0	4.5	4.5	5 4.	5 4.	5 4	.5 4.8	5 4.5	5 4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
25	تىنىسىرون	i-ontrad		n				threasure	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0
28	unatunta	araarsaadi	ылыла	IT LIN DOLL	in and the second	un anti-	matamanan	ngratina a	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0
30	sum book	โดงกำหลัง		sa.onfore-	urrauditrau	built ng T	และนายสิงกิจังกร	stangar an		8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
32	<u>manan</u> u	un antana	nanthan	no antino	Lifter Adda	ulin and		an markana	10.0	0 10.0	10.0	9.5	9.5	9.5	9.5	9.5	9:5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0
34	anataa		atannation		uci-añaci	in inserantes		enserature.	12:0	12.0	11.5	11.5	11.5	11.5	11.5	11.0	11.0	11.0	1 <u>1</u> .0	11.0	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	10.0	10.01	10.0	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5
36	A.II	1bai10120.1	านคอะสาวาาเร	nanthra	tann duanta			magnat	14.5	5 14.5	14.0	14.0	14.0	14.0	13.5	13.5	13.5	13.0	13.0	13.0	13.0	13.0	12.5	12.5	12.5	12.5	12.5	12.5	12.0	12.0	12.0	12.0	12.0	12.01	12.0	12.0	11.5	11.5	11.5	11.5	11.5	1.5	11.51	1.5
38	maaroo	Booliston	1647514,0017.	ynan an	acare o nation	aren alla	noranitanitati	ipo m utore	17.5	5 17.0	17.0	17.0	17.0	17.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	14.5	14.5	14.5	14.5	14.5	14.5	14.0	14.0	14.01	14.0	14.0	14.0	14.0	14.0	14.0	14.0 1	4.0	14.01	13.5
39	/BebBins	n or angelia di			an a	an o-me		10000.000	18.5	5 18.5	18.5	18.0	18.0	18.0	18.0	18.0	18.0	17.0	17.0	17.0	16,5	16.5	16.5	16.5	16.5	16.5	16.0	16.0	16.0	15.5	15,5	15.5	15.5	15.5 1	15.5	15.5	15.5	15.5	15.5	15.5	15.5 1	5.0	15.01	5.0
40	ransa		untitet app	an a	1. annow	an sa	Baland a shid		20.0	20.0	20.0	20.0	20.0	20.0	19.0	19.0	18.5	18.5	18.5	18.5	18.5	18.5	17.5	17.5	17.5	17.5	17.5	17.0	17.0	17.0	17.0	17.0	17.0	17.01	17.0	17.0	17.0	17.0	17.0	17.0	17.01	7.0	16.0 1	6.0
41	Jour William	2000/05428	ngeson.ee	ş. B idrictica	a	ngarragada	an an a n an	enerne en	22.0	21.5	21.5	21.0	21.0	20.5	20.5	20.0	20.0	20.0	20.0	20.0	19.5	19.5	19.5	19.0	19.0	19.Ó	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.01	18.0	18.0	18.0	18.0	18.0	18.0	18.0	8.0	18.01	8.0
42	2000/776-02		taranana	unen dur.		aravantanta	anan andar an					ಗಳಾಗುವಗುವ	an a	2022201737899	contraction	and the second					21.0	21.0	20.5	20.5	20.5	20.5	20.0	20.0	20.0	20.0	20.0	20.0	19.5	19.51	19.5	19.5	19.5	19.5	19.5	19.5	19.5	9.5	19.51	9.5
43	Augenous Ta	a portante				raws (107		ontrance	an a	100000-0-00-00-00-00-00-00-00-00-00-00-0		tarato ma		There is a second s		an a	an an an	C	an an think		22.5	22.5	22.0	22.0	22.0	21.5	21.5	21.5	21.5	21.5	21.5	21.0	21.0	21.02	21.0	21.0	21.0	21.0	21.0	21.0	21.02	21.0	21.02	20.0
44			hillinin wo		··· m m	and and	annatanasata	mmmeril	the choice and	ritte hatgete	attiineenettii a	utu Granut	Billiunuuriin	MSrivelliner		attratump.2	ngrangung.	a anterno	u	conservation of the	24.0	23.5	23.5	23.5	23.0	23.0	23.0	23.0	23.0	23.0	22.5	22.5	22.5	22.5	22.0	22.0	22.0	22.0	22.0	22.0	22.0	2.0	22.02	2.0
45	1000-10100	Treasure of the	ana	-andug	111111111111			and the second		aannanaan	and the second	-ogenterrr	concenter	T-monthern	onuternativez	nurrentad	2000gith.oth	າກການພາກສາກາ	annum ann		25.5	25.0	25.0	25.0	24.5	24.5	24.5	24.5	24.5	24.0	24.0	24.0	24.0	23.5 2	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.52	23.5
46	auton	quanyas	ditationation	auogaaa	nandaad	munotest	antanatadara	eta tradas	and a state of the	annananan a	namanahin	and and a second se		alanaanaa	anananan	grannan	Zanantaa	unununn	uteginaev	manna	27.0	26.5	26.5	26.0	26.0	26.0	26.0	26.0	26.0	25.5	25.5	25.5	25.5	25.0 2	25.0	25.0	25.0	25.0	25.0	25.0	25.02	25.0	25.02	24.5
47	nafa tuan		illanatinus		nun nun	nanana (o	antonistante	menganer	nimunin (1	TOMOLOGICA	unionnam	moonange	annaaa	mmmmm	ndingraya,	ana ang ang ang ang ang ang ang ang ang	animiana	ala ana ana ana ana ana ana ana ana ana	noaturoan)	1101-1316310	28.0	28.0	28.0	27.5	27.5	27.5	27.5	27.0	27.0	27.0	27.0	27.0	26.5	26.5 2	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.52	26.5
48	mmm	ոութնես		wanan	uumminin	an minar	no mangalana	Changeoice	abanata ata	ananganana.	mucation	ranalandara	tano manata	արարություն	nugitua ani	a correction and	manuna	La Januari	waaaaa	no n aipete	29.5	29.5	29.5	29.0	29.0	29.0	28.5	28.5	28,5	28.5	28.5	28.5	28.0	28.02	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.02	28.0
49	macow			are ware and	Tour (Gallere	Saturali	nnan allataite	anopencia	amangada	mannan	na destantios	umonum	200000-200	ubdalanas	managata	radenam	nan <u>nan</u> n	anulus auto	wergentered	taripupat stars		ujinujina	titter unitetral	30.5	30.5	30.0	30.0	30.0	30.0	30.0	30:0	29.5	29.5	29.5	29.0	29.0	29.0	29.0	29.0	29.0	29.0	<u>29.0</u> 2	29.02	29.0
50	zanang	1080°LO	nostano an	and the second	anna an	bullen	auronalium d	tradition for	in a constant	abouneutit	analan opri	de Bangiga	and nature	uatapura	ananganan		South and	aaaaaaa	anna ann ann ann ann ann ann ann ann an	imscopeter	nontantiga	ntuttaanu	W qq <i>uu</i> ta	31.5	31.5	31.5	31.5	31.0	31.0	31.0	31.0	31.0	31.0	31.03	30.5	30.5	30,5	30.5	30.0	30.0	30.0	10.0	30.03	30.0
51	utan na tan		ange stranner	av magning	DIMINIAN COLUMN	sumatin	nannantin.	an a		theory and the second	THE STREET, ST	mountagr	and quarte	anatarana	BUILDER	Spanetimer	satanatra	engerator	ta nuntun	anutanaa	autandpa	umannum	nan ann	33.0	33.0	32.5	32.5	32.5	32.5	32.5	32.5	32.0	32.0	32.03	32.0	32.0	31.5	31.5	31.5	31.5	31.53	11.5	31.53	31.5
52	huamo.	-Commune	hond white o	nonenuse	anannana			ALOVE: 1944	and the second	umunene		an a	SHARTHARD	แออาเมรณ์เส	umpenung	narranaratan	ananiamana.	ratio that and	mnumm		allo zamer	1 an	racoance		34.5	34.0	34.0	34.0	34.0	33.5	33.5	33.5	33.5	33.5 3	33.5	33.0	33.0	33.0	33.0	33.0	33.0	32.5	32.5	32.5
53	Dallio construction				e-ciriei-na	allentit		an ar		8-30-10			an a			and the second second		stocatorio (and the second	he approximate	35.5	35.5	35.5	35.5	35.0	35.0	35.0	35.0	34.5	34.5	34,5	34.5	34.5	34.5	34.5	34.5	34.0	34.0	34.0	34.0
54		Daviga		auunna	100 CO	wanaa			16 :		ایک میشند. محمد محمد ا	indonia Lata			aal	da	<u></u>				i.a				Sistema a	36.5	36.5	36.5	36.5	36.5	36.5	36.0	36.0	36.0 3	36.0	35.5	35.5	35.5	35.5	35.5	35:5 3	35.5	35.02	35.0
55	Ranona	ana		n terretatu		anana		ole:	IJ II	rraa	alec	i sia	inies	ss su	eei r 	oas 	are	pre	seni		anatharaana	an a	an a	watationso	an compose	38.0	38.0	37.5	37.5	37.5	37.5	37.5	37.0	37.0 3	37.0	37.0	37.0	37.0	37.0	36.5	36.5	36.5	36.5	36.5
56	2eGerlantes		monanoe	at statutes - to	ap-#457 <u>232</u>	n-au <u>r</u> -c	u u	i ine	rece)nsti 1	iuee	i jue	a asi	semi	biy, i	aaa	an 1:				and a second		.momentur	· restation 130	and and the	39.0	39.0	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.0	38.0	38.0	38.0	38.0	38.0	37.5 3	37.5
57				mounare				aan	onai	yea	r oj	cooi	ing	iime	jor	cool	ung	iime	es					catedra comotor	en et te secretaria		mannetti	40.0	40.0	40.0	40.0	40.0	40.0	39.5 3	39.5	39.5	39.5	39.5	39.0	39.0	39.0	39.0	39.0	39.0
58	mmmitere	1.		natama	munimu	100201012	Ie Ie	ss ti	ian i	i u ye	ears.									gam	and and the second		nannan	grane and	angananan		210200000000	41.0	41.0	41.0	41.0	41.0	41.0	41.04	\$1.0	41.0	40.5	40.5	40.5	40.5	40.5 4	10.0	40.0 <i>4</i>	10.0
59	annan	mana	nonear	annana a	anter en e	hanmo	aphinitation	intentitueso	deensitement		nuconnuce	ununun	auguana	alanan an	ananan	ana ano an	a girin an	internet	ata ana ana ana ana ana ana ana ana ana		A CONTRACTOR		mummun	unuuuuu	singnogen	mantanaa	zagunaya.	42.0	42.0	42.0	42.0	42.0	42.0	42.04	<i>‡2.0</i>	42.0	42.0	42.0	41.5	41.5	41.5	i1.5 i	41.54	1.5
60	1010110	aunum			entimitetet		and the second	nteconnet	attonna a		mentingen		onapanda)0	minimatil	արտանոր	innound	1.00001100	rituluiditio	20mblmm	ntantiatiin	and the state	າດແຫນແມ່ນ	diaman ma	unnumuu				43.5	43.5	43.0	43.0	43.0	43.0	43.0 4	13.0	43.0	43.0	43.0	43.0	43.0	43.04	12.5	42.5 <i>4</i>	12.5
61	aategaaa	segune	an in the second	apamear		muarte	en gewyner		-		,	tydgrinth (cgro	Blougador	nimiliani	autoputration	mannen	nourrotu	domenta	Charles and the	generation of the	in the second	utennatu	äyttalitaan		R.D. Manufactor	1.00021000	manana	44.5	44.5	44.5	44.5	44.5	44.5	44.54	14.5	44.0	44.0	44.0	44.0	44.0	44.0 4	14.0	43.5 <i>4</i>	13.5
62																												45.5	45.5	45.5	45.5	45.5	45.5	45.5 4	15.5	45.0	45.0	45.0	45.0	45.0	45.0	15.0	45.0 <i>4</i>	15.0





PWR Fuel Qualification Table for Zone 2 Fuel with 0.8 kW per Assembly for the NUHOMS[®]-32PTH1 DSC (Fuel without CCs)

1	(Minimum rec	wired	vears o	f cool	ing t	ime a	fter i	reactor	core	disch	iarge))
			<i>yeen o</i> o	,			,	0010101				

Burn			U-235 Enrichment, w	<i>t.</i> %				
GWD/	0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4	4 1.5 1.6 1.7 1.8 1.9 2.0 2.1	2.2 2.3 2.4 2.5 2.0	3.0 3.1 3.2 3.3	3.4 3.5 3.6 3.7 3.8	3.9 4.0 4.1 4.2 4.3	4.4 4.5 4.6 4.7 4.8 4.9 5.0	
MTU								
10	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	3.0 3.0 3.0 3.0 3.0	0 3.0 3.0 3.0	3.0 3.0 3.0 3.0	3.0 3.0 3.0 3.0 3.0	3.0 3.0 3.0 3.0 3.0 .	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0
15	3.5 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	3.0 3.0 3.0 3.0 3.0	3.0 3.0 3.0	3.0 3.0 3.0 3.0	3.0 3.0 3.0 3.0 3.0	3.0 3.0 3.0 3.0 3.0 3.0	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0
20	4.5 4.5 4.0 4.0 4.0 4.0 4.0 4.0 4.0	0 3.5 3.5 3.5 3.5 3.5 3.5 3.5	3.5 3.5 3.5 3.5 3.	5 3.5 3.5 3.5	3.0 3.0 3.0 3.0	3.0 3.0 3.0 3.0 3.0	3.0 3.0 3.0 3.0 3.0	3.0 3.0 3.0 3.0 3.0 3.0 3.0
25		4.5 4.5 4.5 4.5 4.5 4.5 4.5	4.5 4.5 4.0 4.0 4.0	0 4.0 4.0 4.0	4.0 4.0 4.0 4.0	4.0 4.0 4.0 4.0 4.0	4.0 4.0 4.0 4.0 4.0	
28	อมิตรีปการที่เป็นสายและสุของการการการการการการการการการการการการการก	5.5 5.5 5.0 5.0 5.0 5.0 5.0	5.0 5.0 5.0 5.0 5.0	0 5.0 5.0 4.5	4.5 4.5 4.5 4.5	4.5 4.5 4.5 4.5 4.5	4.5 4.5 4.5 4.5	4.5 4.5 4.5 4.5 4.5 4.5 4.5
30	ബാഡാളെജ്ജ സ്ഥന്താനം പ്രത്തിനും നിന്ധായത്ത തത്താന്ത്രം സൂദം മുത്തം പ്രത്യാം പ്രത്താക്കാണ്. താന്ത്രത്തിന്ത് താത്ത	6.0 6.0 5.5 5.5 5.5 5.5 5.5	5.5 5.5 5.5 5.5 5.8	5 5.0 5.0 5.0	5.0 5.0 5.0 5.0	5.0 5.0 5.0 5.0 5.0	5.0 5.0 5.0 5.0 5.0	5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0
32	ชีวิเสราการกระบาทสาการสำนักษะสังการการเป็นสารสมบันนักเป็นกับการจากกระ ๆ การนัดเรา 35 การกับ การกระบาทสาร	6.5 6.5 6.5 6.0 6.0 6.0 6.0	6.0 6.0 6.0 6.0 6.0	0 6.0 5.5 5.5	5.5 5.5 5.5 5.5	5.5 5.5 5.5 5.5 5.5	5.5 5.5 5.5 5.5 5.5	5.5 5.5 5.5 5.5 5.5 5.5 5.5
34	កបាតម្លាយក្មេយស្រាយជាមកជាការការបានប្រការប្រកាសការជាការបាយជានាំពេលជាការប្រជាជាការបានប្រសាស	7.5 7.0 7.0 7.0 7.0 6.5 6.5	6.5 6.5 6.5 6.5 6.	5 6.5 6.5 6.5	6.5 6.0 6.0 6.0	6.0 6.0 6.0 6.0 6.0	6.0 6.0 6.0 6.0 6.0	6.0 6.0 6.0 6.0 6.0 6.0 6.0
36	japo apara appara a ppara appara ap	8.0 8.0 8.0 7.5 7.5 7.5 7.5	7.5 7.5 7.5 7.0 7.0	7.0 7.0 7.0 7.0	7.0 7.0 6.5 6.5 6.5	6.5 6.5 6.5 6.5 6.5	6.5 6.5 6.5 6.5 6.5 6.5 6.5	
38		9.0 9.0 9.0 9.0 8.5 8.5 8.5	8.5 8.5 8.0 8.0 8.0	8.0 8.0 7.5 7.5	7.5 7.5 7.5 7.5 7.5	7.5 7.5 7.5 7.5 7.5	7.0 7.0 7.0 7.0 7.0 7.0 7.0	
39	່ ເ	10.0 9.5 9.5 9.5 9.5 9.5 9.0	9.0 9.0 9.0 8.5 8.	8.5 8.5 8.0 8.0	8.0 8.0 8.0 8.0 8.0	8.0 8.0 8.0 8.0 8.0	7.5 7.5 7.5 7.5 7.5 7.5 7.5	
40	<u>รแสสตรมหารีเของอากาศ หารเของออกและวิทยาว์ตามวิทยาว์ตามวิต</u> รมสุขานคราวีตามประกัญชามรูกการเกณ	10.5 10.5 10.5 10.0 10.0 10.0 9.5	9.5 9.5 9.5 9.5 9.6	9.0 9.0 8.5 8.5	8.5 8.5 8.5 8.5 8.5	8.5 8.5 8.0 8.0 8.0	8.0 8.0 8.0 8.0 8.0 8.0 8.0	
41	ֈֈՠֈ֎ՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠՠ	11.5 11.5 11.0 11.0 10.5 10.5 10.5	10.5 10.0 10.0 10.0 10.	0 10.0 9.5 9.5	9.5 9.5 9.5 9.5	9.0 9.0 9.0 9.0 9.0	9.0 9.0 9.0 9.0 8.5	8.5 8.5 8.5 8.5 8.5 8.5 8.5
42	ងហោះសារជាមួយអាយាយផ្លូវផ្លូវនាំងមួយស្ថិតអាយាមជាអ្នកដែលដែលនៅអ្នកដែលដែលនេះ អ្នកអ្នកអាយាមជាអ្នកអាយា		արություններուներուններու	10.5 10.5 10.5	10.0 10.0 10.0 10.0	10.0 10.0 10.0 10.0 9.5	9.5 9.5 9.5 9.5 9.5	9.0 9.0 9.0 9.0 9.0 9.0 9.0
43	ฐิวฏิบารแล้วสินสาวการเป็นสาวการการการการการการสาวการการสาวไปสาวการการการการการการการการการการการการการก	กละเป็นในอาการแบบการการการการการการการการการการการการการก		11.5 11.0 11.0	11.0 11.0 11.0 10.5	10.5 10.5 10.5 10.5 10.0	10.0 10.0 10.0 10.0 10.0 1	0.0 10.0 9.5 9.5 9.5 9.5 9.5
44	การการแกกเห็นแกรงแบบแบบคุณสาราชาวิตาราชาวิตาราชาวิตาราชาวิตาราชาวิตาราชาวิตาราชาวิตาราชาวิตาราชาวิตาราชาวิตารา	າງການແບບການການການທາງແຮງການສາມາດການການການການການການການການການການການການການກ		12.0 12.0 12.0	12.0 11.5 11.5 11.5	11.5 11.5 11.0 11.0 11.0	11.0 11.0 11.0 11.0 10.5 1	0.5 10.5 10.5 10.5 10.5 10.5 10.5
45	ា លោកជាមួយស្នែងចំណោះស្រុងនាក់សម្តាស់ស្រុងស្រុងស្រុងស្រុងស្រុងស្រុងស្រុងស្រុង	- מערכו מולים אינו אינו אינו אינו אינו אינו אינו אינו		13.0 13.0 13.0	12.5 12.5 12.5 12.5	12.0 12.0 12.0 12.0 12.0	11.5 11.5 11.5 11.5 11.5 1	1.5 11.5 11.5 11.0 11.0 11.0 11.0
46	การประเทศการประเทศที่สุดสารประกาศสารสารสารการการประกาศการประเทศการประเทศการประเทศการประเทศการประเทศการประเทศการ	י המווייים מתמה שמתואה האמת מהוויים המתואיים המתואיים המתואה המתומה במתואה המתואה המתואה המתואה המתואה היה היה		14.0 14.0 14.0	13.5 13.5 13.5 13.5	13.0 13.0 13.0 13.0 13.0	12.5 12.5 12.5 12.5 12.5 1	2.5 12.5 12.0 12.0 12.0 12.0 12.0
47	ייייט איז	ימהנגענון (מנהי אנגענטיונית מתוחנגנט ונגעטיון, בלוגע טולט אנענט אינגע אינגע אווידע אווידע אווידע אווידע אווידע האנגענט אינגענט אינגענטיין גער אינגענט אינגעט אינגעט אינגעט אינגע אינגענע אינגענע אינגענע אינגענע אינגענע אינגע		15.0 15.0 15.0	14.5 14.5 14.5 14.5	14.0 14.0 14.0 14.0 14.0	13.5 13.5 13.5 13.5 13.5 1	3.5 13.0 13.0 13.0 13.0 13.0 13.0 13.0
48		ก็การการการการการการการการการการการการการก		16.5 16.0 16.0	15.5 15.5 15.5 15.5	15.5 15.0 15.0 15.0 15.0	15.0 14.5 14.5 14.5 14.5 1	4.5 14.5 14.0 14.0 13.5 13.5 13.5
49					17.0 17.0 16.5 16.5	16.0 16.0 16.0 16.0 16.0	16.0 16.0 16.0 15.5 15.0 1	5.0 15.0 15.0 15.0 14.5 14.5 14.5
50		ער אין איז			18.0 18.0 18.0 17.5	17.5 17.5 17.5 17.0 17.0	17.0 17.0 17.0 16.5 16.5 1	6.5 16.5 16.5 16.0 15.5 15.5 15.5
51					19.0 19.0 19.0 19.0	18.5 18.5 18.0 18.0 18.0	18.0 17.5 17.5 17.5 17.5 1	7.5 17.0 17.0 17.0 17.0 17.0 17.0
52					20.0 20.0 20.0	19.5 19.5 19.5 19.5 19.5	19.0 19.0 19.0 19.0 19.0 1	8.5 18.5 18.5 18.5 18.5 18.5 17.5
53					21.5 21.0 21.0	21.0 20.5 20.5 20.5 20.5	20.5 20.0 20.0 20.0 20.0 2	20.0 19.5 19.5 19.5 19.5 19.5 19.0
54	Note	. If immediated at airdown stards	a da ano puonant		22.5 22.5	22.0 22.0 21.5 21.5 21.5	21.5 21.0 21.0 21.0 21.0 2	21.0 20.5 20.5 20.5 20.5 20.5 20.0
55	Nole:	If irradialea stainless sieel r	oas are present		23.5 23.5	23.0 23.0 23.0 23.0 23.0	23.0 22.5 22.5 22.5 22.5 2	2.0 21.5 21.5 21.5 21.5 21.5 21.0
56	in the	e reconstitutea juei assembly,	aaa an		25.0 25.0	24.5 24.5 24.5 24.0 24.0	24.0 24.0 23.5 23.0 23.0 2	23.0 23.0 23.0 22.5 22.5 22.5 22.5
57	additi	ional year of cooling time for	cooling limes			25.5 25.5 25.5 25.5 25.0	25.0 25.0 25.0 24.5 24.5 2	24.5 24.5 24.5 23.5 23.5 23.5 23.5
58	less th	han 10 years.				27.0 27.0 26.0 26.0 26.0	26.0 26.0 25.5 25.5 25.5 2	25.5 25.5 25.0 25.0 25.0 25.0 25.0 25.0
59						27.5 27.5 27.5 27.5 27.5	27.5 27.5 27.0 27.0 27.0 2	27.0 26.0 26.0 26.0 26.0 26.0 25.5
60 ·					또 · · · · · · · · · · · · · · · · · · ·	29.0 28.5 28.5 28.5 28.5	28.0 28.0 28.0 28.0 28.0 2	28.0 27.5 27.5 27.5 27.5 27.5 27.0
61	ani na kana na kananga ka manya na na sa	a dinandikan wasan kana kana kata kata kata kata kata ka	anna an		· · · · · · · · · · · · · · · · · · ·	29.5 29.5 29.5 29.5 29.5	29.5 29.5 29.5 29.0 29.0 2	29.0 29.0 29.0 28.0 28.0 28.0 28.0
62	ĨIJŢŢIJIJĨĹĨĸĸĊŢIJĸĸĬĸŎĸŢĨŊĸĬĬĬĸĊĬIJĸĸĬĬIJŢĬĬĬĬĬŢŢĬŢĬŢĬŢŎŢĿġĊĸĸŔĸĸŔŎĸĔĬĸġĹŢĬĊĬĬĬIJIJĸIJĬĬĹĹŢŢŢĬĬ	<u>៘៸៱៹ៜ៳៳៷៳៳៱៱៱៷៷៳៷៳៷៳៱៳៳៷៳</u>		<u>מהעי ישווש הוצועה אישר אישר במצייש</u>	29 (*)	31.5 30.5 30.5 30.5 30.5	30.5 30.0 30.0 30.0 30.0 3	80.0 29.5 29.5 29.5 29.5 29.5 29.5



Table 1-5c

PWR Fuel Qualification Table for Zone 3 or Zone 4 Fuel with 1.0 kW per Assembly for the NUHOMS[®]-32PTH1 DSC (Fuel without CCs)

(*Minimum required years of cooling time after reactor core discharge*)

Burn																				٨	laxim	um A	ssemi	bly A	verage	e Initia	I U-23	5 Enrie	hment,	wt. %																
GWD/	0.7	0.8	0.9	1.0	1	.1 1	2	1.3	1.4	1.5	1.1	6 1	.7 1.	8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	3 2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
мто		<u> ·</u>		\vdash	┿		+			+	+			+	-+								+		+-			+	-															+		_
10	3.0	3.0	3.0	3.0) 3	0 3	0	3.0	3.0	3.0	3.0	0 3	1.0 3.	0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3.0	3.0	3.0	2 3	.0 3	0	3.0	3.0	3.0	3.1	0 3	1.0 3.	0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.5	3.5	3.5	3.5	5 3	5 3	5	3.0	3.0	3.0	3.1	0 3	3.0 3.	0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25			annara.		100,000		on and a state of the state of	aontonat	nanga	4.0	4.1	0 4	1.0 4.	0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	5 3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3,5	3,5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28	www.mka	duinten [®]	namaja		194 1-11 1		-oura	namu		4.5	i 4.	5 4	1.5 4.	5 4	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
30	10000000	-		encontribut	ufbath.	tationan	www	D <i>upitra</i>	tasteata	5.0	5.0	0 4	1.5 4.	5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
32	ານກອນນາດ	1.07270	berrow	arranana Arranana	NOTED &	tatamina.	110-126		*****	5.5	5.	5 5	5.0 5.	0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.8	5 4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
34	59minst	ante vit	200-000		01020 77222		tagan 100	an a	narad	<u>6.0</u>	6.	0 5	5.5 5.	5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
36		anna an		interior	to anor	ana			rundur	.5	6.	5 6	6.0 6.	0 0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5 5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
38		no agenta	conneel	utanan		unprigeone		racogniti		7.5	7.1	0 7	7.0 6.	5 (6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0
39		7.5 7.0 7.0 6.5 6.5 6.0 <td>6.0</td> <td>6.0</td> <td>5.5</td>															6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5														
40	500	7.5 7.5 7.0 7.0 7.0 7.0 7.0 6.5 6.5 6.5 6.0 <td>6.0</td> <td>5.5</td> <td>5.5</td> <td>5.5</td> <td>5.5</td> <td>5.5</td>															6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5														
.41		-Ter - Hazantar			Markata				000 W (2:1788)	8.5	8.	5 8	1.0 7.	5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	5 6.5	6.5	6.5	6.5	6.5	6,5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
42	rtrauna.	-		feffer-ut-s	-		-					0.000.000	THE COLORED FOR	a contra di Loco	Termaterser			inniemi (Term					7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6,5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0
43		60							•								. 8						7.5	7.5	5 7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
44																							8.0	7.5	5 7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5
45													. ca na ganga										8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7,5	7.5	7.5	7.5	7.5	7. 0	7.0	7.0	7.0	7.0	7.0	7.0
46													no aquanta	-	pp								8.5	8.5	5 8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
47							0.000								-				-90mm (2				9.Ò	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5
48									detundium			100.0100	-				anagrana						10.0	9.5	5 9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0
49		5- 13 19995						anecos an				Deprivation of										-				10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5
50	rorocard	on conce	ever reaction of the	-1001 10020						urniouae			ana ang ang ang ang ang ang ang ang ang			autoriana						et al Charles				10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0
51	70 a 11 a 0	-01109-101			anan		-	- 3-1 -1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	111110-0	509 <i>0.000</i>	an a			6666-61992			and Louis	- -	2 0-101220	Wittingt			endere dere	-		11.5	11.5	11.0	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5
52								- <u>Count</u> h			andraktas	57-25 KR. A					1000-100-000	//www.com/2005		S.S. LOW BOOK	an an ganar sa an	ALANCESS	anano ano a	199922004	1974) 1971 (Second		12.0	12.0	12.0	11.5	11.5	11.5	11.0	11.0	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0
53	1.ngn.net	, a <1010,107	35.455.455	2000-020	902.00	50,00 0010 00	5.00.4 71 2			5700707 83 1	******	1945 July 10	aan			Same da gara		1070001-000	25.00.00 3.00	1.46126.446	2957 GADA	2010/00/00	3 76 (100 (100 A) A	1995 mar	anter eller de	1.10000-0000	13.0	12.5	12.5	12.5	12.0	12.0	12.0	12.0	11.5	11.5	11.5	11.5	11.5	11.0	11.0	11.0	11.0	11.0	11.0	10.5
54				170070200	anta tati	18.194 2.1 7	AGAIN CONTRACTIONS			.20 0111 0103		2007 CO. 3						A27-02-02/07/20 / .	amurt.rrta	30.0003385		ut with the second					, ,	13.5	13.5	13.0	13.0	13.0	12.5	12.5	12.5	12.5	12.5	12.0	12.0	12.0	12.0	12.0	11.5	11.5	11.5	11.5
55	udanîta)	an a	uront rjataa		uns 2.	nga ang	Etaroll)	dnanas.	reteljiler	panyyrdi.	nianno (p	titra grada	a Transfer d	8 98.0-04	dis all and a second second	sta nn atara	maneng	allanutus.	annikany	na canananz	1939999935	nanapin	ain Maratan	d]uchia:	Inforthe Line		ini unita cu	14.5	14.0	14.0	14:0	13.5	13.5	13.5	13.5	13.0	13.0	13.0	13.0	12.5	12.5	12.5	12.5	12.5	12.0	12.0
56	manuty		en atten o	prötimar	TRACTOR	nonanae.	Burbing.	<u></u>	officers.	<u>1.</u>	<u>anut</u> uni	an Break		in the second		Languages		a la angla ang		1997 - 1975 1997 - 1997	<u>2012.000</u>		aran manan ma	19441111111	ann na Instan	an n aithean	สมสารการ	15.5	15.0	15.0	15.0	14.5	14.5	14.5	14.0	14.0	14.0	13.5	14.0	13.5	13.5	13.5	13.5	13.0	13.0	13.0
57	mound	ullur alla	ng@raata	Driditelli	1	Vote	2: .	lf ii	rra	dia	ted	i sic	anl	ess	ste	el ro	ods e '	are j	ores	ent	IN	315	Relation (put	graantte	upro ca ague	ondininina	nifitatatinett		1	16.0	15.5	15 5	15 5	15.5	15.0	15.0	15.0	14 5	14.5	14.5	14 5	140	140	140	140	13 5
58	nanu/Bo	ai, aditat	ingurite	ratituuri	'	'he i	rec.	ons	stiti	utec	t fu	iel	asse	emi	bly,	ada	an	add	itior	ial y	ear	410	ngilinangh	nillinund	drænænd	aduBuBuB	in an	naunhunta	(amazintan)	17.0	16.5	16.5	16.5	16.0	16.0	16.0	15.5	15.5	15.5	15.5	15.0	15.0	15.0	14.5	14.5	14.5
59	lumour	n n n n n n n n n n n n n n n n n n n	n.199901	សារផង		of c	ool	ıng	tir	ne f	oŗ	co	olin	g t	ıme	s les	s th	an l	0 ye	ears		m	, 1990,000		000000000000000000000000000000000000000		waangaa	192000000000000000000000000000000000000	בודייאינטימומים	18.0	17.5	17.5	17.5	17.0	17.0	17.0	16.5	16.5	16.5	16.0	16.0	16.0	16.0	15.5	15.5	15.5
60	ng <u>ng ng ng n</u> g ng	nteitein	ab siling	raymm	L			•						1				. ·				ene:	trautania	undaan	ututoritiinin	aunt ata a	an a	uitroisesent		19.0	18.5	18.5	18.0	18.0	18.0	17.5	17.5	17.5	17.5	17.0	17.0	17.0	16.5	16.5	16.5	16.5
61	allie is state	un finin	alamatic	atizdit.		190000000	nathanai An tha	antianaise	uanuaa	anannana	1019-11-11-11-11-11-11-11-11-11-11-11-11-1	teoretor	anna anna	anna da	nanaran		annan an a	mmmaaa	ANNE ANNE D	naturo dan	53 00030505	innoulitie	annan ann ann an ann ann an ann ann ann	illininin the	Guta Di Ca	annarie an	aniin aanuu aa		lain thailte	20.0	19.5	19.5	19.0	19.5	19.0	18.5	18.5	18.5	18.0	18.0	18.5	18.0	17.5	17.5	17.5	17.5
62	ungunta	suump	arran <u>to</u>	stinant	un figure	noratudiu	unicea,	ullitutt	eta 1960 (P	dierpielinen	an a that the second		aantaanta	antae an	inistraja	anos Croti	nautianua	anungunos	inngenaat	anna ann ann an an an an an an an an an	unadard	ectricane	tanaranta	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Augustan.	nudanturi	ii.wanancan	lua:Mdyndf	natura.	20.0	20 5	20.5	20.0	20.0	20.0	20.0	10.5	10.5	10.0	10.0	10.0	10.0	18.5	18.5	18.5	18.5
٥z																														120.0	20.0	20.0	20.0	[∡v.v	20.0	120.0	19.0	13.0	19.0	13.0	L19.0	13.0	10,0	10.0	10.0	10.0



Table 1-5d

PWR Fuel Qualification Table for Zone 5 Fuel with 1.3 kW per Assembly for the NUHOMS[®]-32PTH1 DSC (Fuel without CCs)

	c i	· · ·	1· 1 \
ι Μιπιμίμα τραμιτρά υρατ	ς οι εορμησ	time atter reactor	core discharge
(minimum required year)	$, o_j cooming$	mine after reactor	core disentarger

Burn																		Max	imun	a Ass	embl	y Av	erage) Initi	al U-2	235 E	Enric	hmer	nt, w	t. %				<u> </u>							•					
GWD/	0.7	0.8	0.9	1.0	1.1	1.:	2 1.	3 1.	4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	7 2.8	3 2.	9 3.0	0 3.	.1 3	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	30	30	30	30	30	3	2 3	03	0	3.0	3.0	30	30	30	30	30	30	30	30	30	30	31	2 31	13	0 3	2 3	0 3	20	20	30	3.0	30	30	30	30	30	30	30	30	30	30	30	30	3.0	3.0	3.0
15	3.0	30	3.0	30	30	3	$\frac{1}{2}$	0 3	0	30	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	30	31	2 30	2 3	0 3	$\frac{1}{2}$	0 3	20 3	30	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	30	3.0
20	3.0	3.0	3.0	3.0	30	3	$\frac{1}{3}$	0 3	0	30	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	30	31	2 30	2 3	0 3	2 3	0 3	20 3	30	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	30	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25		1						- L-,		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2 3.0	2 3	0 3	2 3	0 3	10 3	30	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	30	3.0	3.0	3.0	30	3.0	3.0	3.0
28		th Points and	22500.2005.	10.000 (C		and to make	0.37 M 1005	37 42-20 227 -045		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.(3.0	2 3.	0 3.0	0 3.	.0 3	1.0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30	agrantaman	0.000-0000000	nan Th an	nio-cuitari	1 11 -11 1 -121			nga chiji filitina.	- 1	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	5 3.5	5 3.	5 3.5	5 3.	.5 3	3.5 3	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32	2000	at an		e an	10-12-31	dia manana mana man Manana manana mana mana mana	aruan anatan		10.2	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	5 3.5	5 3.	5 3.8	5 3.	5 3	8.5 3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
34			ALCONATION .		00710047F	പ്പംരാത്ത			enten	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.() 4.() 4./	0 4.0	0 4.	.0 4	1.0 3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
36		ionnin in	notroffund	uranoini		ngu gu ngu	ananana.	annanna n a		5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.() 4.0) 4.	0 4.0	0 4.	.0 4	1.0 4	1.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
38		5.5 5.5 5.0 5.0 5.0 5.0 5.0 4.5 <th>4.5</th> <th>4.0</th>															4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0													
39	morane	5.5 5.0 5.0 5.0 5.0 5.0 4.5 <th>4.5</th> <th>4.5</th> <th>4.5</th> <th>4.5</th> <th>4.5</th> <th>4.5</th> <th>4.5</th> <th>4.5</th> <th>4.5</th> <th>4.0</th> <th>4.0</th> <th>4.0</th> <th>4.0</th> <th>4.0</th> <th>4.0</th> <th>4.0</th> <th>4.0</th>															4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0													
40	attuette	utdutu	6.0 5.5 5.5 5.0 5.0 5.0 5.0 5.0 4.5 <th>4.5</th>															4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5												
41	dupubuu	pomition	nangara	materia		apumdo	automni	tometore	0000	6.5	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0) 5.0) 5.(0 5.0	0 5.	.0 5	5.0 4	1.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
42	nifirenti	unn	roce and and	րանիսը		anpigun	areauptu	Manananan	nonato	TELETHOOD	unistra anata	ainanaanu	ununutu ununu	omagang		ranna	യാനുംബും	ngerennene	unanana	D		5.0) 5.0) 5.(0 5.0) 5.	.0 5	5.0 5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
43	ogrenteria	Pantanada	esona matara	uninago	regardida	nd function	ngunan	ananann	taninaur	uningator	())TRACE (CONTRACT (CONTRACT))))	madootino	angaran at	101101110120	plannono	minasim	anabiana	nangatur	manuon	ananaan	աստութւն։	5.5	5 5.5	5 5.0	0 5.0	0 5.	0 5	5.0 5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5
44	tifogalanda	ng ya Minam		mpogun	nouncepu	upuarau	nnnaa	unuunnuun	nungun	minovitu	11 1011100	antionanto	angunun	ommunder	nonangau	anananan		nummana	aabtutaata	uniterreter	nationalization of the	5.5	5 5.5	5 5.8	5 5.8	5 5.	.5 5	5.5 5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
45	Qilmintut	mangam	naquininga	f uncinging	a an	goodd <u>urp</u>		nananana	้มมาร์เก	11002011191	mitutinum	يوموها مي ا	umonin ma		non juogeoi	instrumpat	ananananananananananananananananananan	manustad	771-022107000	umaanintu		.5.5	5 5.5	<u>5 5.</u>	5 5.8	5 5.	.5 5	5.5 5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
46	duranina	ranoutor	rannyn	ուսուսորո	gutanning	n sunnun	19000001111	mondum	munia	<u>Wanangar</u>	արդիկուս	mandugu	natarapapa	สถานอาเม	<u></u>	nuonnior	annanaa	nenerane:	nin an	ուստուց	៣០៣០០០	<u>ه</u> 6.0) 6.0) 6.(0 6.0	2 6.	.0 5	5.5 5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0
47	outtana	ennnord	manana	masmap	nanananan	wanna	minini	unum cate	10:00 aud		n na sa	<u>Circulan</u> tas	matamas	annan an a	natatimet	utanation	mmmaar	a agga a agga	untertau	nana ana	ana	u 6.0) 6.0) 6.1	0 6.0	2 6.	.0 6	6.0 6	5.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
48	antratana a									un ann an a	tanggarta pa	t.s:lasiata	a na manana ang manana Na manana ang			gannannen.	adhalpetter	na ana ang ang ang ang ang ang ang ang a	in coloradora	an a	and and a second	6.5	6.5	5 6.	5 6.8	5 6.	.0 6	5.0 6	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
49	dittagn ca			1000 CT		innonitain	0.000000		utrosout		6.71220700			muunna	m inomen	a a filmana	diorutian	panetrone	unden allan	aladdadd	antonoutras	gan azan	amenamen	สมปัตว์เมล	6. t	5 6.	.5 6	5.5 6	5.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5
50	ninine	an a subara	numpor	1000000-1000		ntuntear	a finanza an		107703388	no antes a	and the second secon		niimetint	an a			2.407100700	contailathair	inatean-au	17.000 CO.000	naranan	mainine	an ann an	annaaminte	ange 7.0	0 0.	.5 0	0.5 0	2.5	0.5	0.5	0.5	6.5	6.5 6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
57	30 HAMES	eananan	**********	an de canada an				allagillasi (ar	TARLOTTA:		in the second	(action)(crit		1911) 1911) 1911)	nautanana		anananana	nannaan	n ganganga		ngan (jili ngjan)	1000000000	manuna-	anaranana		7 7.	5 7	.0 1	7.0	7.0	7.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.U 6.E	6.0	6.0
52	des pant erne	ainqasa	verge verse	nanananan	ne um tra					in an	annan an ta	Mapourtu	unestain	aga maadiin		anang ang ang ang ang ang ang ang ang an	a nga ngangan	anno aireana	in a subsection of the	e an contra a	angeranjigea	ana di Kalandan	Approximator	anan na	and the second	1. 1. 7	5 7	.5 7	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	0.0	0.0	7.0	0.5	0.5	0.5	0.5 6 5	0.5 6.5	0.5	6.5
54	ytermanya, t	zyntri ner		Suite auto auto	Tanan Tanahaga					o suronza					an a				2000 <u>0</u> 0000	- 	027@mm-1*m			- 	Barran Clarva	an. / .	.0 /	20 8	20	7.5 8.0	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
55	antidores,	772296289	100000L->	-	Not	<u>, ∙</u>	firi	radia	rto.	d st	ainl	055	st <i>oo</i>	Iro	te a	o ni	.050	nt			nortaretter					, 112102-02		15 8	30	8.0	80	80	80	8.0	8.0	7.5	7.5	7.5	7.5	7.5	75	7.5	7.5	7.0	7.0	7.0
56	Manut-Ro	andregen de		nenas	in th	n r	,, 2001	nstit	nte	d fu	iel a	1550	nhh	$\frac{1}{2}$	ld ar	ι 1	coci	a		** v 100 <u>00</u> 00	anset ti sono-	Summer and	mudinani	an a			8	1.5 8	3.5	8.5	8.5	8.5	8.5	8.0	80	80	8.0	8.0	8.0	80	7.5	7.5	7.5	75	75	7.5
57	01200-2000	U and Vite	1999,000	8772.	add	itiai	nal	vear	nt of	c_{0}	slin	σ tin	nory no fi	r co r co	nalir	ι Iσ ti	nes		anortan x 1		201-201-020-0	pan <mark>anana</mark> n	un parte	sannedin	nationation Antiperation	portugano 	nan L			9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	80	8.0
58	ത്താനു	1900-101 <u>190</u>			less	tha	n 11	, I vei	rs T			- ·."	.e je	.,		·8 ···		1	1001000000	122300000	er.Togense	100 000 00			anainainn	ningran Andre	lan na marata	2,000		9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0
59	in an	ningino ana						- ,0		•									owno.ru		3727 4127 23	2000000000	20000000000000000000000000000000000000	ang baganan '		nite ann an	0.000.000		2/02/2000 [10.01	10.0	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5
60	1 9 220 970302	נענגאניינו						inandi sai lafa	an tinn i	elitterine	nan Hinnette						anter printe	anninina,	gio oralizazi		ayang kana	an an anan	-Distriction	potennini.	ainin a'	teàrant ian		9960770701071	1000 BB	10.5	0.5	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0
61	termonen a					an a	1.0000000000	anadonsiin -	uldavan.	uningan-	ondrugano		and transferred	<u>ny an</u> an	arantan Qo			Marka Marka	annagan an	mingatao	and a second second	Bine and B	.undynady	tano unana	an a	ndfunfindi	an <u>thatan</u> t	1000.000.000	NUT NUME	11.01	1.0	11.0	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5
62	194 <u>1719</u> 493		skab <u>uru</u> n		72		rann gotha		and and and		-attache	and		dullurura	19.000.00 	ana manga	idint.ord	1000000000	odinini fiziki				.reference			eningen ine			1	11.5	1.5	11.5	11.5	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.5	10.0	10.0	10.0	10.0	10.0



Table 1-5e

PWR Fuel Qualification Table for Zone 5 with Damaged Fuel with 1.2 kW per Assembly for the NUHOMS[®]-32PTH1 DSC (Fuel without CCs)

(Minimum required years of cooling time after reactor core discharge)

Dum Hu										Max	imu	m A.	ssei	mbly	v Aı	vera	ge I	nitia	l U-	235	Enri	chm	ent, 1	wt. %	6				-							
Burn Op, GWD/MTU	0.7 0.8 0.9	1 1.1 1.	2 1.3 1.4	4 1.5	1.6 1.	7 1.8	1.9	2 2	2.12.	.2 2.3	2.4	2.5 2	.62	2.72.	.8 2.	93	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5
10	3.0 3.0 3.0 3	1.0 3.0 3.	0 3.0 3.0	3.0	3.0 3.	0 3.0	3.0	3.0 3	3.0 3.	.0 3.0	3.0	3.0 3	1.0 3	3.0 3.	.0 3.	0 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0 3.0 3.0 3	3.0 3.0 3.	0 3.0 3.0	0 3.0	3.0 3.	0 3.0	3.0	3.0 3	3.0 3.	.0 3.0	3.0	3.0 3	1.0	3.0 3.	.0 3.	0 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.5 3.5 3.5 3	.5 3.5 3.	5 3.0 3.0	3.0	3.0 3.	0 3.0	3.0	3.0 3	3.0 3.	.0 3.0	3.0	3.0 3	0.0	3.0 3 .	.0 3.	0 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25				3.5	3.5 3.	5 3.5	3.5	3.5 3	3.5 3.	.5 3.5	3.5	3.5 3	3.5 3	3.5 3.	.5 3.	5 3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28				4.0	4.0 4.	0 4.0	4.0	4.0 4	1.0 3.	.5 3.5	3.5	3.5 3	5 3	3.5 3.	.5 3.	5 3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
30				4.5	4.5 4.	5 4.0	4.0	4.0 4	1.0 4.	.0 4.0	4.0	4.0 4	.04	1.0 4.	.0 4.	0 4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3,5	3.5	3.5	3.5
32				5.0	5.0 4.	5 4.5	4.5	4.5 4	1.5 4.	.5 4.0	4.0	4.0 4	04	1.0 4	.0 4.	0 4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
34	Distant statute statut		-	5.5	5.5 5.	0 5.0	5.0	5.0 4	1.5 4.	.5 4.5	4.5	4.5 4	.5 4	1.5 4.	.5 4.	5 4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
36	Transformation (and a state of the state of	in the Second		6.0	6.0 5.	5 5.5	5.5	5.5 5	5.0 5.	.0 5.0	5.0	5.0 5	5.0 5	5.0 5.	.0 5.	0 5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5 [.]	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
38	huundingstatistikan		alan kanalaran kanalaran	6.5	6.5 6.	0 6.0	6.0	6.0 5	5.5 5.	.5 5.5	5.5	5.5 5	5.5 5	5.5 5.	.5 5.	5 5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5
39	Trontangermanners			7.0	6.5 6.	5 6.5	6.0	6.0 E	5.0 6.	.0 6.0	5.5	5.55	5.5 5	5.5 5.	5 5.	5 5,5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
. 40		ala a nan an kanana	an constanting	7.0	7.0 6.	5 6.5	6.5	6.5 6	5.0 6.	.0 6.0	6.0	6.0 6	i.0 E	6.0 5.	.5 5.	5 5.5	5.5	5,5	5.5	5,5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0
41		alla voltanantua	in manufiliantini	7.5	7.0 7.	0 7.0	6.5	6,56	5,56.	5 6.0	6.0	6.0 6	<u>.0</u> 6	6.0 6.	.0 6.	0 6.0	6.0	6.0	5.5	5.5	5.5	5.5	5,5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
42		ita ana ang ang ang ang ang ang ang ang an		nauthalteri	an distanti di second	Salating and a second	ië Rochellenders	gouronag	ana ana	ad a stand a st	hadaniiu v	unumm a sii	SALTER E	6,06.	.06.	0 6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
43	niri dalamanana	สมถึงจะมัสมนักจะเหล	an satura satiriti	മാനമായായ	anaaninin ma	പാഞ്ഞ്ഞി	ംഡത്തം മണ	മനവാൾക്ക്	nan kan		مسموتهم	uu tahun saha	endia e	<u>6.5</u> 6.	.56.	0 6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5
44	க்காருக்காணித்துறைத்தில் கான	روسيديونونونونونونونونونونونونو مورونونونونونونونونونونونونونونونونونونو	الكرزورد سراسي موجوع	Tanga Malana ag	uitaingan thagan	anana		u an hindara	mination		ക്കാപംഹാ	anan	<u>6</u>	ô.5 6.	.56.	5 6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
45	ann an the state of the state o		ageunia.Strethtma	สพัฒนาสีมีละจ	പ്രവർത്തിനം അ	مىسىمەن			ามนับวิจารกร	simaziona	ar-drawa.com	www.www.	E	6,56.	.56.	5 6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
46	ունոնԾուրովորումին սունություն	ngan sanan na mada	an and a second seco	nie anni a cui	ودودمهمممودي	Xummuda	Carabia - Area	പറത്തി	10700000000	n aan ahaa ah	وملكب ملاقط	an contraction		7.0 7.	.0 7.	0 7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0
47	10000000000000000000000000000000000000	hán t hấn t hủ cá	ண்கவற்றாக ோ ண்	manan.	3 081 421427	11-0.0020	a.aaa.		Minai-indi			រីរ៉្នា ជិះឈេមកំព	n	7,5 7.	.5 7.	5 7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
48		Max and a star of a star of a		2010-0000211:	utira.		an Quittand			Contradiona.com	atonos,	കുർത്രംത	<u> </u>	3,0 8.	.0 8.	0 8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5
49	atter and spin and s		nancourring			nsamo		ano (1240	ananaių	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	astraar. 2	anna an	aatarii			8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7,5	7.5	7.5	7.0	7.0	7.0	7.0
50	a (po Normania) and an an an	anim Countrie 2/76	an ann an	nanta ana ang	(4).49	a, waalaatayo	CONTRACTOR AND	tere san		ສຸຂຸມສາຍສາຍ	anatorino.	alim Mata	17 00001 0 77		നായമാഹാർ	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7,5	7.5	7.5
57	an generation of the second	MMR.DuDike	8-പ്രതിഷങ്ങിനുന്നത്.	name un mai	in straating	DUMOTIO	ang	1988-00-00-00-00-00-00-00-00-00-00-00-00-0	1. and	winicana -	1018-1017-20-	a definitação da	athriven	mpa nat na	stutter	9.0	9.0	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5
52					ijom overza	08:00028:	officiality		amariketiketik	2010-12.008	11292Chai	x	anando 11	ichailtead	ubircus	anatti an	9.5	9.5	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
51	anna a agus ann an	and and a state of the state of	n an air an	Shintanini		an a	900-220-C	لاب مثناني ا	anussa attaus	Million Ca	enstaa	attatan 1940.	16.002°0-	9000 (P20)2	975 a ana	utitiontitie	9.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.0
55	KARABORINIZAT YARAD. (VIA)	** 		แล้งสาวเปล่าปร					1đata	aducti. a.a.				1 ******	10070318	oraniani		10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
56		∞ Not	e: If irr	radia	ited s	tain	less	stee	el ro	ds a	re p	rese	nt	10057702	uterana	1111-1112-11 1111-1112-11	2002230C	11.0	10.5	10.5	10.5	10.0	10.0	10.0	10.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.0	9.0	9.0
57	ana ana ang ang ang ang ang ang ang ang	∞ in th	he recor	nstiti	ited f	uel	asse	mbl	у, а	dd ai	n			10000	2200-1270X	teat and a		11.0	11.0	11.0	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.0	10.5	10.0	10.0	10.0	10.0	9.5	9.5	9.5
58	Anthrough an and a start of the st	∞ add	itional	year	of co	olin	ıg tin	ne f	or c	oolii	ng ti	mes		418500	anderster A	anerone:		titi anga		11.5	11.5	17.0	17.0	11.0	11.0	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.0
50		📰 less	than 10	0 yea	IFS.									slatina	910711222	aparatter	ığınında			12.5	12.0	12.0	12.0	11.5	17.5	17.5	11.5	11.0	17.0	11.0	11.0	11.0	11.0	10.5	10.5	10.5
	sapperaturation and the second statements	25												Bergeren	alla baar		i dartikani	iogenauty		13.0	13.0	12.5	12.0	12.5	12.0	12.0	12.0	12.0	12.0	17.5	17.5	17.5	17.5	17.0	17.0	12.0
61	Laborator and commissioning	\$	unen bistad vij tenda og k	l Naggybangoj	97.000 CC	iatruitais		ta anna ann an	1.111 10000	r // 200 7/10 /11	mere Odør	90:10math	an taan		de votete	angadunak) Selenan	28wihindon	ang Sing an	13.5	13.0	13.0	13.0 12 E	14.0	13.0	13.0	12.0	12.0	12.0	12.5	12.0	12.0	12.0	12.0	12.0	12.0
62	D. III IN MARCHINE STATE	angeringskerstande		mine	y halv til gan	196.000	Çirinan dired				N K BINDE	(Read)	initer with	inflational	neant	en Gradout	Alt and the		9	14.5	14.0	14.0	13.5	14.0	13.5	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.5	12.5	12.5	12.5
02																				10.0	15.0	15.0	14.5	14.5	14.5	14.5	14.0	14.0	14.0	13.5	13.5	13.5	13.0	13.0	13.0	13.0



Table 1-5f

PWR Fuel Qualification Table for Zone 6 Fuel with 1.5 kW per Assembly for the NUHOMS[®]-32PTH1 DSC (Fuel without CCs)

(Minimum required years of cooling time after reactor core discharge)

Burn												`				-	Max	imum	Ass	embly	Ave	rage	Initia	I U-2:	35 En	richm	ent, v	wt. %				0 /												
UP, GWD/	07	0.8	100	10) 1 1	1 1	2 1 3	3 1 4	15	16	17	18	19	20	21	22	23	24	25	26	27	2.8	20	30	31	32	33	34	3.5	3.6	37	3.8	30	40	41	12	43	4 4	45	46	47	4.8	40	5.0
MTU	0.7	0.0			· / ···				1.0	1		1.0	1.0	2.0	2	L L	2.0	£	2.0	2.0	2.1	2.0	2.0	0.0	0.7	0.2	0.0	0.7	0.0	0.0	0.7	0.0	0.0	7.0	7.1	7.2	7.0	7.7	7.0	7.0	7.7	7.0	7.3	
10	3.0	3.0	3.0	3.0) 3.0	7 3.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3.0	3.0	3.0	3.0) 3.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.0	3.0	3.0	3.0) 3.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25	un.nyun			muran				narraineanaig	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28		S amundy		d <u>a setteter</u>	- CALINIARS		ranner Britt		3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30		www.com				antan an			3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32	100-04-40		ane constants			anana		marma	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
34	materia	ennnaa	mannan	notechnic	unumun	nomann	որտոելյել	mpropurges	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
36	Indune	munann	avaturua	anntinant	nimumm	nummur	murrouna	atoma any	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
38	mannan	ounner	n an manage	metageni		wananawa	mounter	notentitute	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3,5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
39	Internet							an to an over	5,0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
40				maaaa		e retunnter			5.5	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5
41	namou		1111101111111		70000000	0.000022014		the second se	5.5	5.5	5.5	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
42		warmoou	100000			angenis and		anna ann ann ann ann ann ann ann ann an			and an and a state of the	(dto)au(au					manadmut	ofference of	maturbus		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
43	nonnoin	marin	ultimuteri	mannaisa	tiocommu	ilium result		1941900000000000	thom the sum	untri-I funion	maution	modiamate	*****		101100000	handeringen	- Manatan	and and a second second	u nomenator	tildananin	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
44		in wronge		annaharin.																	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0
45								amaanaa			- and and the				pariaaging		-citaininin				5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
46	. A LE		anonen en																		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
47									and and a second			i pinene nile	4443444444340	of the second second		una game	-trituntnin			ai duundu	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5:0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
48	nunninp			annodinn			ndfaffaffaffaffaffaffaffaffaffaffaffaffaf	uprositing to			nunosau	anna ann	10000000000	000000000000000000000000000000000000000	nin anomo	ommunuum	eunniini	100000000	urananan	- and	5.5	5:5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5
49																				·				5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
50	Joggwalls			-			in the second										operander and the	and an office of the second				and the second		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
51																								6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0
52	*******																								6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
53	Dunamaza		112-11-12-14-2		and the second sec							10,122.014					642-11-000-00						1.000000000		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
54	. Alexandre de											ainne a					condonado lo	۳	duummiku	*		2300 <u>2</u> 2000				6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5
55					Note	e: 1	f irre	adia	ted s	taini	less.	stee	l roc	ls ar	e pr	eser	ıt							an a		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
56	2.00000		-	2020	in tl	he ri	econ	stitu	ted f	uel c	issei	nbly	, ad	ld ar	,							9470- <u>106-10</u> 4		din ann	ogoostarn	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0
.57					add	itiol	nal y	ear i	of co	olin	g tin	ne.									1 <u>1</u> 11122111111							7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
58	<u></u>																						orraniadad				12/12/12/04/2011	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5
59																												7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	7.0
60		allenger i.al	an Westalle										an) sandha.	·	TOTAL STOR									1999 	· *		Ì.	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0
61	tagara pi		promone an	acruminita.	and derived	and the second second	alan alaz		1000000000		awa.ajarar	nativé vezz	arai <mark>ldan</mark> ar	ana (pone)	lezeb enclui	ngaanutub	Court Second	an a		arznene,	1002040143	artice sound	a rtheor tai	0200000 <u>0</u> 20000	diana and		annia tuna	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
62		-100 (d)			anrorana				20000000000	and the second secon	- Transfords			allageringere		nn <i>itheol</i> te	<u></u>	and and a second se			. 1000,000				or an	- 2000 (200 <u>7</u>		8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5

Notes: Tables 1-5a through 1-5f

- Burnup = Assembly Average burnup.
- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- For a fuel assembly with Control Components, for a given enrichment and burnup, increase the cooling time obtained from an *FQT* by one year.
- Fuel with an assembly average initial enrichment less than 0.7 (or less than the minimum provided above for each burnup) and greater than 5.0 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 62 GWd/MTU is unacceptable for storage.
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 3-years cooling.
- See Figure 1-26 through Figure 1-28 for a description of the Heat Load Zones.
- For reconstituted fuel assemblies with UO_2 rods and/or Zr rods or Zr pellets and/or stainless steel rods, use the assembly average equivalent enrichment to determine the minimum cooling time.
- The cooling times for damaged and intact assemblies are identical.
- Example: An intact fuel assembly without CCs, with a decay heat load of 1.5 kW or less, an initial enrichment of 3.65 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a 4.0 year cooling time as defined by 3.6 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) in Table 1-5f. If the fuel assembly has CCs, the minimum cooling time is increased by an additional one year, resulting in five year minimum cooling time prior to storage.





	0.87	0.87	0.87	0.87	
0.87	0.63	0.63	0.63	0.63	0.87
0.87	0.63	0.63	0.63	0.63	0.87
0.87	0.63	0.63	0.63	0.63	0.87
0.87	0.63	0.63	0.63	0.63	0.87
	0.87	0.87	0.87	0.87	
				F5483	

Figure 1-2 Heat Load Zoning Configuration 1 for the NUHOMS[®]-32PT DSC

:	1.2	0.6	0.6	1.2	
1.2	0.6	0.6	0.6	0.6	1.2
0.6	0.6	0.6	0.6	0.6	0.6
[.] 0.6	0.6	0.6	0.6	0.6	0.6
1.2	0.6	0.6	0.6	0.6	1.2
	1.2	0.6	0.6	1.2	
			F	5485	

Figure 1-3 Heat Load Zoning Configuration 2 for the NUHOMS[®]-32PT DSC

	0.7	0.7	0.7	0.7	
0.7	0.7	0.7	0.7	0.7	0.7
0.7	0.7	0.7	0.7	0.7	0.7
0.7	0.7	0.7	0.7	0.7	0.7
0.7	0.7	0.7	0.7	0.7	0.7
	0.7	0.7	0.7	0.7	
(L)

Figure 1-4 Heat Load Zoning Configuration 3 for the NUHOMS[®]-32PT DSC



Figure 1-5 Required PRA Locations for the NUHOMS[®]-32PT DSC Configuration with Four PRAs

Ξ,



Or



Figure 1-6 Required PRA Locations for the NUHOMS[®]-32PT DSC Configuration with Eight PRAs



Figure 1-7 Required PRA Locations for the NUHOMS[®]-32PT DSC Configuration with Sixteen PRAs



	Zone 1	Zone 2	Zone 3
Maximum Decay Heat (kW/FA)	0.7	1	1.3
Maximum Decay Heat per Zone (kW)	2.8	10.8	10.4

Figure 1-8 Heat Load Zoning Configuration for Fuel Assemblies (with or without BPRAs) Stored in NUHOMS[®]-24PHB DSC – Configuration 1



	Zone 1	Zone 2	Zone 3
Maximum Decay Heat (kW/FA)	N/A	N/A	1.3
Maximum Decay Heat per Zone (kW)	N/A	N/A	24.0

Figure 1-9

Heat Load Zoning Configuration for Fuel Assemblies (with or without BPRAs) Stored in NUHOMS[®]-24PHB DSC – Configuration 2



Linear Interpolation allowed between points

Initial Enrichment	Boron Loading, ppm
≤ 4.0	2350
4.1	2470
4.2	2580
4.3	2700
4.4	2790
4.5	2950

Figure 1-10 Soluble Boron Concentration vs. Fuel Initial U-235 Enrichment for the 24PHB System



	Zone 1	Zone 2	Zone 3	Zone 4
Maximum Decay Heat (kW/FA)	1.7	N/A	N/A	N/A
Maximum Decay Heat per Zone (kW)	40.8	N/A	N/A	N/A

Figure 1-11 Heat Load Zoning Configuration No. 1 for 24PTH-S and 24PTH-L DSCs (with or without Control Components)



	Zone 1	Zone 2	Zone 3	Zone 4
Maximum Decay Heat (kW/FA)	N/A	. 2	N/A	N/A
Maximum Decay Heat per Zone (kW)	N/A	40	N/A	N/A

Figure 1-12 Heat Load Zoning Configuration No. 2 for 24PTH-S and 24PTH-L DSCs (with or without Control Components)



	Zone 1	Zone 2	Zone 3	Zone 4
Maximum Decay Heat (kW/FA)	N/A.	2	1.5	N/A
Maximum Decay Heat per Zone (kW)	N/A	16	24	N/A





	Zone 1	Zone 2	Zone 3	Zone 4
Maximum Decay Heat (kW/FA)	N/A	N/A	N/A	1.3
Maximum Decay Heat per Zone (kW)	N/A	N/A	N/A	31.2




	Zone 1	Zone 2	Zone 3	Zone 4
Maximum Decay Heat (kW/FA)	N/A	N/A	1.5	1.3
Maximum Decay Heat per Zone (kW)	N/A	N/A	Note 1	10.4

Notes:

- 1. Fuel assemblies with a maximum heat load of 1.5 kW are permitted in Zone 3 as long as the total of 24 kW/canister maximum heat load is maintained.
- 2. This configuration is applicable to Basket Types 2A, 2B, or 2C only (without aluminum inserts).

Figure 1-15

Heat Load Zoning Configuration No. 5 for 24PTH-S-LC DSC (with or without Control Components)



Notes:

- 1. Locations identified as "A" are for placement of up to 8 damaged or intact fuel assemblies.
- 2. Locations identified as "B" are for placement of up to 4 additional damaged or intact fuel assemblies (Maximum of 12 damaged fuel assemblies allowed, Locations "A" and "B" combined).
- 3. Locations identified as "C" are for placement of up to 12 intact fuel assemblies, including 4 empty slots in the center as shown in Figure 1-12.

Figure 1-16 Location of Damaged Fuel Inside 24PTH DSC

			ZONE 3	ZONE 3	ZONE 3		_	
	ZONE 3							
	ZONE 3							
ZONE 3								
ZONE 3								
ZONE 3								
	ZONE 3							
	ZONE 3							
			ZONE 3	ZONE 3	ZONE 3			

I

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6		
Maximum Decay Heat (kW/FA)	NA	NA	0.393	NA	NA	NA		
Maximum Decay Heat per Zone (kW)	NA	NA	22.0	NA	NA	NA		
Maximum Decay Heat per DSC (kW)	22.0							

Note: This configuration is not allowed for a Type 1 61BTH DSC with MMC or Boral[®] Poison Plates.

Figure 1-17 Heat Load Zoning Configuration No. 1 for Type 1 or Type 2 61BTH DSCs

			ZONE 5	ZONE 5	ZONE 5	· ·		. <i>.</i>
	ZONE 4							
	ZONE 4	ZONE 2	ZONE 4					
ZONE 5	ZONE 4	ZONE 2	ZONE 4	ZONE 5				
ZONE 5	ZONE 4	ZONE 2	ZONĘ 4	ZONE 5				
ZONE 5	ZONĖ 4	ZONE 2	ZONE 4	ZONE 5				
	ZONE 4	ZONE 2	ZONE 4					
	ZONE 4							
			ZONE 5	ZONE 5	ZONE 5			• •

. ,	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6		
Maximum Decay Heat (kW/FA)	NA	0.35	NA	0.48	0.54	NA		
Maximum Decay Heat per Zone (kW)	NA	8.75	NA	11.52	6.48	NA		
Maximum Decay Heat per DSC (kW)	22.0 ⁽²⁾							

Note 1: This configuration is not allowed for a Type 1 61BTH DSC with MMC or Boral[®] Poison Plates. Note 2: Adjust payload to maintain total DSC heat load within the specified limit.

Figure 1-18 Heat Load Zoning Configuration No. 2 for Type 1 or Type 2 61BTH DSCs

						1		
			ZONE 2	ZONE 2	ZONE 2			
	ZONE 2							
	ZONE 2							
ZONE 2								
ZONE 2								
ZONE 2								
	ZONE 2							
	ZONE 2							
			ZONE 2	ZONE 2	ZONE 2			-

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6		
Maximum Decay Heat (kW/FA)	NA	0.35	NA	NA	NA	NA		
Maximum Decay Heat per Zone (kW)	NA	19.4	NA	NA	NA	NA		
Maximum Decay Heat per DSC (kW)	19.4							

Note: This configuration does not have any restrictions as to the applicable Basket Poison Plates.

Figure 1-19 Heat Load Zoning Configuration No. 3 for Type 1 or Type 2 61BTH DSCs

						1		
	•		ZONE 5	ZONE 5	ZONE 5	1		
•	ZONE 4	ZONE 4	ZONE 4	ZONE 4	ZONE 4	ZONE 4	ZONE 4	
:	ZONE 4	ZONE 2	ZONE 4					
ZONE 5	ZONE 4	ZONE 2	ZONE 1	ZONE 1	ZONE 1	ZONE 2	ZONE 4	ZONE 5
ZONE 5	ZON <u>E</u> 4	ZONE 2	ZONE 1	ZONE 1	ZONE 1	ZONE 2	ZONE 4	ZONE 5
ZONE 5	ZONE 4	ZONE 2	ZONE 1	ZONE 1	ZONE 1	ZONE 2	ZONE 4	ZONE 5
	ZONE 4	ZONE 2	ZONE 4					
	ZONE 4	ZONE 4	ZONE 4	ZONE 4	ZONE 4	ZONE 4	ZONE 4	
·			ZONE 5	ZONE 5	ZONE 5			-

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Maximum Decay Heat (kW/FA)	0.22	0.35	NA	0.48	0.54	NA
<i>Maximum Decay Heat per Zone (kW)</i>	1.98	5.60	NA	11.52	6.48	NA
Maximum Decay Heat per DSC (kW)			19	.4 ⁽²⁾		

Note 1: This configuration does not have any restrictions as to the applicable Basket Poison Plates. Note 2: Adjust payload to maintain total DSC heat load within the specified limit.

Figure 1-20 Heat Load Zoning Configuration No. 4 for Type 1 or Type 2 61BTH DSCs

						-		
			ZONE 5	ZONE 5	ZONE 5			
	ZONE 5							
	ZONE 5							
ZONE 5	ZONE 5	ZONE 5	ZONE 2	ZONE 2	ZONE 2	ZONE 5	ZONE 5	ZONE 5
ZONE 5	ZONE 5	ZONE 5	ZONE 2	ZONE 2	ZONE 2	ZONE 5	ZONE 5	ZONE 5
ZONE 5	ZONE 5	ZONE 5	ZONE 2	ZONE 2	ZONE 2	ZONE 5	ZONE 5	ZONE 5
	ZONE 5							
	ZONE 5							
			ZONE 5	ZONE 5	ZONE 5			-

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6		
Maximum Decay Heat (kW/FA)	NA	0.35	NA	NA	0.54	NA		
Maximum Decay Heat per Zone (kW)	NA	3.15	NA	ŅA	28.08	NA		
<i>Maximum Decay Heat per DSC (kW)</i>	31.2 ⁽²⁾							

Note 1: This configuration is applicable to a Type 2 61BTH DSC only with Borated Aluminum Poison Plates. Note 2: Adjust payload to maintain total DSC heat load within the specified limit.

Figure 1-21 Heat Load Zoning Configuration No. 5 for Type 2 61BTH DSCs

						1		
	-		ZONE 5	ZONE 5	ZONE 5			
	ZONE 4							
	ZONE 4	ZONE 6	ZONE 4					
ZONE 5	ZONE 4	ZONE 6	ZONE 1	ZONE 1	ZONE 1	ZONE 6	ZONE 4	ZONE 5
ZONE 5	ZONE 4	ZONE 6	ZONE 1	ZONE 1	ZONE 1	ZONE 6	ZONE 4	ZONE 5
ZONE 5	ZONE 4	ZONE 6	ZONE 1	ZONĘ 1	ZONE 1	ZONE 6	ZONE 4	ZONE 5
	ZONE 4	ZONE 6	ZONE 4					
	ZONE 4							
			ZONE 5	ZONE 5	ZONE 5			

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Maximum Decay Heat (kW/FA)	0.22	NA	NA	0.48	0.54	0.70
Maximum Decay Heat per Zone (kW)	1.98	NA	NA	11.52	6.48	11.20
Maximum Decay Heat per DSC (kW)			31	. 2 ⁽²⁾		

Note 1: This configuration is applicable to a Type 2 61BTH DSC only with Borated Aluminum Poison Plates. Note 2: Adjust payload to maintain total DSC heat load within the specified limit.

Figure 1-22 Heat Load Zoning Configuration No. 6 for Type 2 61BTH DSCs

			ZONE 5	ZONE 5	ZONE 5			_
	ZONE 5							
	ZONE 5	ZONE 4	ZONE 5					
ZONE 5	ZONE 5	ZONE 4	ZONE 5	ZONE 5				
ZONE 5	ZONE 5	ZONE 4	ZONE 5	ZONE 5				
ZONE 5	ZONE 5	ZONE 4	ZONE 5	ZONE 5				
	ZONE 5	ZONE 4	ZONE 5					
	ZONE 5							
			ZONE 5	ZONE 5	ZONE 5			

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Maximum Decay Heat (kW/FA)	NA	NA	NA	0.48	0.54	NA
Maximum Decay Heat per Zone (kW)	NA	NA	NA	12.00	19.44	NA
Maximum Decay Heat per DSC (kW)			31	.2 ⁽²⁾		

Note 1: This configuration is applicable to a Type 2 61BTH DSC only with Borated Aluminum Poison Plates. Note 2: Adjust payload to maintain total DSC heat load within the specified limit.

Figure 1-23 Heat Load Zoning Configuration No. 7 for Type 2 61BTH DSCs

			ZONE 5	ZONE 5	ZONE 5			_
	ZONE 4							
	ZONE 4	ZONE 3	ZONE 4					
ZONE 5	ZONE 4	ZONE 3	ZONE 2	ZONE 2	ZONE 2	ZONE 3	ZONE 4	ZONE 5
ZONE 5	ZONE 4	ZONE 3	ZONE 2	ZONE 2	ZONE 2	ZONE 3	ZONE 4.	ZONE 5
ZONE 5	ZONE 4	ZONE 3	ZONE 2	ZONE 2	ZONE 2	ZONE 3	ZONE 4	ZONE 5
	ZONE 4	ŻONE 3	ZONE 4					
	ZONE 4							
			ZONE 5	ZONE 5	ZONE 5			

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Maximum Decay Heat (kW/FA)	NA	0.35	0.393	0.48	0.54	NA
<i>Maximum Decay Heat per Zone (kW)</i>	NA	3.15	6.288	11.52	6.48	NA
<i>Maximum Decay Heat per DSC (kW)</i>			27	.4 ⁽²⁾		

Note 1: This configuration is applicable to a Type 2 61BTH DSC only with Borated Aluminum or MMC or Boral[®] Poison Plates.

Note 2: Adjust payload to maintain total DSC heat load within the specified limit.

Figure 1-24 Heat Load Zoning Configuration No. 8 for Type 2 61BTH DSCs



- Note 1: These corner locations shall only be used to load up to four damaged assemblies with the remaining intact in a 61BTH Basket. The maximum lattice average initial enrichment of assemblies (damaged or intact stored in the 2x2 cells) is limited to the "up to 4 damaged assemblies" column of Table 1-1w.
- Note 2: If loading more than four damaged assemblies, place first four damaged assemblies in the corner locations per Note 1, and up to 12 additional damaged assemblies in these interior locations, with the remaining intact in a 61BTH Basket. The maximum lattice average initial enrichment of assemblies (damaged or intact stored in the 2x2 cells) is limited to the "Five or More Damaged Assemblies" column of Table 1-1w.

Figure 1-25 Location of Damaged Fuel Inside 61BTH DSC

	Zone 6	Zone 6	Zone 6	Zone 6	
Zone 6	Zone 5	Zone 5	Zone 5	Zone 5	Zone 6
Zone 6	Zone 5	Zone 1 [*]	Zone 1 [*]	Zone 5	Zone 6
Zone 6	Zone 5 [*]	Zone 1	Zone 1 [*]	Zone 5	Zone 6
Zone 6	Zone 5 [*]	Zone 5	Zone 5 [*]	Zone 5 [*]	Zone 6
	Zone 6	Zone 6	Zone 6	Zone 6	

* denotes location where intact or damaged fuel assembly can be stored.

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Max. Decay Heat / FA (kW)	0.6	N/A	N/A	N/A	1.3 ⁽¹⁾	1.5
Max. Decay Heat / Zone (kW)	2.4	N/A	N/A	N/A	15.6	24.0
Max. Decay Heat / DSC (kW)			40.	8 ⁽²⁾		

Notes: (1) 1.2 kW per FA is the maximum decay heat allowed for damaged fuel assemblies. (2) Adjust payload to maintain 40.8 kW heat load.

Figure 1-26 Heat Load Zoning Configuration No. 1 for 32PTH1-S, 32PTH1-M and 32PTH1-L DSCs (Type 1 Baskets)

	Zone 4	Zone 4	Zone 4	Zone 4	
Zone 4	Zone 4	Zone 4	Zone 4 [*]	Zone 4	Zone 4
Zone 4	Zone 4	Zone 3	Zone 3	Zone 4	Zone 4
Zone 4	Zone 4	Zone 3 [*]	Zone 3	Zone 4	Zone 4
Zone 4	Zone 4	Zone 4	Zone 4	Zone 4	Zone 4
	Zone 4	Zone 4	Zone 4	Zone 4	

* denotes location where intact or damaged fuel assembly can be stored.

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Max. Decay Heat / FA (kW)	N/A	N/A	0.96 ⁽²⁾	0.98 ⁽²⁾	N/A	N/A
Max. Decay Heat / Zone (kW)	N/A	N/A	3.84	27.44	N/A	N/A
Max. Decay Heat / DSC (kW)			31.	2 ⁽¹⁾		

Note: (1) Adjust payload to maintain 31.2 kW heat load.

(2) The fuel qualification table corresponding to 1.0 kW/FA shall be used to determine burnup, cooling time, and enrichments corresponding to these heat loads.

Figure 1-27 Heat Load Zoning Configuration No. 2 for 32PTH1-S, 32PTH1-M and 32PTH1-L DSCs (Type 1 or Type 2 Baskets)

	Zone 2	Zone 2	Zone 2	Zone 2	
Zone 2					
Zone 2					
Zone 2					
Zone 2					
	Zone 2	Zone 2	Zone 2	Zone 2	

* denotes location where intact or damaged fuel assembly can be stored.

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Max. Decay Heat / FA (kW)	N/A	0.8	N/A	N/A	N/A	N/A
Max. Decay Heat / Zone (kW)	N/A	24.0	N/A	N/A	N/A	N/A
Max. Decay Heat / DSC (kW)			24.	O ⁽¹⁾		

Note:

(1) Adjust payload to maintain 24.0 kW heat load.

Figure 1-28 Heat Load Zoning Configuration No. 3 for 32PTH1-S, 32PTH1-M and 32PTH1-L DSCs (Type 1 or Type 2 Baskets)

1.2.2 DSC Vacuum Pressure During Drying

	Vacuum Pressure: ≤3 mm Hg
	Time at Pressure: ≥30 minutes following evacuation
	Number of Pump-Downs: 2
Applicability:	This is applicable to all DSCs. The term "inner top cover" as used in this and other Technical Specifications means either the inner top cover plate or the top shield plug assembly.
Objective:	To ensure a minimum water content.
Action:	If the required vacuum pressure cannot be obtained:
	1. Confirm that the vacuum drying system is properly installed.
	2. Check and repair, or replace, the vacuum pump.
	3. Check and repair the system as necessary.
	4. Check and repair the seal weld between the inner top cover and the DSC shell.
Surveillance:	No maintenance or tests are required during normal storage. Surveillance of the vacuum gauge is required during the vacuum drying operation.
Bases:	A stable vacuum pressure of ≤ 3 mm Hg further ensures that all liquid water has evaporated in the DSC cavity, and that the resulting inventory of oxidizing gases in the DSC is well below the 0.25 volume %.

1.2.3 24P and 52B DSC Helium Backfill Pressure

Limit/Specifications:

1

	Helium 2.5 $psig \pm 2.5$ $psig$ backfill pressure (stable for 30 minutes after filling).
Applicability:	This specification is applicable to 24P and 52B DSCs only.
Objective:	To ensure that: (1) the atmosphere surrounding the irradiated fuel is a non-oxidizing inert gas; (2) the atmosphere is favorable for the transfer of decay heat.
Action:	If the required pressure cannot be obtained:
	 Confirm that the vacuum drying system and helium source are properly installed.
	2. Check and repair or replace the pressure gauge.
	3. Check and repair or replace the vacuum drying system.
	4. Check and repair or replace the helium source.
	5. Check and repair the seal weld between the inner top cover and the DSC shell.
	If pressure exceeds the criterion, release a sufficient quantity of helium to lower the DSC cavity pressure.
Surveillance:	No maintenance or tests are required during the normal storage. Surveillance of the pressure gauge is required during the helium backfilling operation.
Bases:	The value of 2.5 psig was selected to ensure that the pressure within the DSC is within the design limits during any expected normal and off- normal operating conditions.

1.2.3a 61BT, 32PT, 24PHB, 24PTH, 61BTH and 32PTH1 DSC Helium Backfill Pressure

Limit/Specifications: Helium 2.5 $psig \pm 1.0$ psig backfill pressure (stable for 30 minutes after)filling). This specification is applicable to 61BT, 32PT, 24PHB, 24PTH, 61BTH Applicability: and 32PTH1 DSC only. **Objective:** To ensure that: (1) the atmosphere surrounding the irradiated fuel is a non-oxidizing inert gas; (2) the atmosphere is favorable for the transfer of decay heat. Action: If the required pressure cannot be obtained: 1. Confirm that the vacuum drying system and helium source are properly installed. 2. Check and repair or replace the pressure gauge. 3. Check and repair or replace the vacuum drying system. 4. Check and repair or replace the helium source. 5. Check and repair the seal weld between the inner top cover and the DSC shell. If pressure exceeds the criterion, release a sufficient quantity of helium to lower the DSC cavity pressure. Surveillance: No maintenance or tests are required during the normal storage. Surveillance of the pressure gauge is required during the helium backfilling operation. Bases: The value of 2.5 psig was selected to ensure that the pressure within the DSC is within the design limits during any expected normal and offnormal operating conditions.

1.2.4 24P and 52B DSC Helium Leak Rate of Inner Seal Weld

	$\leq 1.0 \times 10^{-4}$ atm \cdot cubic centimeters per second (atm \cdot cm ³ /s) at the highest DSC limiting pressure.
Applicability:	This specification is applicable to the inner top cover seal weld of the 24P and 52B DSCs only.
Objective:	1. To limit the total radioactive gases normally released by each canister to negligible levels. Should fission gases escape the fuel cladding, they will remain confined by the DSC confinement boundary.
	2. To retain helium cover gases within the DSC and prevent oxygen from entering the DSC. The helium improves the heat dissipation characteristics of the DSC and prevents any oxidation of fuel cladding.
Action:	If the leak rate test of the inner seal weld exceeds 1.0×10^{-4} (atm \cdot cm ³ /s):
	1. Check and repair the DSC drain and fill port fittings for leaks.
	2. Check and repair the inner seal weld.
	3. Check and repair the inner top cover for any surface indications resulting in leakage.
Surveillance:	After the welding operation has been completed, perform a leak test with a helium leak detection device.
Bases:	If the DSC leaked at the maximum acceptable rate of 1.0×10^{-4} atm \cdot cm ³ /s for a period of 20 years, about 63,100 cc of helium would escape from the DSC. This is about 1% of the 6.3 x 10 ⁶ cm ³ of helium initially introduced in the DSC. This amount of leakage would have a negligible effect on the inert environment of the DSC cavity. (Reference: American National Standards Institute, ANSI N14.5-1987, For Radioactive Materials—Leakage Tests on Packages for Shipment," Appendix B3).

1.2.4a 61BT, 32PT, 24PHB, 24PTH, 61BTH and 32PTH1 DSC Helium Leak Rate of Inner Seal Weld

Limit/Specification:

 $\leq 1.0 \times 10^{-7}$ reference cubic centimeters per second (cc/s). Applicability: This specification is applicable to the inner top cover seal weld of 61BT, 32PT, 24PHB, 24PTH, 61BTH and 32PTH1 DSC only. **Objective:** To demonstrate that the top cover to be "leak tight", as defined in 1. "American National Standard for Leakage Tests on Packages for Shipment of Radioactive Materials," ANSI N14.5 - 1997. To retain helium cover gases within the DSC and prevent oxygen 2. from entering the DSC. The helium improves the heat dissipation characteristics of the DSC and prevents any oxidation of fuel cladding. If the leak rate test of the inner seal weld exceeds 1.0×10^{-7} reference cc/s: Action: 1. Check and repair the inner seal weld. 2. Check and repair the inner top cover for any surface indications resulting in leakage. Surveillance: After the welding operation has been completed, perform a leak test with a helium leak detection device. The 61BT, 32PT, 24PHB, 24PTH, 61BTH and 32PTH1 DSC will Bases: maintain an inert atmosphere around the fuel and radiological consequences will be negligible, since it is designed and tested to be leak tight.

1.2.5 DSC Dye Penetrant Test of Closure Welds

	All DSC closure welds except those subjected to full volumetric inspection shall be dye penetrant tested in accordance with the requirements of the ASME Boiler and Pressure Vessel Code Section III, Division 1, Article NB-5000. The liquid penetrant test acceptance standards shall be those described in Subsection NB-5350 of the Code.
Applicability:	This is applicable to all DSCs. The welds include inner and outer top and bottom covers, and vent and siphon port covers.
Objective:	To ensure that the DSC is adequately sealed in a redundant manner and leak tight.
Action:	If the liquid penetrant test indicates that the weld is unacceptable:
	1. The weld shall be repaired in accordance with approved ASME procedures.
	2. The new weld shall be re-examined in accordance with this specification.
Surveillance:	During DSC closure operations. No additional surveillance is required for this operation.
Bases:	Article NB-5000 Examination, ASME Boiler and Pressure Vessel Code, Section III, Division 1, Sub-Section NB.

1.2.6 Deleted

1.2.7 HSM Dose Rates with a Loaded 24P, 52B or 61BT DSC

	Dose rates at the following locations shall be limited to levels which are less than or equal to:
	a. 400 mrem/hr at 3 feet from the HSM surface.
	b. Outside of HSM door on center line of DSC 100 mrem/hr.
	c. End shield wall exterior 20 mrem/hr.
Applicability:	This specification is applicable to all HSMs which contain a loaded 24P, 52B or 61BT DSC.
Objective:	The dose rate is limited to this value to ensure that the cask (DSC) has not been inadvertently loaded with fuel not meeting the specifications in Section 1.2.1 and to maintain dose rates as-low-as-is-reasonably achievable (ALARA) at locations on the HSMs where surveillance is performed, and to reduce off-site exposures during storage.
Action:	a. If specified dose rates are exceeded, the following actions should be taken:
	1. Ensure that the DSC is properly positioned on the support rails.
	2. Ensure proper installation of the HSM door.
	3. Ensure that the required module spacing is maintained.
	4. Confirm that the spent fuel assemblies contained in the DSC conform to the specifications of Section 1.2.1.
	 Install temporary or permanent shielding to mitigate the dose to acceptable levels in accordance with 10 CFR Part 20, 10 CFR 72.104(a), and ALARA.
	 Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.
Surveillance:	The HSM and ISFSI shall be checked to verify that this specification has been met after the DSC is placed into storage and the HSM door is closed.
Basis:	The basis for this limit is the shielding analysis presented in Section 7.0, Appendix J, and Appendix K of the FSAR. The specified dose rates provide as-low-as-is-reasonably-achievable on-site and off-site doses in accordance with 10 CFR Part 20 and 10 CFR 72.104(a).

1.2.7a HSM Dose Rates with a Loaded 32PT DSC Only

	Dose rates at the following locations shall be limited to levels which are less than or equal to:
	a. 800 mrem/hr on the HSM front surface.
	b. 200 mrem/hr on the HSM door centerline.
	c. 8 mrem/hr on the end shield wall exterior.
Applicability:	This specification is applicable to all HSMs which contain a loaded 32PT DSC.
Objective:	The dose rate is limited to this value to ensure that the cask (DSC) has not been inadvertently loaded with fuel not meeting the specifications in Section 1.2.1 and to maintain dose rates as-low-as-is-reasonably achievable (ALARA) at locations on the HSMs where surveillance is performed, and to reduce off-site exposures during storage.
Action:	a. If specified dose rates are exceeded, the following actions should be taken:
	1. Ensure that the DSC is properly positioned on the support rails.
	2. Ensure proper installation of the HSM door.
	3. Ensure that the required module spacing is maintained.
	 Confirm that the spent fuel assemblies contained in the DSC conform to the specifications of Section 1.2.1.
	 Install temporary or permanent shielding to mitigate the dose to acceptable levels in accordance with 10 CFR Part 20, 10 CFR 72.104(a), and ALARA.
	 b. Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.
Surveillance:	The HSM and ISFSI shall be checked to verify that this specification has been met after the DSC is placed into storage and the HSM door is closed.
Basis:	The basis for this limit is the shielding analysis presented in Appendix M of the FSAR. The specified dose rates provide as-low-as-is-reasonably-achievable on-site and off-site doses in accordance with 10 CFR Part 20 and 10 CFR 72.104(a).

1.2.7b HSM Dose Rates with a Loaded 24PHB DSC Only

Limit/Specification:	Peak dose rates at the following locations shall be limited to levels which are less than or equal to:
	a. 500 mrem/hr on the HSM front surface.
	b. 20 mrem/hr on the HSM door centerline.
	c. 300 mrem/hr on the end shield wall exterior.
Applicability:	This specification is applicable to all HSMs which contain a loaded 24PHB DSC.
Objective:	The peak dose rate is limited to this value to ensure that the cask (DSC) has not been inadvertently loaded with fuel not meeting the specifications in Section 1.2.1 and to maintain dose rates as-low-as-is-reasonably achievable (ALARA) at locations on the HSMs where surveillance is performed, and to reduce off-site exposures during storage.
Action: a.	If specified dose rates are exceeded, the following actions should be taken:
	 Ensure that the DSC is properly positioned on the support rails. Ensure proper installation of the HSM door. Ensure that the required module spacing is maintained. Confirm that the spent fuel assemblies contained in the DSC conform to the specifications of Section 1.2.1. Install temporary or permanent shielding to mitigate the dose to acceptable levels in accordance with 10 CFR Part 20, 10 CFR 72.104(a), and ALARA.
b.	Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.
Surveillance:	The HSM and ISFSI shall be checked to verify that this specification has been met after the DSC is placed into storage and the HSM door is closed.
Basis:	The basis for this limit is the shielding analysis presented in Appendix N of the FSAR. The specified dose rates provide as-low-as-is-reasonably-achievable on-site and off-site doses in accordance with 10 CFR Part 20 and 10 CFR 72.104(a).

1.2.7c HSM-H Dose Rates with a Loaded 24PTH-S or 24PTH-L DSC Only

Limit/Specification:	Peak dose rates at the following locations shall be limited to levels which are less than or equal to:
	a. 1300 mrem/hr on the HSM-H front surface.
	b. 5 mrem/hr on the HSM-H door centerline.
	c. 10 mrem/hr on the end shield wall exterior.
Applicability:	This specification is applicable to all HSM-H modules which contain a loaded 24PTH-S or 24PTH-L DSC.
Objective:	The peak dose rate is limited to this value to ensure that the cask (DSC) has not been inadvertently loaded with fuel not meeting the specifications in Section 1.2.1 and to maintain dose rates as-low-as-is-reasonably achievable (ALARA) at locations on the HSM-H where surveillance is performed, and to reduce off-site exposures during storage.
Action: a.	If specified dose rates are exceeded, the following actions should be taken:
	 Ensure that the DSC is properly positioned on the support rails. Ensure proper installation of the HSM-H door. Confirm that the spent fuel assemblies contained in the DSC conform to the specifications of Section 1.2.1. Install temporary or permanent shielding to mitigate the dose to acceptable levels in accordance with 10 CFR Part 20, 10 CFR 72.104(a), and ALARA.
b.	Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.
Surveillance:	The HSM-H and ISFSI shall be checked to verify that this specification has been met after the DSC is placed into storage and the HSM-H door is closed.
Basis:	The basis for this limit is the shielding analysis presented in Appendix P of the FSAR. The specified dose rates provide as-low-as-is-reasonably-achievable on-site and off-site doses in accordance with 10 CFR Part 20 and 10 CFR 72.104(a).

1.2.7d HSM or HSM-H Dose Rates with a Loaded 24PTH-S-LC DSC Only

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Limit/Specification:	Peak dose rates at the following locations shall be limited to levels which are less than or equal to:
	a. 500 mrem/hr on the HSM or HSM-H front surface.
	b. 70 mrem/hr on the HSM or HSM-H door centerline.
	c. 300 mrem/hr on the end shield wall exterior.
Applicability:	This specification is applicable to all HSMs or HSM-Hs which contain a loaded 24PTH-S-LC DSC.
Objective:	The peak dose rate is limited to this value to ensure that the cask (DSC) has not been inadvertently loaded with fuel not meeting the specifications in Section 1.2.1 and to maintain dose rates as-low-as-is-reasonably achievable (ALARA) at locations on the HSMs or HSM-Hs where surveillance is performed, and to reduce off-site exposures during storage.
Action: a.	If specified dose rates are exceeded, the following actions should be taken:
	 Ensure that the DSC is properly positioned on the support rails. Ensure proper installation of the HSM or HSM-H door. Confirm that the spent fuel assemblies contained in the DSC conform to the specifications of Section 1.2.1. Install temporary or permanent shielding to mitigate the dose to acceptable levels in accordance with 10 CFR Part 20, 10 CFR 72.104(a), and ALARA.
b.	Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.
Surveillance:	The HSM or HSM-H and ISFSI shall be checked to verify that this specification has been met after the DSC is placed into storage and the HSM or HSM-H door is closed.
Basis:	The basis for this limit is the shielding analysis presented in Appendix P of the FSAR. The specified dose rates provide as-low-as-is-reasonably-achievable on-site and off-site doses in accordance with 10 CFR Part 20 and 10 CFR 72.104(a).

1.2.7e HSM-H Dose Rates with a Loaded Type 2 61BTH DSC Only

Limit/Specification:	Peak dose rates at the following locations shall be limited to levels which are less than or equal to:
	a. 700 mrem/hr on the HSM-H front surface.
	b. 5 mrem/hr on the HSM-H door centerline.
	c. 10 mrem/hr on the end shield wall exterior.
Applicability:	This specification is applicable to all HSM-H modules which contain a loaded Type 2 61BTH DSC.
Objective:	The peak dose rate is limited to this value to maintain dose rates as-low- as-is-reasonably achievable (ALARA) at locations on the HSM-H where surveillance is performed, and to reduce off-site exposures during storage.
Action: a.	If specified dose rates are exceeded, the following actions should be taken:
	 Ensure that the DSC is properly positioned on the support rails. Ensure proper installation of the HSM-H door. Confirm that the spent fuel assemblies contained in the DSC conform to the specifications of Section 1.2.1. Install temporary or permanent shielding to mitigate the dose to acceptable levels in accordance with 10 CFR Part 20, 10 CFR 72.104(a), and ALARA.
b.	Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.
Surveillance:	The HSM-H and ISFSI shall be checked to verify that this specification has been met after the DSC is placed into storage and the HSM-H door is closed.
Basis:	The basis for this limit is the shielding analysis presented in Appendix T of the FSAR. The specified dose rates provide as-low-as-is-reasonably-achievable on-site and off-site doses in accordance with 10 CFR Part 20 and 10 CFR 72.104(a).

1.2.7f HSM or HSM-H Dose Rates with a loaded Type 1 61BTH DSC Only

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Limit/Specification:	Peak dose rates at the following locations shall be limited to levels which are less than or equal to:
	a. 700 mrem/hr on the HSM or HSM-H front surface.
	b. 100 mrem/hr on the HSM or HSM-H door centerline.
	c. 20 mrem/hr on the end shield wall exterior.
Applicability:	This specification is applicable to all HSMs or HSM-Hs which contain a loaded Type 1 61BTH DSC.
Objective:	The peak dose rate is limited to this value to maintain dose rates as-low- as-is-reasonably achievable (ALARA) at locations on the HSMs or HSM- Hs where surveillance is performed, and to reduce off-site exposures during storage.
Action: a.	If specified dose rates are exceeded, the following actions should be taken:
	 Ensure that the DSC is properly positioned on the support rails. Ensure proper installation of the HSM or HSM-H door. Confirm that the spent fuel assemblies contained in the DSC conform to the specifications of Section 1.2.1. Install temporary or permanent shielding to mitigate the dose to acceptable levels in accordance with 10 CFR Part 20, 10 CFR 72.104(a), and ALARA.
b.	Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.
Surveillance:	The HSM or HSM-H and ISFSI shall be checked to verify that this specification has been met after the DSC is placed into storage and the HSM or HSM-H door is closed.
Basis:	The basis for this limit is the shielding analysis presented in Appendix T of the FSAR. The specified dose rates provide as-low-as-is-reasonably-achievable on-site and off-site doses in accordance with 10 CFR Part 20 and 10 CFR 72.104(a).

1.2.7g HSM-H Dose Rates with a 32PTH1 DSC Only

Limit/Specification:	Peak dose rates at the following locations shall be limited to levels which are less than or equal to:
	a. 500 mrem/hr on the HSM-H front surface.
	b. 5 mrem/hr on the HSM-H door centerline.
	c. 10 mrem/hr on the end shield wall exterior.
Applicability:	<i>This specification is applicable to all HSM-Hs which contain a loaded</i> 32PTH1 DSC.
Objective:	The peak dose rate is limited to this value to maintain dose rates as-low- as-is-reasonably achievable (ALARA) at locations on the HSM-Hs where surveillance is performed, and to reduce off-site exposures during storage.
Action: a.	If specified dose rates are exceeded, the following actions should be taken:
	 Ensure that the DSC is properly positioned on the support rails. Ensure proper installation of the HSM-H door. Confirm that the spent fuel assemblies contained in the DSC conform to the specifications of Section 1.2.1. Install temporary or permanent shielding to mitigate the dose to acceptable levels in accordance with 10 CFR Part 20, 10 CFR 72.104(a), and ALARA.
b.	Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.
Surveillance:	The HSM-H and ISFSI shall be checked to verify that this specification has been met after the DSC is placed into storage and the HSM-H door is closed.
Basis:	The basis for this limit is the shielding analysis presented in Appendix U of the FSAR. The specified dose rates provide as-low-as-is-reasonably-achievable on-site and off-site doses in accordance with 10 CFR Part 20 and 10 CFR 72.104(a).

1.2.8 HSM Maximum Air Exit Temperature with a Loaded 24P, 52B, 61BT, 32PT, 24PHB, 24PTH-S-LC or a Type 1 61BTH DSC Only

	Following initial DSC transfer to the HSM or the occurrence of accident conditions, the equilibrium air temperature difference between ambient temperature and the vent outlet temperature shall not exceed 100°F when fully loaded with 24 kW heat.
Applicability:	This specification is applicable to all HSMs stored in the ISFSI. If a DSC is placed in the HSM with a heat load less than 24 kW, the limiting difference between outlet and ambient temperatures shall be determined by a calculation performed by the user using the same methodology and inputs documents in the FSAR and SER.
Objective:	The objective of this limit is to ensure that the temperatures of the fuel cladding and the HSM concrete do not exceed the temperatures calculated in Section 8 of the FSAR. That section shows that if the air outlet temperature difference is less than or equal to 100° F (with a thermal heat load of 24 kW), the fuel cladding and concrete will be below the respective temperature limits for normal long-term operation.
Action:	If the temperature rise is greater than that specified, then the air inlets and exits should be checked for blockage. If the blockage is cleared and the temperature is still greater than that specified, the DSC and HSM cavity may be inspected using video equipment or other suitable means. If environmental factors can be ruled out as the cause of excessive temperatures, then the fuel bundles are producing heat at a rate higher than the upper limit specified in the Specification of Section 1.2.1 and will require additional measurements and analysis to assess the actual performance of the system. If excessive temperatures cause the system to perform in an unacceptable manner and/or the temperatures cannot be controlled to acceptable limits, then the cask shall be unloaded within the time period as determined by the analysis.
Surveillance:	The temperature rise shall be measured and recorded daily following DSC insertion until equilibrium temperature is reached, 24 hours after insertion, and again on a daily basis after insertion into the HSM or following the occurrence of accident conditions. If the temperature rise is within the specifications or the calculated value for a heat load less than 24 kW, then the HSM and DSC are performing as designed to meet this specification and no further maximum air exit temperature measurements are required. Air temperatures must be measured in such a manner as to obtain representative values of inlet and outlet air temperatures.
Basis:	The specified temperature rise is selected to ensure the fuel clad and concrete temperatures are maintained at or below acceptable long-term storage limits.

1.2.8a HSM-H Maximum Air Exit Temperature with a Loaded 24PTH DSC

	Following initial DSC transfer to the HSM-H or the occurrence of accident conditions, the equilibrium air temperature difference between ambient temperature and the vent outlet temperature shall not exceed 100°F when fully loaded with 40.8 kW heat for 24PTH-S or 24PTH-L DSC (or 70°F when fully loaded with 24PTH-S-LC DSC).
Applicability:	This specification is applicable to all HSM-H modules stored in the ISFSI. If a DSC is placed in the HSM-H with a heat load less than 40.8 kW, the limiting difference between outlet and ambient temperatures shall be determined by a calculation performed by the user using the same methodology and inputs documents in Appendix P of the FSAR.
Objective:	The objective of this limit is to ensure that the temperatures of the fuel cladding and the HSM-H concrete do not exceed the temperatures calculated in Appendix P of the FSAR. That section shows that if the air outlet temperature difference is less than or equal to 100°F with a thermal heat load of 40.8 kW for 24PTH-S or 24PTH-L DSC (or 70°F with a thermal heat load of 24.0 kW for 24PTH-S-LC), the fuel cladding and concrete will be below the respective temperature limits for normal long-term operation.
Action:	If the temperature rise is greater than that specified, then the air inlets and exits should be checked for blockage. If the blockage is cleared and the temperature is still greater than that specified, the DSC and HSM-H cavity may be inspected using video equipment or other suitable means. If environmental factors can be ruled out as the cause of excessive temperatures, then the fuel bundles are producing heat at a rate higher than the upper limit specified in the specification of Section 1.2.1 and will require additional measurements and analysis to assess the actual performance of the system. If excessive temperatures cause the system to perform in an unacceptable manner and/or the temperatures cannot be controlled to acceptable limits, then the cask shall be unloaded within the time period as determined by the analysis.
Surveillance:	The temperature rise shall be measured and recorded daily following DSC insertion until equilibrium temperature is reached, 24 hours after insertion, and again on a daily basis after insertion into the HSM-H or following the occurrence of accident conditions. If the temperature rise is within the specifications or the calculated value for a heat load less than 40.8 kW for 24PTH-S or 24PTH-L DSC (or 24.0 kW for 24PTH-S-LC DSC) then the HSM-H and DSC are performing as designed to meet this specification and no further maximum air exit temperature measurements are required. Air temperatures must be measured in such a manner as to obtain representative values of inlet and outlet air temperatures.
Basis:	The specified temperature rise is selected to ensure the fuel clad and concrete temperatures are maintained at or below acceptable long-term storage limits.

1.2.8b HSM-H Maximum Air Exit Temperature with a Loaded 61BTH DSC

	Following initial DSC transfer to the HSM-H or the occurrence of accident conditions, the equilibrium air temperature difference between ambient temperature and the vent outlet temperature shall not exceed 90°F when fully loaded with 31.2 kW heat load for a Type 2 61BTH DSC (or 70°F when fully loaded with 22.0 kW heat load for a Type 1 61BTH DSC).
Applicability:	This specification is applicable to all HSM-H modules stored in the ISFSI with a loaded 61BTH DSC. If a 61BTH DSC is placed in the HSM-H with a heat load less than 31.2 kW, the limiting difference between outlet and ambient temperatures shall be determined by a calculation performed by the user using the same methodology and inputs documents in Appendix T of the FSAR.
Objective:	The objective of this limit is to ensure that the temperatures of the fuel cladding and the HSM-H concrete do not exceed the temperatures calculated in Appendix T of the FSAR. That section shows that if the air outlet temperature difference is less than or equal to 90°F with a thermal heat load of 31.2 kW for a Type 2 61BTH DSC (or 70°F with a thermal heat load of 22.0 kW for a Type 1 61BTH DSC), the fuel cladding and concrete will be below the respective temperature limits for normal long-term operation.
Action:	If the temperature rise is greater than that specified, then the air inlets and exits should be checked for blockage. If the blockage is cleared and the temperature is still greater than that specified, the DSC and HSM-H cavity may be inspected using video equipment or other suitable means. If environmental factors can be ruled out as the cause of excessive temperatures, then the fuel bundles are producing heat at a rate higher than the upper limit specified in the specification of Section 1.2.1 and will require additional measurements and analysis to assess the actual performance of the system. If excessive temperatures cause the system to perform in an unacceptable manner and/or the temperatures cannot be controlled to acceptable limits, then the cask shall be unloaded within the time period as determined by the analysis.
Surveillance:	The temperature rise shall be measured and recorded daily following DSC insertion until equilibrium temperature is reached, 24 hours after insertion, and again on a daily basis after insertion into the HSM-H or following the occurrence of accident conditions. If the temperature rise is within the specifications or the calculated value for a heat load less than 31.2 kW for a Type 2 61BTH DSC (or 22.0 kW for a Type 1 61BTH DSC) then the HSM-H and DSC are performing as designed to meet this specification and no further maximum air exit temperature measurements are required. Air temperatures must be measured in such a manner as to obtain representative values of inlet and outlet air temperatures.

Basis:

The specified temperature rise is selected to ensure the fuel clad and concrete temperatures are maintained at or below acceptable long-term storage limits.

1.2.8c HSM-H Maximum Air Exit Temperature with a Loaded 32PTH1 DSC

	Following initial DSC transfer to the HSM-H or the occurrence of accident conditions, the equilibrium air temperature difference between ambient temperature and the vent outlet temperature shall not exceed 110°F when fully loaded with 40.8 kW heat load for a 32PTH1 DSC.
Applicability:	This specification is applicable to all HSM-H modules stored in the ISFSI with a loaded 32PTH1 DSC. If a 32PTH1 DSC is placed in the HSM-H with a heat load less than 40.8 kW, the limiting difference between outlet and ambient temperatures shall be determined by a calculation performed by the user using the same methodology and inputs documents in Appendix U of the FSAR.
Objective:	The objective of this limit is to ensure that the temperatures of the fuel cladding and the HSM-H concrete do not exceed the temperatures calculated in Appendix U of the FSAR. That section shows that if the air outlet temperature difference is less than or equal to 110°F with a thermal heat load of 40.8 kW for 32PTH1 DSC, the fuel cladding and concrete will be below the respective temperature limits for normal long-term operation.
Action:	If the temperature rise is greater than that specified, then the air inlets and exits should be checked for blockage. If the blockage is cleared and the temperature is still greater than that specified, the DSC and HSM-H cavity may be inspected using video equipment or other suitable means. If environmental factors can be ruled out as the cause of excessive temperatures, then the fuel bundles are producing heat at a rate higher than the upper limit specified in the specification of Section 1.2.1 and will require additional measurements and analysis to assess the actual performance of the system. If excessive temperatures cause the system to perform in an unacceptable manner and/or the temperatures cannot be controlled to acceptable limits, then the cask shall be unloaded within the time period as determined by the analysis.
Surveillance:	The temperature rise shall be measured and recorded daily following DSC insertion until equilibrium temperature is reached, 24 hours after insertion, and again on a daily basis after insertion into the HSM-H or following the occurrence of accident conditions. If the temperature rise is within the specifications or the calculated value for a heat load less than 40.8 kW for 32PTH1 DSC, then the HSM-H and DSC are performing as designed to meet this specification and no further maximum air exit temperature measurements are required. Air temperatures must be measured in such a manner as to obtain representative values of inlet and outlet air temperatures.
Basis:	The specified temperature rise is selected to ensure the fuel clad and concrete temperatures are maintained at or below acceptable long-term storage limits.

1.2.9 Transfer Cask Alignment with HSM or HSM-H

	The cask must be aligned with respect to the HSM or HSM-H that the longitudinal centerline of the DSC in the transfer cask is within $\pm 1/8$ inch of its true position when the cask is docked with the HSM front access opening.		
Applicability:	This specification is applicable during the insertion and retrieval of all DSCs.		
Objective:	To ensure smooth transfer of the DSC from the transfer cask to HSM or HSM-H and back.		
Action:	If the alignment tolerance is exceeded, the following actions should be taken:		
	a. Confirm that the transfer system is properly configured.		
	b. Check and repair the alignment equipment.		
	c. Confirm the locations of the alignment targets on the transfer cask and HSM or HSM-H.		
Surveillance:	Before initiating DSC insertion or retrieval, confirm the alignment. Observe the transfer system during DSC insertion or retrieval to ensure that motion or excessive vibration does not occur.		
Basis:	The basis for the true position alignment tolerance is the clearance between the DSC shell, the transfer cask cavity, the HSM or HSM-H access opening, and the DSC support rails inside the HSM or HSM-H.		

1.2.10 TC/DSC Handling Height Outside the Spent Fuel Pool Building

Limit/Specification:	1.	When handling a loaded TC/DSC at a height greater than 80 inches outside the spent fuel pool building, a special lifting device that has at least twice the normal stress design factor for handling heavy loads, or a single failure proof handling system shall be used.	
	2.	In the event of a drop of a loaded TC/DSC from a height greater than 15 inches: (a) fuel in the DSC shall be returned to the reactor spent fuel pool; (b) the DSC shall be removed from service and evaluated for further use; and (c) the TC shall be inspected for damage and evaluated for further use.	
Applicability:	The specification applies to handling the TC, loaded with the DSC, on route to, and at, the storage pad.		
Objective:	1.	To preclude a loaded TC/DSC drop from a height greater than 80 inches.	
	2.	To maintain spent fuel integrity, according to the spent fuel specification for storage, continued confinement integrity, and DSC functional capability, after a tip-over or drop of a loaded DSC from a height greater than 15 inches.	
Surveillance:	In the event of a loaded TC/DSC drop accident, the system will be returned to the reactor fuel handling building, where, after the fuel has been returned to the spent fuel pool, the DSC and TC will be inspected and evaluated for future use.		
Basis:	The NRC evaluation of the TC/DSC drop analysis concurred that drops up to 80 inches, of the DSC inside the TC, can be sustained without breaching the confinement boundary, preventing removal of spent fuel assemblies, or causing a criticality accident. This specification ensures that handling height limits will not be exceeded in transit to, or at the storage pad. Acceptable damage may occur to the TC, DSC, and the fuel stored in the DSC, for drops of height greater than 15 inches. The specification requiring inspection of the DSC and fuel following a drop of 15 inches or greater ensures that the spent fuel will continue to meet the requirements for storage, the DSC will continue to provide confinement, and the TC will continue to provide its design functions of DSC transfer and shielding.		
1.2.11 Transfer Cask Dose Rates with a Loaded 24P, 52B, 61BT, or 32PT DSC

Limit/Specification:	Dose rates from the transfer cask shall be limited to levels which are less than or equal to:	
	a. 200 mrem/hr at 3 feet with water in the DSC cavity.	
	b. 500 mrem/hr at 3 feet without water in the DSC cavity.	
Applicability:	This specification is applicable to the transfer cask containing a loaded 24P, 52B, 61BT, or 32PT DSC.	
Objective:	The dose rate is limited to this value to ensure that the DSC has not been inadvertently loaded with fuel not meeting the specifications in Section 1.2.1 and to maintain dose rates as-low-as-is-reasonably achievable during DSC transfer operations.	
Action:	If specified dose rates are exceeded, place temporary shielding around affected areas of transfer cask and review the plant records of the fuel assemblies which have been placed in DSC to ensure they conform to the fuel specifications of Section 1.2.1. Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.	
Surveillance:	The dose rates should be measured as soon as possible after the transfer cask is removed from the spent fuel pool.	
Basis:	The basis for this limit is the shielding analysis presented in Section 7.0, Appendix J, Appendix K and Appendix M of the FSAR.	

1.2.11a Transfer Cask Dose Rates with a Loaded 24PHB DSC

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Limit/Specification:	Dose rates from the transfer cask shall be limited to levels which are less than or equal to:	
	a. 1700 mrem/hr at 3 feet from the top of the Cask at the cover plate edge with water in the DSC cavity.	
	b. 500 mrem/hr at 3 feet radially from the Cask surface without water in the DSC cavity.	
Applicability:	This specification is applicable to the transfer cask containing a loaded 24PHB DSC.	
Objective:	The dose rate is limited to this value to ensure that the DSC has not been inadvertently loaded with fuel not meeting the specifications in Section 1.2.1 and to maintain dose rates as-low-as-is-reasonably achievable during DSC transfer operations.	
Action:	If specified dose rates are exceeded, place temporary shielding around affected areas of transfer cask and review the plant records of the fuel assemblies which have been placed in DSC to ensure they conform to the fuel specifications of Section 1.2.1. Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.	
Surveillance:	The dose rates should be measured as soon as possible after the transfer cask is removed from the spent fuel pool.	
Basis:	The basis for this limit is the shielding analysis presented in Appendix N of the FSAR.	

1.2.11b Transfer Cask Dose Rates with a Loaded 24PTH-S or 24PTH-L DSC

Limit/Specification:	Dose rates from the transfer cask shall be limited to levels which are less than or equal to:	
	a. 500 mrem/hr at 3 feet from the top of the Cask at the cover plate edge with water in the DSC cavity.	
	b. 600 mrem/hr at 3 feet radially from the Cask surface without water in the DSC cavity.	
Applicability:	This specification is applicable to the transfer cask containing a loaded 24PTH-S or 24PTH-L DSC.	
Objective:	The dose rate is limited to this value to ensure that the DSC has not been inadvertently loaded with fuel not meeting the specifications in Section 1.2.1 and to maintain dose rates as-low-as-is-reasonably achievable during DSC transfer operations.	
Action:	If specified dose rates are exceeded, place temporary shielding around affected areas of transfer cask and review the plant records of the fuel assemblies which have been placed in DSC to ensure they conform to the fuel specifications of Section 1.2.1. Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.	
Surveillance:	The dose rates should be measured as soon as possible after the transfer cask is removed from the spent fuel pool.	
Basis:	The basis for this limit is the shielding analysis presented in Appendix P of the FSAR.	

	1.2.11c Transfer Cask Dose Rates with a Loaded 24PTH-S-LC DSC		
Limit/Specificatio		Dose rates from the transfer cask shall be limited to levels which are les than or equal to:	
		a. 20 mrem/hr at 3 feet from the top of the Cask at the cover plate edge with water in the DSC cavity.	
		b. 250 mrem/hr at 3 feet radially from the Cask surface without water in the DSC cavity.	
	Applicability:	This specification is applicable to the transfer cask containing a loaded 24PTH-S-LC DSC.	
	Objective:	The dose rate is limited to this value to ensure that the DSC has not been inadvertently loaded with fuel not meeting the specifications in Section 1.2.1 and to maintain dose rates as-low-as-is-reasonably achievable during DSC transfer operations.	
	Action:	If specified dose rates are exceeded, place temporary shielding around affected areas of transfer cask and review the plant records of the fuel assemblies which have been placed in DSC to ensure they conform to the fuel specifications of Section 1.2.1. Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.	
	Surveillance:	The dose rates should be measured as soon as possible after the transfer cask is removed from the spent fuel pool.	
	Basis:	The basis for this limit is the shielding analysis presented in Appendix P of the FSAR.	

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1.2.11d Transfer Cask Dose Rates with a Loaded 61BTH DSC

Limit/Specification:	Dose rates from the transfer cask shall be limited to levels which are less than or equal to:
	a. 600 mrem/hr at 3 feet from the vertical centerline of the DSC inner top cover plate.
	b. 500 mrem/hr at 3 feet radially from the Cask surface without water in the DSC cavity.
Applicability:	This specification is applicable to the transfer cask containing a loaded 61BTH DSC.
Objective:	The dose rate is limited to this value to maintain dose rates as-low-as-is- reasonably achievable during DSC transfer operations.
Action:	If specified dose rates are exceeded, place temporary shielding around affected areas of transfer cask and review the plant records of the fuel assemblies which have been placed in DSC to ensure they conform to the fuel specifications of Section 1.2.1. Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.
Surveillance:	For dose rate limit specified in 1.2.11d(a), the dose rate should be measured after the cask is removed from the spent fuel pool, water drained from the DSC cavity, TC/DSC annulus full (within approximately 1 foot of top), top shield plug, DSC inner top cover plate and welding machine with temporary shielding, in place and included in axial shielding.
	For dose rate limit specified in 1.2.11.d(b), the dose rate should be measured before the cask is downended on the trailer to be transferred to the ISFSI.
Basis:	The basis for this limit is the shielding analysis presented in Appendix T of the FSAR.

1.2.11e Transfer Cask Dose Rates with a Loaded 32PTH1 DSC

Limit/Specification:	Dose rates from the transfer cask shall be limited to levels which are less than or equal to:	
	a. 400 mrem/hr at 3 feet from the vertical centerline of the DSC inner top cover plate.	
	b. 300 mrem/hr at 3 feet radially from the Cask surface without water in the DSC cavity.	
Applicability:	This specification is applicable to the transfer cask containing a loaded 32PTH1 DSC.	
Objective:	The dose rate is limited to this value to maintain dose rates as-low-as-is- reasonably achievable during DSC transfer operations.	
Action:	If specified dose rates are exceeded, place temporary shielding around affected areas of transfer cask and review the plant records of the fuel assemblies which have been placed in DSC to ensure they conform to the fuel specifications of Section 1.2.1. Submit a letter report to the NRC within 30 days summarizing the action taken and the results of the surveillance, investigation and findings. The report must be submitted using instructions in 10 CFR 72.4 with a copy sent to the administrator of the appropriate NRC regional office.	
Surveillance:	For dose rate limit specified in 1.2.11e(a), the dose rate should be measured after the cask is removed from the spent fuel pool, water drained from the DSC cavity, TC/DSC annulus full (within approximately 1 foot of top), top shield plug, DSC inner top cover plate and welding machine with temporary shielding, in place and included in axial shielding.	
	For dose rate limit specified in 1.2.11.e(b), the dose rate should be measured before the cask is downended on the trailer to be transferred to the ISFSI.	
Basis:	The basis for this limit is the shielding analysis presented in Appendix U of the FSAR.	

1.2.12 Maximum DSC Removable Surface Contamination

Limit/Specification:

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	2,200 dpm/100 cm ² for beta-gamma sources 220 dpm/100 cm ² for alpha sources.	
Applicability:	This specification is applicable to all DSCs.	
Objective:	To ensure that release of non-fixed contamination above accepted limits does not occur.	
	Action: If the required limits are not met:	
	a. Flush the DSC/transfer cask annulus with demineralized water and/or scrub it using long handled tools. Repeat surface contamination surveys of the DSC upper surface.	
	b. If contamination of the DSC cannot be reduced to an acceptable level by this means, direct surface cleaning techniques shall be used following removal of the fuel assemblies from the DSC and removal of the DSC from the transfer cask.	
	c. Check and replace the DSC/transfer cask annulus seal to ensure proper installation and repeat canister loading process.	
Surveillance:	Following placement of each loaded DSC/transfer cask into the cask decontamination area, fuel pool water above the top shield plug shall be removed and the top region of the DSC and cask shall be decontaminated. A contamination survey of the upper 1 foot of the DSC shall be taken.	
Basis:	This non-fixed contamination level is consistent with the requirements of 10 CFR 71.87(i)(1) and 49 CFR 173.443, which regulate the use of spent fuel shipping containers. Consequently, these contamination levels are considered acceptable for exposure to the general environment. This level will also ensure that contamination levels of the inner surfaces of the HSM and potential releases of radioactive material to the environment are minimized.	

1.2.13 TC/DSC Lifting Heights as a Function of Low Temperature and Location

Limit/Specification:	1.	No lifts or handling of the TC/DSC at any height are permissible at DSC basket temperatures below -20°F inside the spent fuel pool building.
	2.	The maximum lift height of the TC/DSC shall be 80 inches if the basket temperature is below 0°F but higher than -20°F inside the spent fuel pool building.
	3.	No lift height restriction is imposed on the TC/DSC if the basket temperature is higher than 0°F inside the spent fuel pool building.
	4.	When handling a loaded TC/DSC at a height greater than 80 inches outside the spent fuel pool building, a special lifting device that has at least twice the normal stress design factor for handling heavy loads, or a single failure proof handling system shall be used and the basket temperature may not be lower than 0°F.
Applicability:	The load	ese temperature and height limits apply to lifting and transfer of all ded TC/DSCs inside and outside the spent fuel pool building.
	The The buil	e requirements of 10 CFR Part 72 apply outside the spent fuel building. e requirements of 10 CFR Part 50 apply inside the spent fuel pool lding.
Objective:	The frac DS	e low temperature and height limits are imposed to ensure that brittle eture of the ferritic steels, used in the TC trunnions and shell and in the C basket, does not occur during transfer operations.
Action:	Con or r may	firm the basket temperature before transfer of the TC. If calculation neasurement of this value is unavailable, then the ambient temperature y conservatively be used.
Surveillance:	The TC	e ambient temperature shall be measured before transfer of the /DSC.
Bases:	The para that the ND 40° mat	e basis for the low temperature and height limits is ANSI N14.6-1986 agraph 4.2.6 which requires at least 40°F higher service temperature in nil ductility transition (NDT) temperature for the TC. In the case of standardized TC, the test temperature is -40°F; therefore, although the iT temperature is not determined, the material will have the required F margin if the ambient temperature is 0°F or higher. This assumes the terial service temperature is equal to the ambient temperature.
	The The stru	e basis for the low temperature limit for the DSC is NUREG/CR-1815. basis for the handling height limits is the NRC evaluation of the actural integrity of the DSC to drop heights of 80 inches and less.

1.2.14 TC/DSC Transfer Operations at High Ambient Temperatures (24P, 52B, 61BT, 32PT, 24PHB, 24PTH, or 61BTH DSC only)

The ambient temperature for transfer operations of a loaded TC/DSC Limit/Specification: 1. (24P, 52B, 61BT, 32PT, 24PHB, 24PTH, or 61BTH DSC) shall not be greater that 100°F (when cask is exposed to direct insolation). For transfer operations when ambient temperatures exceed 100°F, a 2. solar shield shall be used to provide protection against direct solar radiation. This ambient temperature limit applies to all transfer operations of loaded Applicability: TC/DSCs outside the spent fuel pool building. The high temperature limit (100°F) is imposed to ensure that: **Objective:** The fuel cladding temperature limit is not exceeded, 1. The solid neutron shield material temperature limit is not exceeded, 2. and The corresponding TC cavity pressure limit is not exceeded. 3. Confirm what the ambient temperature is and provide appropriate solar Action: shade if ambient temperature is expected to exceed 100°F. The ambient temperature shall be measured before transfer of the Surveillance: TC/DSC. For the NUHOMS[®]-24P, 52B and 61BT systems, the basis for the high Bases: temperature limit is PNL-6189 (Reference 1) for the fuel clad limit, the manufacturer's specification for neutron shield, and the design basis pressure of the TC internal cavity pressure. For the NUHOMS[®]-32PT, 24PHB and 24PTH systems, the fuel cladding limits are based on ISG-11, Revision 2 (Reference 3). For the NUHOMS[®]-61BTH system and the NUHOMS[®]-61BT system with FANP 9x9-2 fuel assemblies, the fuel cladding limits are based on ISG-11 Revision 3 (Reference 4).

1.2.14a TC/DSC Transfer at High Ambient Temperatures (32PTH1 DSC Only)

Limit/Specification:	1. The ambient temperature for transfer operations of a loaded TC/DSC (32PTH1 DSC Only) shall not be greater that 106°F (when cask is exposed to direct insolation).	
	2. For transfer operations when ambient temperatures exceed 106°F, a solar shield shall be used to provide protection against direct solar radiation.	
Applicability:	This ambient temperature limit applies to all transfer operations of a loaded TC/DSC (32PTH1 DSC Only) outside the spent fuel pool building.	
Objective:	The high temperature limit (106°F) is imposed to ensure that:	
	1. The fuel cladding temperature limit is not exceeded,	
	2. The solid neutron shield material temperature limit is not exceeded, and	
	3. The corresponding TC cavity pressure limit is not exceeded.	
Action:	Confirm what the ambient temperature is and provide appropriate solar shade if ambient temperature is expected to exceed 106°F.	
Surveillance:	The ambient temperature shall be measured before transfer of the TC/DSC.	
Bases:	For the NUHOMS [®] -32PTH1 system, the fuel cladding limits are based on ISG-11 Revision 3 (Reference 4).	

1.2.15 Boron Concentration in the DSC Cavity Water for the 24-P Design Only

Limit/Specification:

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	The DSC cavity shall be filled only with water having a boron concentration equal to, or greater than:	
	1) 2,000 ppm for fuel with an equivalent unirradiated enrichment of less than or equal to 1.45 wt. % U-235 per Figure 1-1.	
	 2,350 ppm for fuel with an equivalent unirradiated enrichment of greater than 1.45 wt. % U-235 per Figure 1-1. 	
Applicability:	This limit applies only to the standardized NUHOMS [®] -24P design. No boration in the cavity water is required for the standardized NUHOMS [®] -52B or NUHOMS [®] -61BT system since that system uses fixed absorber plates.	
Objective:	1) To ensure a subcritical configuration is maintained in the case of accidental loading of the DSC with unirradiated fuel.	
	2) To ensure a subcritical configuration is maintained in the case of loading of the DSC with fuel with an equivalent unirradiated enrichment of greater than 1.45 wt. % U-235.	
Action:	If the boron concentration is below the required weight percentage concentration (gm boron/ 10^6 gm water), add boron and re-sample, and test the concentration until the boron concentration is shown to be greater than that required.	
Surveillance:	Written procedures shall be used to independently determine (two samples analyzed by different individuals) the boron concentration in the water used to fill the DSC cavity.	
	1. Within 4 hours before insertion of the first fuel assembly into the DSC, the dissolved boron concentration in water in the spent fuel pool, and in the water that will be introduced in the DSC cavity, shall be independently determined (two samples chemically analyzed by two individuals).	
	2. Within 4 hours before flooding the DSC cavity for unloading the fuel assemblies, the dissolved boron concentration in water in the spent pool, and in the water that will be introduced into the DSC cavity, shall be independently determined (two samples analyzed chemically by two individuals).	

- 3. The dissolved 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 or the fuel has been removed from the DSC.
- Bases: 1) The required boron concentration is based on the criticality analysis for an accidental misloading of the DSC with unburned fuel, maximum enrichment, and optimum moderation conditions.
 - 2) The required boron concentration is based on the criticality analysis for loading of the DSC with unirradiated fuel, maximum enrichment, and optimum moderation conditions.

1.2.15a Boron Concentration in the DSC Cavity Water for the 32PT Design Only

Limit/Specification:		
Linit Speenearion	The DSC cavity shall be filled only with water having a minimum boron concentration per Table 1-1g.	
Applicability:	This limit applies only to the standardized NUHOMS [®] - 32PT design.	
Objective:	To ensure a subcritical configuration is maintained in the case of loading of the DSC with design basis fuel.	
Action:	If the boron concentration is below the required weight percentage concentration (gm boron/ 10^6 gm water), add boron and re-sample, and test the concentration until the boron concentration is shown to be greater than that required.	
Surveillance:	Written procedures shall be used to independently determine (two samples analyzed by different individuals) the boron concentration in the water used to fill the DSC cavity.	
	1. Within 4 hours before insertion of the first fuel assembly into the DSC, the dissolved boron concentration in water in the spent fuel pool, and in the water that will be introduced in the DSC cavity, shall be independently determined (two samples chemically analyzed by two individuals).	
	2. Within 4 hours before flooding the DSC cavity for unloading the fuel assemblies, the dissolved boron concentration in water in the spent pool, and in the water that will be introduced into the DSC cavity, shall be independently determined (two samples analyzed chemically by two individuals).	
	3. The dissolved 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 or the fuel has been removed from the DSC.	
Bases:	The required boron concentration is based on the criticality analysis presented in Appendix M of this FSAR for loading of the DSC with unirradiated fuel, maximum enrichment, and optimum moderation conditions.	

1.2.15b Boron Concentration in the DSC Cavity Water for the 24PHB Design Only

Limit/Specification:

- The DSC cavity shall be filled only with water having a boron concentration equal to, or greater than 2,350 ppm for enrichment of less than or equal to 4.0 wt. % U-235 based on the spent fuel assembly with the maximum initial enrichment in the DSC.
- The DSC cavity shall be filled only with water having a minimum boron concentration per Figure 1-10 for initial enrichment of greater than or equal to 4.0 wt. % U-235 based on the spent fuel assembly with the maximum initial enrichment in the DSC.
- Applicability: This limit applies only to the standardized NUHOMS[®]-24PHB design.

Objective: To ensure a subcritical configuration is maintained in the case of accidental loading of the DSC with unirradiated fuel.

Action: If the boron concentration is below the required weight percentage concentration (gm boron/ 10^6 gm water), add boron and re-sample, and test the concentration until the boron concentration is shown to be greater than that required.

- Surveillance: Written procedures shall be used to independently determine (two samples analyzed by different individuals) the boron concentration in the water used to fill the DSC cavity.
 - 1. Within 4 hours before insertion of the first fuel assembly into the DSC, the dissolved boron concentration in water in the spent fuel pool, and in the water that will be introduced in the DSC cavity, shall be independently determined (two samples chemically analyzed by two individuals).
 - 2. Within 4 hours before flooding the DSC cavity for unloading the fuel assemblies, the dissolved boron concentration in water in the spent pool, and in the water that will be introduced into the DSC cavity, shall be independently determined (two samples analyzed chemically by two individuals).
 - 3. The dissolved 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 or the fuel has been removed from the DSC.
- Bases: The required boron concentration is based on the criticality analysis for loading of the DSC with unirradiated fuel, initial enrichment, and optimum moderation conditions.

1.2.15c Boron Concentration in the DSC Cavity Water for the 24PTH Design Only

Limit/Specification:

- The DSC cavity shall only be filled with water having a minimum boron concentration which meets the requirements of Table 1-1p, when loading intact fuel. Table 1-1p lists the minimum soluble boron concentration as a function of the fuel assembly class, DSC basket type and the corresponding assembly average initial enrichment values.
- The DSC cavity shall only be filled with water having a minimum boron concentration which meets the requirements of Table 1-1q, when loading damaged fuel. Table 1-1q lists the minimum soluble boron concentration as a function of the fuel assembly class, DSC basket type, the maximum number of damaged fuel assemblies allowed and the corresponding maximum assembly average initial enrichment values.
- Applicability: This limit applies only to the NUHOMS[®]-24PTH design.
- Objective: To ensure a subcritical configuration is maintained in the case of accidental loading of the DSC with unirradiated fuel.
- Action: If the boron concentration is below the required weight percentage concentration (gm boron/ 10^6 gm water), add boron and re-sample, and test the concentration until the boron concentration is shown to be greater than that required.
- Surveillance: Written procedures shall be used to independently determine (two samples analyzed by different individuals) the boron concentration in the water used to fill the DSC cavity.
 - 1. Within 4 hours before insertion of the first fuel assembly into the DSC, the dissolved boron concentration in water in the spent fuel pool, and in the water that will be introduced in the DSC cavity, shall be independently determined (two samples chemically analyzed by two individuals).
 - 2. Within 4 hours before flooding the DSC cavity for unloading the fuel assemblies, the dissolved boron concentration in water in the spent pool, and in the water that will be introduced into the DSC cavity, shall be independently determined (two samples analyzed chemically by two individuals).
 - 3. The dissolved 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 or the fuel has been removed from the DSC.
- Bases: The required boron concentration is based on the criticality analysis in FSAR Appendix P for loading of the DSC with unirradiated fuel, initial enrichment, and optimum moderation conditions.

1.2.15d Boron Concentration in the DSC Cavity Water for the 32PTH1 Design Only Limit/Specification:

- The DSC cavity shall only be filled with water having a minimum boron concentration which meets the requirements of Table 1-1cc, when loading intact fuel. Table 1-1cc lists the minimum soluble boron concentration as a function of the fuel assembly class, DSC basket type and the corresponding assembly average initial enrichment values.
 The DSC cavity shall only be filled with water having a minimum boron
 - The DSC cavity shall only be filled with water having a minimum boron concentration which meets the requirements of Table 1-1dd, when loading damaged fuel. Table 1-1dd lists the minimum soluble boron concentration as a function of the fuel assembly class, DSC basket type, the maximum number of damaged fuel assemblies allowed and the corresponding maximum assembly average initial enrichment values.

Applicability: This limit applies only to the NUHOMS[®]-32PTH1 design.

Objective: To ensure a subcritical configuration is maintained in the case of accidental loading of the DSC with unirradiated fuel.

Action: If the boron concentration is below the required weight percentage concentration (gm boron/ 10^6 gm water), add boron and re-sample, and test the concentration until the boron concentration is shown to be greater than that required.

Surveillance: Written procedures shall be used to independently determine (two samples analyzed by different individuals) the boron concentration in the water used to fill the DSC cavity.

1. Within 4 hours before insertion of the first fuel assembly into the DSC, the dissolved boron concentration in water in the spent fuel pool, and in the water that will be introduced in the DSC cavity, shall be independently determined (two samples chemically analyzed by two individuals).

- 2. Within 4 hours before flooding the DSC cavity for unloading the fuel assemblies, the dissolved boron concentration in water in the spent pool, and in the water that will be introduced into the DSC cavity, shall be independently determined (two samples analyzed chemically by two individuals).
- 3. The dissolved 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 or the fuel has been removed from the DSC.
- Bases: The required boron concentration is based on the criticality analysis in FSAR Appendix U for loading of the DSC with unirradiated fuel, initial enrichment, and optimum moderation conditions.

1.2.16 Provision of TC Seismic Restraint Inside the Spent Fuel Pool Building as a Function of Horizontal Acceleration and Loaded Cask Weight

Limit/Specification:

	Seismic restraints shall be provided to prevent overturning of a loaded TC during a seismic event if a certificate holder determines that the horizontal acceleration is 0.40 g or greater. The determination of horizontal acceleration acting at the center of gravity (CG) of the loaded TC must be based on a peak horizontal ground acceleration at the site, but shall not exceed <i>that given in Technical Specification 1.1.1(3)</i> .
Applicability:	This condition applies to all TCs which are subject to horizontal accelerations of 0.40 g or greater.
Objective:	To prevent overturning of a loaded TC inside the spent fuel pool building.
Action:	Determine what the horizontal acceleration is for the TC.
Surveillance:	Determine need for TC restraint before any operations inside the spent fuel pool building.
Bases:	Calculation of overturning and restoring moments.

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1.2.17 61BT DSC Vacuum Drying Duration Limit

Limit/Specifications:

	Time limit for duration of Vacuum Drying is 96 hours after completion of 61BT DSC draining.			
Applicability:	This specification is only applicable to a 61BT DSC with greater than 17.6 kW heat load.			
Objective:	To ensure that 61BT DSC basket structure does not exceed 800°F.			
Action:	1. If the DSC vacuum drying pressure limit of Technical Specification 1.2.2 cannot be achieved at 72 hours after completion of DSC draining, the DSC must be backfilled with 0.1 atm or greater helium pressure within 24 hours.			
	2. Determine the cause of failure to achieve the vacuum drying pressure limit as defined in Technical Specification 1.2.2.			
	3. Initiate vacuum drying after actions in Step 2 are completed or unload the DSC within 30 days.			
Surveillance:	No maintenance or tests are required during the normal storage. Monitoring of the time duration during the vacuum drying operation is required.			
Bases:	The time limit of 96 hours was selected to ensure that the temperature within the DSC is within the design limits during vacuum drying.			

1.2.17a 32PT DSC Vacuum Drying Duration Limit

Limit/Specifications:

	1. The limit for duration of Vacuum Drying is 31 hrs for a 32PT DSC with a heat load greater than 8.4 kW and up to 24 kW after initiation of vacuum drying.			
	2. The limit for duration of Vacuum Drying is 36 hrs for a 32PT DSC with a heat load of up to 8.4 kW after initiation of vacuum drying.			
Applicability:	This specification is applicable to a 32PT DSC with heat load as described above.			
Objective:	To ensure the fuel cladding temperature in the 32PT DSC does not exceed 752°F during drying and also to meet the thermal cycling limit of 117°F during drying, helium backfilling and transfer operations.			
Action:	1. If the DSC vacuum drying pressure limit of Technical Specification 1.2.2 cannot be achieved at the specified time limits after initiation of vacuum drying, the DSC must be backfilled with 0.1 atm or greater helium pressure within 2 hours.			
	2. Determine the cause of failure to achieve the vacuum drying pressure limit as defined in Technical Specification 1.2.2.			
	3. Initiate vacuum drying after actions in Step 2 are completed or unload the DSC within 30 days.			
Surveillance:	No maintenance or tests are required during the normal storage. Monitoring of the time duration during the vacuum drying operation is required.			
Bases:	The time limits for the 32PT DSC were selected to ensure that the maximum cladding temperature is within the acceptable limit of 752°F during vacuum drying. These time limits also ensure that the cladding temperature meets the thermal cycling criteria of 117°F during drying, helium backfilling and transfer operations.			

1.2.17b 24PHB DSC Vacuum Drying Duration Limit

Limit/Specifications:

	1. The limit for duration of Vacuum Drying is 29 hrs for a 24PHB DSC with a heat load greater than 12.0 kW and up to 24 kW after initiation of vacuum drying.			
	2. The limit for duration of Vacuum Drying is 32 hrs for a 24PHB DSC with a heat load of up to 12.0 kW after initiation of vacuum <i>drying</i> .			
Applicability:	This specification is applicable to a 24PHB DSC with heat load as described above.			
Objective:	To ensure the fuel cladding temperature in the 24PHB DSC does not exceed 752°F during drying and also to meet the thermal cycling limit of 117°F during drying, helium backfilling and transfer operations.			
Action:	1. If the DSC vacuum drying pressure limit of Technical Specification 1.2.2 cannot be achieved at the specified time limits after initiation of vacuum drying, the DSC must be backfilled with 0.1 atm or greater helium pressure within 2 hours.			
	2. Determine the cause of failure to achieve the vacuum drying pressure limit as defined in Technical Specification 1.2.2.			
	3. Initiate vacuum drying after actions in Step 2 are completed or unload the DSC within 30 days.			
Surveillance:	No maintenance or tests are required during the normal storage. Monitoring of the time duration during the vacuum drying operation is required.			
Bases:	The time limit for the 24PHB DSC were selected to ensure that the maximum cladding temperature is within the acceptable limits of 752°F during vacuum drying. These time limits also ensure that the cladding temperature meets the thermal cycling criteria of 117°F during drying, helium backfilling and transfer operations.			

1.2.17c 24PTH DSC Vacuum Drying Duration Limit

Limit/Specifications:

	1. If nitrogen is used for blowdown, the time duration of vacuum drying for a 24PTH DSC following blowdown completion shall be less than or equal to:		
	 17 hours for Heat Load Configuration No. 1, 2 and 3 23 hours for Heat Load Configuration No. 4 26 hours for Heat Load Configuration No. 5 		
	2. No time limits apply for vacuum drying of 24PTH DSC if helium is used for blowdown.		
Applicability:	This specification is applicable to a 24PTH DSC with heat load configuration following blowdown using helium or nitrogen as described above.		
Objective:	To ensure the fuel cladding temperature in the 24PTH DSC does not exceed 752°F during drying and also to meet the thermal cycling limit of 117°F during drying, helium backfilling and transfer operations.		
Action:	1. If the DSC vacuum drying pressure limit of Technical Specification 1.2.2 cannot be achieved at the specified time limits after initiation of vacuum drying, the DSC must be backfilled with 0.1 atm or greater helium pressure within 2 hours.		
	2. Determine the cause of failure to achieve the vacuum drying pressure limit as defined in Technical Specification 1.2.2.		
	3. Initiate vacuum drying after actions in Step 2 are completed or unload the DSC within 30 days.		
Surveillance:	No maintenance or tests are required during the normal storage. Monitoring of the time duration during the vacuum drying operation is required.		
Bases:	The time limit for the 24PTH DSC were selected to ensure that the maximum cladding temperature is within the acceptable limits of 752°F during vacuum drying. These time limits also ensure that the cladding temperature meets the thermal cycling criteria of 117°F during drying, helium backfilling and transfer operations.		

1.2.18 Time Limit for Completion of 24PTH DSC Transfer Operation

Limit Specification:

	The time limit for completion of transfer of a loaded and welded 24PTH DSC from the cask handling area to the HSM-H is as follows:
	• 9.5 hours for a DSC with Heat Load Zoning Configuration 1, 2 or 3 and with basket types 1A, 1B or 1C.
	• 25 hours for a DSC with a basket type 2A, 2B or 2C (without aluminum inserts).
	 No time limits apply for a DSC with Heat Load Zoning Configuration 4 with a basket type 1A, 1B, or 1C (with aluminum inserts).
Applicability:	This specification is only applicable to a 24PTH-S or 24PTH-L DSC when transferred in OS197FC cask. The time limit is defined as the time elapsed after the initiation of draining of Cask/DSC annulus water and bolting of the transfer cask top cover plate until it is unbolted for insertion of the DSC into the HSM-H.
Objective:	To ensure that the fuel cladding temperatures in the 24PTH DSC do not exceed 752°F during transfer operations.
Actions:	Initiate one of the following corrective actions within two hours if specified time limits are exceeded.
	 Complete the transfer of the DSC from the transfer cask to the HSM- H, or
	2. If the transfer cask is in the cask handling area in a vertical orientation, unbolt the cask top cover plate and fill the cask/DSC annulus with clean water, or
	3. If the cask is in a horizontal orientation on the transfer skid, then initiate air circulation in the Cask/DSC annulus by starting one of the blowers provided on the cask transfer skid, or
	4. Initiate appropriate external cooling of the cask outer surface by other means to limit the temperature increase or return the cask to the cask handling area, unbolt the cask top cover plate and fill the cask/DSC annulus with clean water.
Surveillance:	Monitoring of the time duration following the completion of the DSC sealing until the completion of unbolting of the transfer cask top plate is required.
Bases:	The required time limit is based on the transient thermal analysis presented in Appendix P of the FSAR for the transfer of the 24PTH DSC.

1.2.18a Time Limit for Completion of Type 2 61BTH DSC Transfer Operation

Limit Specification:

	The time limit for completion of transfer of a loaded and welded Type 2 61BTH DSC from the cask handling area to the HSM-H is as follows:		
	• 13 hours with a Heat Load Zoning Configuration No. 7.		
	• 26 hours with Heat Load Zoning Configuration 5, 6, or 8.		
	• No time limits apply with Heat Load Zoning Configuration No. 1, 2, 3, or 4.		
Applicability:	This specification is only applicable to a Type 2 61BTH DSC when transferred in OS197FC-B Cask. The time limit is defined as the time elapsed after the initiation of draining of Cask/DSC annulus water and bolting of the transfer cask top cover plate until it is unbolted for insertion of the DSC into the HSM-H.		
Objective:	To ensure that the fuel cladding temperatures in the 61BTH DSC do not exceed 752°F during transfer operations.		
Actions:	Initiate one of the following corrective actions within two hours if specified time limits are exceeded.		
	1. Complete the transfer of the DSC from the transfer cask to the HSM- H, or		
	2. If the transfer cask is in the cask handling area in a vertical orientation, unbolt the cask top cover plate and fill the cask/DSC annulus with clean water, or		
	5. If the cask is in a horizontal orientation on the transfer skid, then initiate air circulation in the Cask/DSC annulus by starting one of the blowers provided on the cask transfer skid, or		
	6. Initiate appropriate external cooling of the cask outer surface by other means to limit the temperature increase or return the cask to the cask handling area, unbolt the cask top cover plate and fill the cask/DSC annulus with clean water.		
Surveillance:	Monitoring of the time duration following the completion of the DSC sealing until the completion of unbolting of the transfer cask top plate is required.		
Bases:	The required time limit is based on the transient thermal analysis presented in Appendix T of the FSAR for the transfer of the 61BTH DSC.		

1.2.18b Time Limit for Completion of 32PTH1 DSC Transfer Operation

Limit Specification:

The time limit for completion of transfer of a loaded and welded 32PTH1 DSC from the cask handling area to the HSM-H is as follows:

- 13 hours if the DSC is loaded with fuel assemblies arranged in Heat Load Zoning Configuration No. 1.
- No time limit if the DSC with Type 1 Basket is loaded with intact fuel assemblies or 38 hours if it is loaded with damaged fuel assemblies arranged in Heat Load Zoning Configuration No. 2.
- 14 hours if the DSC with Type 2 Basket is loaded with intact fuel assemblies or 10 hours if it is loaded with damaged fuel assemblies arranged in Heat Land Zoning Configuration No. 2.
- No time limits apply with Heat Load Zoning Configuration No. 3.
- Applicability: This specification is only applicable to a 32PTH1 DSC when transferred in a OS200FC Cask. The time limit is defined as the time elapsed after the initiation of draining of Cask/DSC annulus water and bolting of the transfer cask top cover plate until it is unbolted for insertion of the DSC into the HSM-H.
- *Objective:* To ensure that the fuel cladding temperatures in the 32PTH1 DSC do not exceed 752°F during transfer operations.

Actions: Initiate one of the following corrective actions within two hours if specified time limits are exceeded.

- 1. Complete the transfer of the DSC from the transfer cask to the HSM-H, or
- 2. If the transfer cask is in the cask handling area in a vertical orientation, unbolt the cask top cover plate and fill the Cask/DSC annulus with clean water, or
- 3. If the cask is in a horizontal orientation on the transfer skid, then initiate air circulation in the Cask/DSC annulus by starting one of the blowers provided on the cask transfer skid, or
- 4. Initiate appropriate external cooling of the cask outer surface by other means to limit the temperature increase or return the cask to the cask handling area, unbolt the cask top cover plate and fill the cask/DSC annulus with clean water.

Surveillance: Monitoring of the time duration following the completion of the DSC sealing until the completion of unbolting of the transfer cask top plate is required.

Bases: The required time limit is based on the transient thermal analysis presented in Appendix U of the FSAR for the transfer of the 32PTH1 DSC.

1.3 Surveillance and Monitoring

One of the two alternate surveillance activities listed below (1.3.1 or 1.3.2) shall be performed for monitoring the HSM or HSM-H thermal performance.

1.3.1 Visual Inspection of HSM or HSM-H Air Inlets and Outlets (Front Wall and Roof Birdscreen)

Limit/Surveillance:

A visual surveillance of the exterior of the air inlets and outlets shall be
conducted daily. In addition, a close-up inspection shall be performed to
ensure that no materials accumulate between the modules to block the air
flow.

- Objective: To ensure that HSM or HSM-H air inlets and outlets are not blocked for more than *analyzed time period* to prevent exceeding the allowable HSM or HSM-H concrete and or the fuel cladding temperatures.
- Applicability:This specification is applicable to all HSMs or HSM-Hs loaded with a
DSC loaded with spent fuel.
- Action: If the surveillance shows blockage of air vents (inlets or outlets), they shall be cleared. If the screen is damaged, it shall be replaced.

Basis: The concrete temperature could exceed 350°F in the accident circumstances of complete blockage of all vents. Concrete temperatures over 350°F in accidents (without the presence of water or steam) can have uncertain impact on concrete strength and durability. A conservative analysis (adiabatic heat case) of complete blockage of all air inlets or outlets indicates that the concrete can reach the accident temperature limit of 350°F in the time periods specified for HSM. For HSM-H, the time period specified ensures that blockage will not exist for periods longer than that assumed in the Safety analysis presented in Appendix P, *Appendix T and Appendix U* of the FSAR. At the *analyzed time* limit, the fuel cladding temperature remains well below the accident limit of 1058°F.

1.3.2 HSM or HSM-H Thermal Performance

Surveillance:	Verify a temperature measurement of the thermal performance, for each HSM or HSM-H, on a daily basis. The temperature measurement could be any parameter such as (1) a direct measurement of the HSM or HSM-H temperatures, (2) a direct measurement of the DSC temperatures, (3) a comparison of the inlet and outlet temperature difference to predicted temperature differences for each individual HSM or HSM-H, or (4) other means that would identify and allow for the correction of off-normal thermal conditions that could lead to exceeding the concrete and fuel clad temperature criteria. If air temperatures are measured, they must be measured in such a manner as to obtain representative values of inlet and outlet air temperatures. Also due to the proximity of adjacent HSM or HSM-H modules, care must be exercised to ensure that measured air temperatures reflect only the thermal performance of an individual module, and not the combined performance of adjacent modules.
Action:	If the temperature measurement shows a significant unexplained difference, so as to indicate the approach of materials to the concrete or fuel clad temperature criteria, take appropriate action to determine the cause and return the canister to normal operation. If the measurement or other evidence suggests that the concrete accident temperature criteria (350°F) has been exceeded for more than 24 hours, the HSM or HSM-H must be removed from service unless the licensee can provide test results in accordance with ACI-349, appendix A.4.3, demonstrating that the structural strength of the HSM or HSM-H has an adequate margin of safety.
Basis:	The temperature measurement should be of sufficient scope to provide the licensee with a positive means to identify conditions which threaten to approach temperature criteria for proper HSM or HSM-H operation and allow for the correction of off-normal thermal conditions that could lend to exceeding the concrete and fuel clad temperature criteria.

Surv	eillance or Monitoring	Period	Reference Section
1.	Fuel Specification	PL	1.2.1
2.	DSC Vacuum Pressure During Drying	L	1.2.2
3.	DSC Helium Backfill Pressure	L	1.2.3 or 1.2.3a
4.	DSC Helium Leak Rate of Inner Seal Weld	L	1.2.4 or 1.2.4a
5.	DSC Dye Penetrant Test of Closure Welds	L	1.2.5
6.	DELETED	-	-
7.	HSM or HSM-H Dose Rates	L	1.2.7 or 1.2.7a, or 1.2.7b or 1.2.7c or 1.2.7d or 1.2.7e or 1.2.7f or 1.2.7g
8.	HSM or HSM-H Maximum Air Exit Temperature	24 hrs	1.2.8 or 1.2.8a or 1.2.8b or 1.2.8c
9.	TC Alignment with HSM or HSM-H	S	1.2.9
10.	DSC Handling Height Outside Spent Fuel Pool Building	AN	1.2.10
11.	Transfer Cask Dose Rates	L	1.2.11 or 1.2.11a or 1.2.11b or 1.2.11c or 1.2.11d or 1.2.11e
12.	Maximum DSC Removable Surface Contamination	L	1.2.12
13.	TC/DSC Lifting Heights as a Function of Low Temperature and Location	L	1.2.13
14.	TC/DSC Transfer Operations at High Ambient Temperatures	L	1.2.14 or 1.2.14a
15.	Boron Concentration in DSC Cavity Water	PL	1.2.15, or 1.2.15a, or 1.2.15b or 1.2.15c <i>or</i> <i>1.2.15d</i>
16.	Provision of TC Seismic Restraint Inside the Spent Fuel Pool Building as a Function of Horizontal Acceleration and Loaded Cask Weight	PL	1.2.16
17.	Vacuum Drying Duration Limits	L	1.2.17 or 1.2.17a, or 1.2.17b, or 1.2.17c
18.	24PTH DSC Transfer Time	L	1.2.18
19.	Type 2 61BTH DSC Transfer Time	L	1.2.18a
20.	32PTH1 DSC Transfer Time	L	1.2.18b
21.	Visual Inspection of HSM or HSM-H Air Inlets and Outlets OR HSM OR HSM-H Thermal Performance	D	1.3.1 or 1.3.2

Table 1.3.1Summary of Surveillance and Monitoring Requirements

LEGEND

PL..... Prior to Loading

L..... During loading and prior to movement to HSM or HSM-H pad

24 hrs...... Time following DSC insertion to HSM or HSM-H

S Prior to movement of DSC to or from HSM or HSM-H

AN..... As necessary

D..... Daily (24 hour frequency)

References

- Levy, I.S., et al., "Recommended Temperature Limits for Dry Storage of Spent Light Water Reactor Zircaloy-Clad Fuel Rods in Inert Gas," Pacific Northwest Laboratory Report, <u>PNL-6189</u>, May 1987.
- 2. Johnson, A.B., Jr., and E.R. Gilbert, "Technical Basis for Storage of Zircaloy-Clad Spent Fuel in Inert Gases," <u>PNL-4835</u>, September 1983.
- 3. Interim Staff Guidance No. 11, Revision 2, "Cladding Considerations for the Transportation and Storage of Spent Fuel," July 30, 2002.
- 4. Interim Staff Guidance No. 11, Revision 3, "Cladding Considerations for the Transportation and Storage of Spent Fuel," November 17, 2003.

The NUHOMS[®]-24PTH system adds a new canister with three alternate configurations (designated as DSC Type 24PTH-S, -24PTH-L, or -24PTH-S-LC), a new module designated as HSM-H, and a modified version of OS197/OS197H transfer cask designated as OS197FC/OS197H FC.

A detailed description of the 24PTH system, including drawings, authorized payload contents and supporting safety analyses for this system are provided in Appendix P of this UFSAR.

Amendment 8 to CoC also authorized storage of low enrichment and reconstituted fuel in the 32PT DSC. In addition, the authorized contents of the 24PHB DSC were revised to include additional fuel types. A detailed description of the changes implemented to the 32PT and 24PHB DSCs are provided in Appendices M and N, respectively.

TN has added an alternate HSM, designated as HSM Model 152, to the standardized NUHOMS[®] system. This alternate HSM design provides enhanced shielding features while meeting the heat rejection requirements. A detailed description of the HSM Model 152 and supporting analyses are provided in Appendix R.

Amendment No. 9 to CoC 1004 adds FANP9 fuel to the contents of the 61BT DSC.

Amendment No. 10 to CoC 1004 adds 61BTH system to the Standardized NUHOMS[®] system. The NUHOMS[®] 61BTH DSC is designed to store a total of 61 intact (or up to 16 damaged and balance intact) BWR fuel assemblies with a maximum assembly average initial enrichment of 5.0 wt. % U-235, a maximum assembly average burnup of 62 GWd/MTU, and a minimum cooling time of 3.0 years. Eight heat load zoning configurations are authorized and the system is designed to accommodate a decay heat load of up to 31.2 kW per DSC depending upon the specific configuration selected. A detailed description of the 61BTH system, including drawings, authorized payload contents and supporting safety analyses are provided in Appendix T of this UFSAR.

Amendment No. 10 to CoC 1004 also adds the NUHOMS[®] 32PTH1 system to the standardized NUHOMS[®] system. The NUHOMS[®] 3PTH1 DSC is designed to store a total of 32 intact or up to 16 damaged and balance intact) PWR fuel assemblies with a maximum assembly average initial enrichment of 5.0 wt. % U-235, a maximum assembly average burnup of 62 GWd/MTU, and a minimum cooling time of 3.0 years. Three heat load zoning configurations are authorized and the system is designed to accommodate a decay heat load of up to 40.8 kW per DSC depending upon the specific configuration selected. A detailed description of the 32PTH1 DSC, including drawings, authorized payload contents and supporting safety analyses are provided in Appendix U of this UFSAR.

Amendment No. 10 to CoC also expands the storage of Control Components in the 32PT DSC and storage of WE 15x15 Partial Length Shield Assemblies in the 24PTH DSC. Details of the changes implemented to the 32PT and 24PTH DSCs are provided in Appendices M and P, respectively.

Chapters 1 though 8 and Appendices A through H of this FSAR provide the supporting licensing basis for the Standardized NUHOMS[®]-24P and -52B systems only.

A complete description of the new systems addressed by the above listed amendments, including supporting safety analysis, is located within self-contained Appendices to this FSAR as summarized in the following table:

December 2006 Revision 0

72-1004 Amendment No. 10

Amendment No.	Description	Location of Supporting Licensing Basis
3	Addition of the NUHOMS [®] -61BT DSC to the contents of the Standardized NUHOMS [®] system	Appendix K
N/A	Addition of the NUHOMS [®] -24PT2 DSC to the contents of the Standardized NUHOMS [®] system	Appendix L
4	Addition of low burnup fuel to the contents of the NUHOMS [®] -24P DSC	Chapter 3
5	Addition of the NUHOMS [®] -32PT DSC to the Standardized NUHOMS [®] system	Appendix M
6	Addition of the NUHOMS [®] -24PHB DSC to the Standardized NUHOMS [®] system	Appendix N
7	Addition of damaged fuel to the contents of the NUHOMS [®] -61BT DSC	Appendix K
	(a) Addition of the NUHOMS [®] 24PTH system to the Standardized NUHOMS [®] system	Appendix P
8	(b) Revision of the authorized contents of the 32PT DSC to include low enrichment and reconstituted fuel	Appendix M
	(c) Revision of the authorized contents of the 24PHB DSC to include additional fuel types	Appendix N
N/A	Addition of an alternate version of the HSM, designated as HSM Model 152, to the Standardized NUHOMS [®] system	Appendix R
9	Addition of FANP9 fuel to the contents of the 61BT DSC	Appendix K
	Addition of Control Components to the contents of the 32PT DSC	Appendix M
10	Addition of WE 15x15 Partial Length Shield Assemblies to the contents of the 24PTH DSC	Appendix P
10	Addition of 61BTH system to the Standardized NUHOMS [®] system	Appendix T
	Addition of 32PTH1 system to the Standardized NUHOMS [®] system	Appendix U

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M.1.1 Introduction

The NUHOMS[®] System provides a modular canister based spent fuel storage and transport system. The system includes DSCs, HSMs, and the TC.

This Appendix M provides the supporting safety analysis for the addition of the 32PT DSC system. Only those features that are being revised or added to the NUHOMS[®] System are addressed and evaluated in this Appendix. The HSM and TC designs remain unchanged. The NUHOMS[®]-32PT DSC is similar to the existing 24P DSCs with the following exceptions:

- The basket has a capability to store 32, rather than 24, Pressurized Water Reactor (PWR) fuel assemblies.
- The canister shell thickness is reduced from 0.625 inches to 0.5 inches.
- The canister has been upgraded to provide a leak tight confinement.
- The basket represents a new design.
- The canister shell length and the thickness of the top and bottom end closure assemblies have been modified to accommodate the new basket design and the revised payload.

The NUHOMS[®]-32PT DSC system is designed to store intact standard PWR fuel assemblies with or without Control Components (CCs). The NUHOMS[®]-32PT DSC system is designed for a maximum heat load of 24 kW/canister and a maximum of 1.2 kW/assembly when heat load zoning is considered. The fuel which may be stored in the NUHOMS[®]-32PT DSC is presented in Section M.2.
M.1.2 General Description of the NUHOMS[®]-32PT DSC

M.1.2.1 NUHOMS[®]-32PT DSC Characteristics

Each NUHOMS[®]-32PT DSC consists of a fuel basket and a canister body (shell, canister inner bottom and top cover plates and shield plugs). A sketch of the 32PT DSC components is shown in Figure M.1-1. A set of reference drawings is presented in Section M.1.5.

As shown in Table M.1-1, the 32PT DSC system consists of four design configurations or Types as follows:

- 32PT-S100, Short Canister (186.2 inch length)
- 32PT-L100, Long Canister (192.2 inch length)
- 32PT-S125, Short Canister (186.2 inch length)
- 32PT-L125, Long Canister (192.2 inch length)

These four design configurations allow flexibility to accommodate the payload fuel types described in Section M.2, with and without CCs. Dimensions and estimated weights of the NUHOMS[®]-32PT DSC are shown in Table M.1-1.

The thickness for the individual plate components of the top and bottom end cover plates has been increased to accommodate the higher internal pressure, while the top and bottom end shield plug thickness has been reduced relative to the 24P DSC configuration. The NUHOMS[®]-32PT DSC shell thickness is 0.50 inches instead of 0.625 inches as used for the NUHOMS[®]-24P or – 52B DSC designs. The materials used to fabricate the DSC are shown in the Parts List on Drawings NUH-32PT-1001-SAR, -1002-SAR, -1003-SAR, -1004-SAR, and -1006-SAR.

The confinement vessel for the NUHOMS[®]-32PT DSC consists of a shell which is a welded stainless steel cylinder with an integrally-welded, stainless steel bottom closure assembly; and a stainless steel top closure assembly, which includes the vent and drain system.

There are no penetrations through the confinement vessel. The draining and venting systems are covered by the seal welded outer top closure plate and vent and siphon port plugs. To preclude air in-leakage, the canister cavity is inerted and pressurized above atmospheric pressure with helium. The NUHOMS[®]-32PT DSCs are designed and tested to meet the leak tight criteria of ANSI N14.5-1997.

The basket structure consists of a grid assembly of welded stainless steel plates or tubes that make up a grid of 32 fuel compartments. Each fuel compartment accommodates aluminum and/or neutron absorbing plates (which are made of either borated aluminum or metal matrix composites such as Boralyn[®], Metamic[®] or equivalent) that provide the necessary criticality control and heat conduction paths from the fuel assemblies to the canister shell. The space between the fuel compartment grid assembly and the perimeter of the DSC shell is bridged by transition rail structures. The transition rails are solid aluminum segments that support the fuel

compartment grid assembly and transfer mechanical loads to the DSC shell. They also provide the thermal conduction path from the basket assembly to the canister shell wall, making it efficient in rejecting heat from its payload. This method of construction forms a robust structure of compartment assemblies which provides for storage of 32 fuel assemblies. The nominal clear dimension of each fuel compartment opening is 8.7 in. x 8.7 in., which provides clearance around the fuel assemblies.

During dry storage of the spent fuel in the NUHOMS[®]-32PT system, no active systems are required for the removal and dissipation of the decay heat from the fuel. The NUHOMS[®]-32PT DSC is designed to transfer the decay heat from the fuel to the basket, from the basket to the canister body and ultimately to the ambient via the HSM or TC.

Each canister is identified by a Mark Number as follows: WWW32PT-XXX-YYY-ZZZ, where: XXX is the canister type designation (S100/L100/S125/L125), YYY is the basket type designation , while WWW and ZZZ are designated by TN. Each canister is also marked with the patent number. The basket type designation, YYY, consists of a letter (A, B, C, D to designate 0, 4, 8 or 16 PRAs) and 2 numerals (16, 20 or 24 to designate the configuration of poison plates).

M.1.2.2 Operational Features

M.1.2.2.1 General Features

The NUHOMS[®]-32PT DSCs are designed to safely store 32 intact standard PWR fuel assemblies with or without CCs. The NUHOMS[®]-32PT DSC is designed to maintain the fuel cladding temperature below allowable limits during storage, short-term accident conditions, short-term off-normal conditions and fuel transfer operations.

The criticality control features of the NUHOMS[®]-32PT DSC are designed to maintain the neutron multiplication factor k-effective less than the upper subcritical limit equal to 0.95 minus benchmarking bias and modeling bias under all conditions.

M.1.2.2.2 Sequence of Operations

The sequence of operations to be performed in loading fuel into the NUHOMS[®]-32PT DSCs is presented in Chapter M.8.

M.1.2.2.3 Identification of Subjects for Safety and Reliability Analysis

M.1.2.2.3.1 Criticality Prevention

Criticality is controlled by geometry, soluble boron in spent fuel pool and by utilizing fixed neutron poison material in the fuel basket. If required, depending on fuel assembly design and initial enrichment, Poison Rod Assemblies (PRAs), as shown in Figure M.1-2 are also used for criticality control. The 32PT basket may contain 0, 4, 8 or 16 PRAs and is called a Type A, Type B, Type C, or Type D, respectively. These features are only necessary during the loading and unloading operations that occur in the loading pool (underwater). However, the PRAs are left in place following the completion of the DSC draining and drying operations which are discussed in M.8.1.3. During storage, with the DSC cavity dry and sealed from the environment, criticality

December 2006 Revision 0 control measures within the installation are not necessary because of the low reactivity of the fuel in the dry NUHOMS[®]-32PT DSC and the assurance that no water can enter the DSC cavity during storage.

M.1.2.2.3.2 Chemical Safety

There are no chemical safety hazards associated with operations of the NUHOMS[®]-32PT system.

M.1.2.2.3.3 Operation Shutdown Modes

The NUHOMS[®]-32PT DSC system is a totally passive system so that consideration of operation shutdown modes is unnecessary.

M.1.2.2.3.4 Instrumentation

No change.

M.1.2.2.3.5 Maintenance Techniques

No change.

M.1.2.3 Cask Contents

The NUHOMS[®]-32PT DSC system is designed to store 32 intact standard PWR fuel assemblies with or without CCs. Each NUHOMS[®]-32PT DSC is designed for a maximum heat load of 24 kW/canister and 1.2 kW/assembly if zoning for heat load is used. The fuel that may be stored in the NUHOMS[®]-32PT DSC is presented in Chapter M.2.

Chapter M.5 provides the shielding analysis. Chapter M.6 covers the criticality safety of the NUHOMS[®]-32PT DSC system and its contents, listing material densities, moderator ratios, and geometric configurations.

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M.2.1 Spent Fuel To Be Stored

There are four design configurations for the NUHOMS[®]-32PT DSC, two "short" canister configurations (the 32PT-S100 and 32PT-S125), and two "long" canister configurations (the 32PT-L100 and 32PT-L125). The main difference between the -S100/-L100 and -S125/-L125 configuration designs are the thicknesses of shield plugs and DSC cover plates. The basket layout for these two configurations is identical except for the length of the components. Each of the DSC configurations is designed to store 32 intact standard PWR fuel assemblies. The 32PT-L100 and 32PT-L125 are also designed to store 32 intact standard PWR fuel assemblies with or without CCs. The NUHOMS[®]-32PT DSCs can store intact PWR fuel assemblies and CCs with the characteristics described in Table M.2-1. The CCs include Burnable Poison Rod Assemblies (BPRAs), Thimble Plug Assemblies (TPAs), Control rod Assemblies (CRAs), Rod Cluster Control Assemblies (RCCAs), Axial Power Shaping Rod Assemblies (APSRAs), Orifice Rod Assemblies (ORAs), Vibration Suppression Inserts (VSIs), Neutron Source Assemblies (NSAs), and Neutron Sources. The NUHOMS®-32PT DSC may store PWR fuel assemblies arranged in any of three alternate heat zoning configurations with a maximum decay heat of 1.2 kW per assembly and a maximum heat load of 24 kW per canister. The heat load zoning configurations are shown in Figure M.2-1 through Figure M.2-3. The NUHOMS[®]-32PT DSC is inerted and backfilled with helium at the time of loading. The maximum fuel assembly weight with a CC is 1682 lbs. which is the same as the NUHOMS[®]-24P DSC design.

The maximum fuel cladding temperature limit of 400°C (752°F) is applicable to normal conditions of storage and all short term operations from spent fuel pool to ISFSI pad including vacuum drying and helium backfilling of the NUHOMS[®]-32PT DSC per Interim Staff Guidance (ISG) No. 11, Revision 2 [2.7]. In addition, ISG-11 does not permit thermal cycling of the fuel cladding with temperature differences greater than 65°C (117°F) during DSC drying, backfilling and transfer operations.

The maximum fuel cladding temperature limit of 570°C (1058°F) is applicable to accidents or off-normal thermal transients [2.7].

Calculations were performed to determine the fuel assembly type which was most limiting for each of the analyses including shielding, criticality, heat load and confinement. These evaluations are performed in Chapter M.5, M.6, M.4 and M.7. The fuel assembly types considered are listed in Table M-2-2 It was determined that the B&W 15x15 is the enveloping fuel design for the shielding source term calculation because of its total assembly weight and highest initial heavy metal loading. For criticality safety, the B&W 15x15 assembly is the most reactive assembly type for a given enrichment. This assembly is used to determine the most reactive configuration in the DSC. Using this most reactive configuration, criticality analysis for all other fuel assembly classes is performed to determine the maximum enrichment allowed as a function of number of Poison Rod Assemblies (PRAs). For thermal analysis, the WE 14x14 fuel assembly is limiting, since it results in the lowest fuel conductivity. The confinement analyses is based on B&W 15x15 fuel assembly, since it results in the smaller free volume inside the DSC cavity more than a 14x14 fuel assembly.

All four NUHOMS[®]-32PT DSC design configurations have the same minimum boron content for the poison neutron plates. The minimum boron-10 content for the poison plates is 0.0070

 g/cm^2 . The criticality analysis is based on 90% credit or 0.0063 g/cm^2 of B10. The use of 90% credit is allowed because poison material coupons are to be tested via neutron transmission plus statistical analysis of the neutron transmission results. A basket may contain 0, 4, 8, or 16 PRAs and is designated a Type A, Type B, Type C or Type D basket, respectively.

Reconstituted fuel assemblies with up to 56 solid stainless steel rods or unlimited number of lower enrichment UO_2 rods that replace fuel rods are acceptable for the 32PT DSC payload. CE 15x15 fuel assemblies with plugging clusters have also been evaluated.

Through this chapter BPRAs are considered as being representative of all CCs, unless specifically excluded.

For calculating the maximum internal pressure in the NUHOMS[®]-32PT DSC, it is assumed that 1% of the fuel rods are damaged for normal conditions, up to 10% of the fuel rods are damaged for off normal conditions, and 100% of the fuel rods will be damaged following a design basis accident event. A minimum of 100% of the fill gas and 30% of the fission gases (e.g., H-3, Kr and Xe) within the ruptured fuel rods are assumed to be available for release into the DSC cavity, consistent with NUREG-1536 [2.1].

The maximum design basis internal pressures for the NUHOMS[®]-32PT DSC are 15, 20 and 105 psig for normal, off-normal and accident conditions of storage, respectively.

M.2.1.1 General Operating Functions

No change.

PHYSICAL PARAMETERS:	
Fuel Class	Only intact (including reconstituted) B&W 15x15, WE 17x17, CE 15x15, WE 15x15, CE 14x14 and WE 14x14 class PWR assemblies or equivalent reload fuel manufactured by other vendors that are enveloped by the fuel assembly design characteristics listed in Table M.2-2.
Reconstituted Fuel Assemblies	\leq 32 assemblies per DSC with up to 56 stainless steel rods per assembly or unlimited number of lower enrichment UO ₂ rods per assembly.
Fuel Cladding Material	Zircaloy
Fuel Damage	Cladding damage in excess of pinhole leaks or hairline cracks is not authorized to be stored as "Intact PWR Fuel."
Control Components (CCs)	 Up to 32 CCs are authorized for storage in 32PT DSC. Authorized CCs include Burnable poison Rod Assemblies (BPRAs), Thimble Plug Assemblies, (TPAs), Control Rod Assemblies (CRAs), Rod Cluster Control Assemblies (RCCAs), Axial Power Shaping Rod Assemblies (APSRAs), Orifice Rod Assemblies (ORAs), Vibration Suppression Inserts (VSIs), Neutron Sources, Neutron Source Assemblies (NSAs), and Neutron Sources Design basis thermal and radiological characteristics for the CCs are listed in Table M.2-2a.
Maximum Assembly plus CC Weight	-1365 lbs for 32P1-S100 & 32P1-L100 DSC System -1682 lbs for 32PT-S125 & 32PT-L125 DSC System
CC Damage	CCs with cladding failures are acceptable for loading.
THERMAL/RADIOLOGICAL PARAMETERS:	
Fuel Burnup and Cooling Time without CCs ¹	Per Table M.2-5, Table M.2-6, Table M.2-7, Table M.2-8, Table M.2-9; and Figure M.2-1 or Figure M.2-2 or Figure M.2-3.
Fuel Burnup and Cooling Time with CCs ¹	Per Table M.2-10, Table M.2-11, Table M.2-12, Table M.2-13, Table M.2-14; and Figure M.2-1 or Figure M.2-2 or Figure M.2-3.
Initial Enrichment	Table M.2-3; and Figure M.2-4 or Figure M.2-5 or Figure M.2-6, as applicable.

 Table M.2-1

 Intact PWR Fuel Assembly Characteristics

BPRAs are considered as being representative of all CCs.

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Assembly Class	B&W 15x15	WE 17x17	CE 15x15 ^{(3), (4)}	WE 15x15	CE 14x14	WE 14x14
DSC Configuration		N	lax Unirradia	ted Length (i	n)	
32PT-S100/32PT-S125	165.75 ⁽¹⁾	165.75 ⁽¹⁾	165.75	165.75 ⁽¹⁾	165.75 ⁽¹⁾	165.75 ⁽¹⁾
32PT-L100/32PT-L125	171.71 ⁽¹⁾	171.71 ⁽¹⁾	171.71	171.71 ⁽¹⁾	171.71 ⁽¹⁾	171.71 ⁽¹⁾
Fissile Material	UO ₂	UO2	UO ₂	UO ₂	UO ₂	UO ₂
Maximum MTU/assembly ⁽²⁾	0.475	0.475	0.475	0.475	0.475	0.475
Maximum Number of Fuel Rods	208	264	216	204	176	179
Maximum Number of Guide/ Instrument Tubes	17	25	9	21	5	17

Table M.2-2 **PWR Fuel Assembly Design Characteristics**

(2) The maximum MTU/assembly is based on the shielding analysis. The listed value is higher than the actual. CE 15x15 assemblies with stainless steel plugging clusters installed are acceptable.

- (3)
- (4) Control Components are not authorized for storage with CE 15x15 class assemblies.

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⁽¹⁾ Maximum Assembly + CC Length (unirradiated)

Table M2-2aThermal and Radiological Characteristics for Control Components Stored in the
NUHOMS[®]-32PT and NUHOMS[®]-32PTH1 DSCs

Parameter	BPRAs, NSAs, CRAs, RCCAs, VSIs, Neutron Sources, and APSRAs	TPAs and ORAs
Maximum Gamma Source (γ/sec/DSC)	1.25E+15	1.3E+14
Decay Heat (Watts/DSC)	256.0	256.0

Table M.2-3
Initial Enrichment and Number of PRAs and Minimum Soluble Boron Loading
(NUHOMS [®] -32PT DSC)

	Soluble	N (io PRA Type A	s)	4 Pl (Typ	RAs be B)	8 P (Ty	RAs be C)	16 Р (Тур	RAs c D)
Assembly Class	Boron Loading (ppm)	Po Cor	ison Pla figurat	ite ion	Poison Config	l Plate uration	Poiso Config	n Plate uration	Poison Config	Plate aration
	(ppm)	16	20	24	20	24	20	24	20	24
WE 17x17 Fuel Assembly ⁽¹⁾	2500	3.40	3.40	3.40	4.00	4.00	4.50	4.50	5.00	5.00
B&W 15x15 Mark B Fuel Assembly ⁽¹⁾	2500	3.30	3.30	3.30	3.90	3.90	NE	NE	5.00	5.00
WE 15x15 Fuel Assembly (without CC)	2500	3.40	3.40	3.40	4.00	4.00	4.60	4.60	5.00	5.00
WE 15x15 Fuel Assembly (with CC)	2500	3.40	3.35	3.40	4.00	4.00	4.55	4.55	5.00	5.00
	1800	3.35	NE	3.50	NE	4.00	NE	4.35	NE	NE
	2000	3.50	NE	3.70	NE	4.20	NE	4.55	NE	NE
	2100	3.60	NE	3.80	NE	4.30	NE	4.70	NE	NE
CE 14x14 Fuel Assembly (without CC)	2200	3.70	NE	3.90	NE	4.40	NE	4.80	NE	NE
	2300	3.75	NE	4.00	NE	4.50	NE	4.90	NE	NE
	2400	3.80	NE	4.05	NE	4.60	NE	5.00	NE	NE
	2500	3.90	3.80	4.15	4.60	4.70			NE	NE
	1800	3.30	NE	3.45	NE	3.90	NE	4.25	NE	NE
	2000	3.45	NE	3.65	NE	4.10	NE	4.50	NE	NE
	2100	3.55	NE	3.75	NE	4.20	NE	4.60	NE	NE
CE 14x14 Fuel Assembly (with CC)	2200	3.60	NE	3.80	NE	4.30	NE	4.70	NE	NE
	2300	3.65	NE	3.90	NE	4.40	NE	4.80	NE	NE
	2400	3.80	NE	4.00	NE	4.50	NE	4.90	NE	NE
	2500	3.90	3.70	4.05	4.45	4.60	4.95	5.00	NE	NE
	1800	3.55	NE	3.75	NE	4.40	NE	NE	NE	NE
	2000	3.75	NE	3.90	NE	4.60	NE	NE	NE	NE
	2100	3.80	NE	4.00	NE	4.75	NE	NE	NE	NE
WE 14X14 Fuel Assembly (with and without CC)	2200	3.90	NE	4.10	NE	4.85	NE	NE	NE	NE
(what and whatout eee)	2300	4.00	NE	4.20	NE	5.00	NE	NE	NE	NE
	2400	4.10	NE	4.30	NE		NE	NE	NE	NE
	2500	4.15	4.00	4.40	5.00		NE	NE	NE	NE
	1800	3.00	NE	3.15	NE	NE	NE	NE	NE	NE
	2000	3.15	NE	3.30	NE	NE	NE	NE	NE	NE
	2100	3.20	NE	3.40	NE	NE	NE	NE	NE	NE
CE 15x15 Fuel Assembly	2200	3.30	NE	3.50	NE	NE	NE	NE	NE	NE
	2300	3.35	NE	3.55	NE	NE	NE	NE	NE	NE
	2400	3.40	NE	3.60	NE	NE	NE	NE	NE	NE NE NE NE
	2500	3.50	3.40	3.70	NE	NE	NE	NE	NE	NE

NOTES: (1) With or without CCs. CCs shall not be stored in basket location where a PRA is required. NE = Not Evaluated

Table M.2-19 Additional Design Criteria for NUHOMS[®]-32PT DSC

The Gross Weight (rounded) of the NUHOMS[©]-32PT DSC:

32PT-S100 32PT-S125 32PT-L100 32PT-L125	88,200 ⁽¹⁾ lbs. / 98,300 ⁽²⁾ lbs. 90,300 ⁽¹⁾ lbs. / 100,400 ⁽²⁾ lbs. 89,200 ⁽¹⁾ lbs. / 99,300 ⁽²⁾ lbs. 91,300 ⁽¹⁾ lbs./ 101,400 ⁽²⁾ lbs.
Payload Capacity:	up to 32 intact PWR assemblies (acceptable assemblies listed in Table M.2-2) and up to 32 CCs
Spent Fuel Characteristics:	See Table M.2-1 through Table M.2-3.

Based on fuel weight of 1365 lbs. per assembly.
 Based on fuel weight of 1682 lbs. per assembly.

M.5 Shielding Evaluation

The radiation shielding evaluation for the Standardized NUHOMS[®] System (during loading. transfer and storage) for the 24P and 52B canisters is discussed in Sections 3.3.5, 7.0 and 8.0. The following radiation shielding evaluation specifically addresses the dose rates due to designbasis PWR fuel and Control Components (CCs) loaded in a NUHOMS[®]-32PT DSC. The shielding analysis is carried out for the four DSC configurations of the NUHOMS[®]-32PT system described in Section M.2.1. The basket layout for these configurations is identical except for the length of the DSC components. For shielding purposes, the only difference between the 32PT-S100/32PT-L100 and 32PT-S125/32PT-L125 versions is the thickness of the shield plug designs. The 32PT-S100/32PT-L100 versions have somewhat thinner shield plugs than the 32PT-S125/32PT-L125 versions. Each of the configurations is designed to store up to 32 intact standard PWR fuel assemblies. The 32PT-L100 and 32PT-L125 are also designed to store up to 32 intact standard PWR fuel assemblies with or without BPRAs. Therefore, for shielding purposes, the two long-cavity versions bound the short-cavity versions because of the additional gamma source due to the CCs, such as Burnable Poison Rod Assemblies (BPRAs), Control Rod Assemblies (CRAs), Rod Cluster Control Assemblies (RCCAs), Thimble Plug Assemblies (TPAs), Axial Power Shaping Rod Assemblies (APSRAs), Orifice Rod Assemblies (ORAs) Vibration Suppression Inserts (VSIs), Neutron Source Assemblies (NSAs) and Neutron Sources. Therefore, the shielding evaluation presented herein is performed only for the 32PT-L100 and 32PT-L125 with fuel plus BPRAs. To assure that this evaluation is conservative, the fuel source terms are not adjusted to account for the additional decay required to accommodate the CCs.

The design-basis PWR fuel source terms are derived from the bounding fuel, B&W 15x15 Mark B assembly design as described in Section M.5.2

The NUHOMS[®]-32PT DSCs can store intact (including reconstituted) PWR fuel assemblies and BPRAs with the characteristics described in Table M.2-1. The NUHOMS[®]-32PT DSC may store PWR fuel assemblies arranged in any of three alternate heat zoning configurations with a maximum decay heat of 1.2 kW per assembly and a maximum heat load of 24 kW per canister. The heat load configurations are shown in Figure M.2-1, Figure M.2-2 and Figure M.2-3. Note that while the B&W, CE, and Westinghouse fuel designs are specifically listed, storing reload fuel designed by other manufacturers is also allowed provided an analysis is performed to demonstrate that the limiting features listed in Table M.2-1 bound the specific manufacturers replacement fuel. The limiting features are burnup, initial enrichment, cooling time, fissile material type, number of fuel rods, number of guide tube/instrument tube holes, cobalt impurities in the hardware and initial heavy metal.

The design-basis fuel source terms for this evaluation are defined as the source terms from fuel with the burnup/initial enrichment/cooling time combination given in Table M.2-5 through Table M.2-9 (without CCs) and located in the basket as shown in Figure M.2-1, Figure M.2-2 or Figure | M.2-3, that gives the maximum dose rate on the surface of the HSM and/or OS197/OS197H Transfer Cask (TC). This approach is consistent with the method used to generate the fuel qualification tables for the Standardized NUHOMS[®]-24P and -52B canister designs as described in Section 7.2.3.

The Heat Load Zoning Configuration 2 (Figure M.2-2) is the configuration that produces the highest dose rates on the surfaces of the HSM and TCs. These bounding gamma and neutron source terms are then used in the radiation shielding models to conservatively calculate dose rates on and around the NUHOMS[®]-32PT system. In order to model Heat Load Zoning Configuration 2, all sixteen assemblies in the outer ring of the DSC are modeled with source terms consistent with 1.2 kW. Therefore, the source terms result in fairly conservative dose rates because the shielding analysis is based on a 28.8 kW heat load compared to the 24 kW heat load limit.

The bounding burnup, minimum initial enrichment and cooling time combinations used in this analysis are as follows:

- 30 GWd/MTU, 2.5 wt. % U-235, 8-year cooled Inner sixteen assemblies in the HSM models,
- 41 GWd/MTU, 3.1 wt. % U-235, 5-year cooled Outer sixteen assemblies in the HSM and TC models, and
- 45 GWd/MTU, 3.3 wt. % U-235, 23-year cooled Inner sixteen assemblies in the TC models.

The design-basis source terms for the authorized CCs are taken from Appendix J. The designbasis source terms are based on three bounding CC designs: (1) B&W 15x15 Burnable Absorber Assemblies with up to 2 cycles burnup and 5-year cooled, (2) WE 17x17 Pyrex Burnable Absorber, 2-24 Rodlets with up to 2 cycles burnup and 10-year cooled, and (3) WE 17x17 WABA Burnable Absorber, 3-24 Rodlets with up to 2 cycles burnup and 10-year cooled. The properties used in Appendix J to calculate the design-basis source terms are reproduced in Table M.5-2.

The design basis CC source term that envelops all CCs allowed in the 32PT DSCs is taken from Appendix J for BPRAs with burnups up to 36 GWd/MTU. While Appendix J was developed to specifically address the additional source from a BPRA, this source term is selected as the bounding source term for all CCs. The TPAs and ORAs do not extend into the active fuel region of a fuel assembly. Therefore, they are limited to the source term equivalent to the top plus plenum region source term of a BPRA. However, tube conservative, the full total source term of BPRA is used in the shielding analysis to bound all CCs. The source term energy distribution is shown in Table M.5-12. Any CC to be stored in a 32PT DSC must be bounded by this source term.

Reconstituted fuel assembly is an intact fuel assembly in which one or more enriched fuel rods have been replaced with either stainless steel rods or zircaloy clad rods with depleted, natural or lower than original enriched uranium dioxide as fuel material referred to as "lower enrichment UO_2 rods" in this section.

The replacement rod is of similar outside dimensions as the original fuel rod, displacing the same amount of water in the fuel matrix. The lower enrichment UO_2 rods are of similar design and behavior as the standard fuel rods aside from the uranium enrichment.

Reconstituted fuel assemblies with up to 56 solid stainless steel rods or unlimited number of lower enrichment UO_2 rods that replace fuel rods are also acceptable for the 32PT DSC payload.

The reconstituted rods may be placed at any location in the fuel assembly and the reconstituted assemblies may be placed anywhere in the basket. The cooling time required for reconstituted fuel assembly is increased consistent with the fuel qualification Table M.2-5 through Table M.2-9.

CE 15x15 fuel assemblies with plugging clusters having a nominal mass of 2.3 kg 304L stainless steel (including 0.1 kg Inconel x-750) are evaluated. The material weights in the top, plenum and the incore region (including the weight of the heavy metals) used for the design basis source term calculation bound the CE 15x15 fuel assembly with plugging clusters.

The methodology, assumptions, and criteria used in this evaluation are summarized in the following subsections.

M.5.1 Discussion and Results

The maximum dose rates due to 32 design-basis PWR fuel assemblies with BPRAs in the NUHOMS[®]-32PT DSC loaded into the Standardized NUHOMS[®]-HSM are summarized in Table M.5-3 for both the 32PT-S100/32PT-L100 and 32PT-S125/32PT-L125 design configurations. Table M.5-4 provides maximum and surface average dose rates on the HSM loaded with the NUHOMS[®]-32PT DSC for both the 32PT-S100/32PT-L100 and 32PT-S125/32PT-L125 design configurations. Table M.5-5 provides a summary of the dose rates on and around the TC for canister transfer for 32PT-S100/32PT-L100 and 32PT-S125/32PT-L125 configurations. The dose rates in these tables are for the bounding Configuration 2.

A basket with two alternate poison plate configurations is also considered. One is a 16 poison plate and the second is a 24 poison plate configuration. Since the total weight of the material in the basket is the same as the original poison plate configuration, the results calculated here are also applicable to baskets with these alternate poison plate configurations.

A discussion of the method used to determine the design-basis fuel and CC source terms is included in Section M.5.2. The model specification and shielding material densities are given in Section M.5.3. The method used to determine the dose rates due to 32 design-basis fuel assemblies with CCs in the NUHOMS[®]-32PT DSC design configurations is provided in Section M.5.4. Thermal and radiological source terms are calculated with the SAS2H/ORIGEN-S modules of SCALE 4.4 [5.1] for the fuel. The shielding evaluation is performed with the DORT [5.2] code with the CASK-81 cross section library [5.3]. Sample input files used for calculating neutron and gamma source terms and dose rates are included in Section M.5.5.1.

M.5.2 Source Specification

Thermal and radiological source terms are calculated with the SAS2H/ORIGEN-S modules of SCALE 4.4 [5.1] for the fuel. The SAS2H/ORIGEN-S results are used to develop the fuel qualification tables listed in Table M.2-5 through Table M.2-14 and the design-basis fuel source terms suitable for use in the shielding calculations. The thermal and radiological source terms for the CCs are taken from Appendix J.

The B&W 15x15 assembly is the bounding fuel assembly design for shielding purposes because it has the highest initial heavy metal loading as compared to the 14x14, other 15x15, and 17x17 fuel assemblies which are also authorized contents of the NUHOMS®-32PT DSC. In addition. the maximum Co59 content of the hardware regions for each assembly type is less than that of the B&W 15x15 Mark B fuel assembly. The neutron flux during reactor operation is peaked in the in-core region of the fuel assembly and drops off rapidly outside the in-core region. Much of the fuel assembly hardware is outside of the in-core region of the fuel assembly. To account for this reduction in neutron flux, the fuel assembly is divided into four exposure "regions." The four axial regions used in the source term calculation are: the bottom (nozzle) region, the in-core region, the (gas) plenum region, and the top (nozzle) region. The B&W 15x15 fuel assembly masses for each irradiation region are listed in Table M.5-6. The light elements that make up the various materials for the various fuel assembly materials are taken from reference [5.4] and are listed in Table M.5-7. The design-basis heavy metal weight is 0.475 MTU. These masses are irradiated in the appropriate fuel assembly region in the SAS2H/ORIGEN-S models. To account for the reduction in neutron flux outside the In-Core regions neutron flux (fluence) correction factors are applied to light element composition for each region. The neutron flux correction factors are given in Table M.5-8.

The original fuel qualification tables are generated based on the decay heat limits for the various heat load zoning configurations shown in Figure M.2-1, Figure M.2-2 and Figure M.2-3. SAS2H is used to calculate the minimum required cooling time as a function of assembly initial enrichment and burnup for each decay heat limit. The total decay heat includes the contribution from the fuel as well as the hardware in the entire assembly. The fuel qualification table for fuel plus CCs also includes 8 watts per CC to account for the design-basis decay heat from the CCs. Because the decay heat generally increases slightly with decreasing enrichment for a given burnup, it is conservative to assume that the required cooling time for a higher enrichment assembly is the same as that for a lower enrichment assembly with the same burnup. The required cooling time for initial enrichments that fall between any two SAS2H runs are assumed to be that of the lower enrichment case results. The method in by which these expanded tables were developed differ slightly than the original method. However, the computer programs used and general approach remain unchanged. The expanded FQT decay times are generated by selecting cooling times such that the design basis source terms remain bounding and all decay heat limits are met.

The original FQT's were developed for U-235 enrichments in the range 2.0-5.0 wt.% and burnup in the range 10-45 GWd/MTU. The FQT's without CCs are expanded to also include fuel with a lower enrichment range of 1.1 to 1.9 wt.% U-235. The FQT's with CCs have not been modified.

Reconstituted fuel assemblies containing up to 56 stainless steel rods that replace fuel rods are also acceptable for the 32PT DSC payload provided the cooling time requirements of the fuel qualification tables are met. Additional discussion of the methodology used to evaluate reconstituted fuel assemblies is provided in Section M.5.2.5.

The design-basis source terms for the authorized CCs are defined as the burnup/initial enrichment/cooling time combination given in the fuel qualification tables that result in the maximum dose rate on the surface of the HSM and OS197/OS197H TC. The cooling times for the expanded fuel qualification table entries are selected so that the design-basis source terms remain bounding. The 1-D discrete ordinates code ANISN [5.5] and the CASK-81 22 neutron, 18 gamma-ray energy group, coupled cross-section library [5.3] is used to determine these design-basis source terms. Finding the burnup/initial enrichment/cooling time combinations from the fuel qualification tables and decay heat load zoning configurations that produce the maximum dose rate on the HSM roof determine the design-basis source term for the HSM shielding calculations. Similarly the design-basis source terms for the OS197/OS197H TC are determined by finding the maximum surface dose rates on the side of the cask. This approach, described in detail in Section M.5.2.4, is consistent with the method used to determine the fuel qualification tables for the Standardized NUHOMS[®] canister designs described in Section 7.2.3.

The radiological source terms generated in the SAS2H/ORIGEN-2 runs are used in the ANISN evaluations to calculate the surface dose rates. The ANISN models are similar to the appropriate DORT models for the locations of interest. Heat load configuration 2 (Figure M.2-2) produced the bounding total surface dose rate for both the HSM and TC. The HSM design-basis source terms for the outer ring of assemblies (modeled as sixteen assemblies) are from fuel with 41 GWd/MTU burnup, an initial enrichment of 3.1 wt. % U-235 and 5-years cooling. The HSM design-basis source terms for the inner sixteen assemblies are from fuel with 30 GWd/MTU burnup, and initial enrichment of 2.5 wt. % U-235 and 8-years cooling. Note that using this approach in modeling the outer ring of sixteen assemblies with the 1.2 kW source terms for all of the shielding analyses results in fairly conservative dose rates because the shielding analysis is in reality based on a 28.8 kW heat load. The TC design-basis source terms for the outer ring of 3.1 wt. % U-235 and 5-years cooling. The C design-basis source terms for the inner sixteen assemblies) are from fuel with 41 GWd/MTU burnup, an initial enrichment of 3.1 wt. % U-235 and 5-years cooling. Note that using this approach in modeling the outer ring of sixteen assemblies with the 1.2 kW source terms for all of the shielding analyses results in fairly conservative dose rates because the shielding analysis is in reality based on a 28.8 kW heat load. The TC design-basis source terms for the outer ring of assemblies (conservatively modeled as sixteen assemblies) are from fuel with 41 GWd/MTU burnup, an initial enrichment of 3.1 wt. % U-235 and 5-years cooling. The TC design-basis source terms for the inner sixteen assemblies are from fuel with 45 GWd/MTU burnup, and initial enrichment of 3.3 wt. % U-235 and 23-years cooling.

A sample SAS2H/ORIGEN-S input file for the In-Core Region for the 41 GWd/MTU, 3.1 wt. % U-235 and 5-years cooling case is listed and commented in Section M.5.5.1.

M.5.2.1 Gamma Source

Four SAS2H/ORIGEN-S runs are required for each burnup/initial enrichment/cooling time combination to determine gamma source terms for the four regions of interest for each fuel assembly; the bottom, in-core, plenum and top regions. The only difference between the runs is in Block #10 "Light Elements" of the SAS2H input and the 81\$\$ card in the ORIGEN-S input. Each run includes the appropriate Light Elements for the region being evaluated and the 81\$\$ card is adjusted to have ORIGEN-S output the total gamma source for the in-core region and only the light element source for the plenum and top nozzle regions.

The design-basis source terms for the authorized CC designs are taken from Appendix J of the FSAR. The design-basis CC source terms from Appendix J of the FSAR are based on three bounding BPRA designs 1) B&W 15x15 Burnable Absorber Assemblies with up to 2 cycles burnup and 5-year cooled, 2) WE 17x17 Pyrex Burnable Absorber, 2-24 Rodlets with up to 2 cycles burnup and 10-year cooled, and 3) WE 17x17 WABA Burnable Absorber, 3-24 Rodlets with up to 2 cycles burnup and 10-year cooled.

All other CCs, including BPRA types other than the three analyzed above, must be examined on a case by case basis to demonstrate that they are bounded by the design basis CC source. Specifically, the maximum allowed CC gamma source is $1.24E+15 \gamma/s/canister$ for BPRAs, NSAs, CRAs, and BAs and $1.30E+14 \gamma/s/canister$ for TPAs.

The SAS2H/ORIGEN-S gamma ray source is output in the CASK-81 energy group structure.

Gamma source terms for the in-core region include contributions from actinides, fission products, and activation product. The bottom, plenum and top nozzle regions include the contribution from the activation products in the specified region only. These results for the 41 GWd/MTU, 3.1 wt. % U-235 and 5-years cooling case are shown in Table M.5-9. The results for the 30 GWd/MTU, 2.5 wt. % U-235 and 8-years cooling case are shown in Table M.5-10. Finally, the results for the 45 GWd/MTU, 3.3 wt. % U-235 and 23-years cooling case are shown in Table M.5-11.

As stated above the design-basis CC source terms are taken from Appendix J of the FSAR and are listed in Table M.5-12.

Gamma source terms for use in the shielding models are calculated by multiplying the assembly sources by the number of assemblies in the region of interest (16) and dividing by the appropriate inner/outer heat load region volume. The appropriate assembly region volumes for both the inner and outer heat load zones are listed in Table M.5-13.

M.5.2.2 Neutron Source Term

One SAS2H/ORIGEN-S run is required for each burnup/initial enrichment/cooling time combination to determine the total neutron source terms for the in-core regions. The results for each burnup/initial enrichment/cooling time combination of interest are summarized in Table M.5-14.

Neutron source terms for use in the shielding models are calculated by multiplying the assembly sources by the number of assemblies in the in-core region of interest (16) and dividing by the appropriate in-core inner/outer heat load region volume. The appropriate assembly region volumes for both the inner and outer heat load regions are listed in Table M.5-13.

M.5.2.3 Axial Peaking

Axial peaking factors for both neutron and gamma sources in PWR fuel are taken from Reference [5.6]. These peaking factors were derived from work performed by the Department of Energy in support of its Topical Report for burnup credit [5.7]. The neutron and gamma peaking factors are shown as a function of the core height in Table M.5-15. These factors are directly

applied to each DORT interval in the fuel region. Neutron peaking factors in each zone are equal to the gamma factor raised to the fourth power to correctly account for the variation of neutron source with burnup. The axial source distribution defined in Table M.5-15 introduces some level of conservatism into this calculation because the length average peaking factor of 1.06 is greater than 1.

M.5.2.4 ANISN Evaluation for Bounding Source Terms

As discussed above, the original fuel qualification tables are generated based on the decay heat limits for the various heat load zoning configurations shown in Figure M.2-1, Figure M.2-2 and Figure M.2-3. The expanded fuel qualification table decay times are generated by selecting cooling times such that the design-basis source terms remain bounding and all decay heat limits are met. SAS2H is used to calculate the minimum required cooling time as a function of assembly initial enrichment and burnup for each decay heat limit. To determine which configuration and burnup, wt. % initial enrichment and cooling time combinations result in the bounding dose rates on the surface of the HSM and TC, the total source term, which includes the contribution from the fuel as well as the hardware in the entire assembly (including end fittings) is used to calculate its total ANISN dose rate on the HSM roof and TC radial using the ANISN code.

The CC contribution is fixed and is included in the design basis shielding evaluation as such and therefore is not included in this ANISN evaluation.

ANISN [5.5] determines the fluence of particles throughout one-dimensional geometric systems by solving the Boltzmann transport equation using the method of discrete ordinates. Particles can be generated by either particle interaction with the transport medium or extraneous sources incident upon the system. Anisotropic cross-sections can be expressed in a Legendre expansion of arbitrary order.

The ANISN code implements the discrete ordinates method as its primary mode of operation. Balance equations are solved for the flow of particles moving in a set of discrete directions in each cell of a space mesh and in each group of a multigroup energy structure. Iterations are performed until all implicitness in the coupling of cells, directions, groups, and source regeneration is resolved.

ANISN coupled with the CASK-81 22 neutron, 18 gamma-ray energy group, coupled crosssection library [5.3] and the ANSI/ANS-6.1.1-1977 flux-to-dose conversion factors [5.10] is chosen to generate the ANISN dose rates used to determine the relative strength of the various source terms from fuel assemblies to determine the design basis source terms for the HSM and TC. These design basis source terms are used with DORT to calculate the bounding system dose rates. ANISN provides an efficient method to calculate the design basis source terms.

The surface dose rates for the original fuel qualification tables are calculated using individual ANISN models to perform the evaluation for the fuel assembly parameters in the fuel qualification table. The ANISN model used to calculate the relative dose rates on the HSM surface is similar to the cut through the center of the DORT HSM roof model used for the shielding evaluation (for each configuration). The ANISN model used to generate the relative dose rates on the TC is similar to the cut through the center of the DORT TC side model used for

the shielding evaluation. Figure M.5-31 and Figure M.5-32 provide sketches for the ANISN models of the HSM roof and TC centerline, respectively. When modeling 0.63 kW or 0.60 kW source region in Region A (16 assemblies) of Figure M.5-31 and Figure M.5-32, the Region B does not include any source terms. Similarly, when modeling 0.87 kW or 1.2 kW source region in Region B (16 assemblies), of these figures, the Region A does not include any source terms.

M.5.3 Model Specification

M.5.3.1 Material Densities

With the exception of the DSC basket and fuel, all material densities are taken directly from the calculations used to support Section 7 of the FSAR.

The material weight given in Table M.5-6 for the fuel assembly and Table M.5-2 for the CCs are used to calculate material densities for in-core, plenum, top and bottom regions of the fuel assembly. The poison in the CCs is modeled as pure aluminum because it is a relatively light element with little shielding capability. In addition, while the source terms account for 32 CCs the material densities conservatively account for only 24 CCs. For the HSM axial dose rates and all of the TC calculations, only 20% of the steel plates used to form the fuel compartments is modeled in the shielding analysis. All other components of the basket such as the neutron poison material; aluminum plates, etc., have been conservatively neglected for all models. For the lateral HSM DORT shielding model only, the homogenized fuel regions also include all of the steel from the DSC basket inner fuel compartment. The zircaloy is modeled as Zr and the inconel, carbon steel and stainless steel are all modeled as Fe. This assumption has little effect on the dose rate results. The smeared active fuel region volume of the basket is the sum of the inner and outer heat load region volumes given in Table M.5-13.

In order to account for subcritical multiplication, an initial enrichment of \sim 4.9 wt. % U-235 is used to calculate the amount of U-235 in the shielding models. For an initial enrichment of \sim 4.9%, there are 23,044 grams of U-235 per assembly and 451,956 grams of U-238.

The material densities used in the various models are summarized in Table M.5-16.

M.5.4 Shielding Evaluation

Dose rate contributions from the bottom, in core, plenum and top regions, as appropriate, from 32 fuel assemblies with CCs are calculated with the DORT Code [5.2] at various location on and around the NUHOMS[®]-32PT DSCs, HSM, and OS197/OS197H TC.

The radiation shielding evaluation for the Standardized NUHOMS[®] System during loading, transfer and storage for the 24P and 52B canisters is discussed in Sections 3.3.5, 7.0 and 8.0 of the FSAR. The following shielding evaluation discussion specifically addresses the NUHOMS[®]-32PT-S100/32PT-L100 and 32PT-S125/32PT-L125 DSCs in an HSM and TC using the design-basis source terms determined in Section M.5.2.

M.5.4.1 Computer Programs

DORT [5.2] determines the fluence of particles throughout one-dimensional or two-dimensional geometric systems by solving the Boltzmann transport equation using either the method of discrete ordinates or a diffusion theory approximation. Particles can be generated by either particle interaction with the transport medium or extraneous sources incident upon the system. Anisotropic cross-sections can be expressed in a Legendre expansion of arbitrary order.

The DORT code implements the discrete ordinates method as its primary mode of operation. Balance equations are solved for the flow of particles moving in a set of discrete directions in each cell of a space mesh and in each group of a multigroup energy structure. Iterations are performed until all implicitness in the coupling of cells, directions, groups, and source regeneration is resolved.

DORT was chosen for this application because of its ability to solve two dimensional, cylindrical, deep penetration radiation transport problems similar to the NUHOMS[®] System.

M.5.4.2 Spatial Source Distribution

The source components are:

- The neutron sources due to the active fuel regions of the inner sixteen and outer sixteen fuel assemblies,
- The gamma source due to the active fuel regions of the inner sixteen and outer sixteen fuel assemblies,
- The gamma source due to the plenum regions of the inner sixteen and outer sixteen fuel assemblies,
- The gamma source due to the top regions of the inner sixteen and outer sixteen fuel assemblies,
- The gamma source due to the bottom region of the inner sixteen and outer sixteen fuel assemblies,

- The gamma source due to the 32 CCs in the active fuel region,
- The gamma source due to the 32 CCs in the plenum region, and
- The gamma source due to the 32 CCs in the top region.

The U-235 fission spectrum is input into the 1* array of the DORT input file to account for subcritical multiplication, increasing the neutron source in the active fuel region. Axial peaking is accounted for in the active fuel region by inputting a relative flux factor at each node in the 97* array. The flux factor data is discussed in Section M.5.2.3.

M.5.4.3 Cross Section Data

The cross-section data used in this analysis is taken from the CASK-81 22 neutron, 18 gammaray energy group, coupled cross-section library [5.3]. CASK-81 is an industry standard crosssection library compiled for performing calculations of spent fuel shipping casks and is distributed by ORNL/RSIC. The cross-section data allows coupled neutron/gamma-ray dose rate evaluation to be made that account for secondary gamma radiation (n,γ) .

Microscopic P_3 cross-sections are taken from the CASK-81 library and mixed using the GIP-PC computer program distributed with DORT [5.2] to provide macroscopic cross-sections for the materials in the cask model.

An additional element and material, "fluxdosium," is included in the cross-section data and mixing table in the GIP input file. Fluxdosium is used to provide flux-to-dose rate conversion factors as described in Section M.5.4.4 for use in activity calculations. The presence of fluxdosium in the cross-section data does not affect the actual flux calculations.

M.5.4.4 Flux-to-Dose-Rate Conversion

The flux distribution calculated by the DORT code is converted to dose rates using the same flux-to-dose rate conversion factors as those used in the FSAR from ANSI/ANS-6.1.1-1977. The flux-to-dose rate conversion factors are entered into DORT through the cross section tables as material "fluxdosium".

The dose rate at each node in the DORT models is calculated using the activity calculation feature of DORT. The "cross-section" data for "fluxdosium" is specified for the activity calculations, which determine the gamma and neutron dose rate at each node.

M.5.4.5 Methodology

The methodologies used in this calculation are similar to those previously used to support NUHOMS[®] storage and transportation applications. The computer codes, basic modeling techniques, and analyses are based in large part on those used to support the Sacramento Municipal Utility Districts storage license at their Rancho Seco Nuclear Generating Station (TAC Number L10017, Materials License Number SNM-2510) and to support the certificate of compliance application for the NUHOMS[®]-61BT storage system [5.8]. The methodology used herein is summarized below.

Assembly Class	B&W 15x15	WE 17x17	CE 15x15	WE 15x15	CE 14x14	WE 14x14
DSC Configuration		M	ax Unirradia	ted Length (in)	
32PT-S100	165.75	165.75	165.75	165.75	165.75	165.75
32PT-L100	171.71 ⁽¹⁾	171.71 ⁽¹⁾	171.71	171.71	171.71	171.71
32PT-S125	165.75	165.75	165.75	165.75	165.75	165.75
32PT-L125	171.71 ⁽¹⁾	171.71 ⁽¹⁾	171.71	171.71	171.71	171.71
Fissile Material	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂
Maximum MTU/assembly ⁽²⁾	0.475	0.475	0.475	0.475	0.475	0.475
Maximum Number of Fuel Rods	208	264	216	204	176	179
Maximum Number of Guide/ Instrument Tubes	17	25	9	21	5	17

Table M.5-1 PWR Fuel Assembly Design Characteristics⁽³⁾

(1) Maximum Assembly + CC Length (unirradiated)
 (2) The maximum MTU/assembly is based on the shielding analysis. The listed value is higher than the actual.
 (3) Maximum Co-59 content in the Top End Fitting Region is 15.6 grams per assembly. Maximum Co-59 content in the Plenum Region is 5.0 grams per assembly. Maximum Co-59 content in the In-Core Region is 24.7 grams per assembly. Maximum Co-59 content in the Bottom Region is 12.8 grams per assembly.

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Dose Rate Location	C 32PT-S100	Configuration /32PT-L100 E Configuration	2 DSC Design	Configuration 2 32PT-S125/32PT-L125 DSC Design Configurations			
	Gamma (mrem/hr)	Neutron (mrem/hr)	Total ⁽¹⁾ (mrem/hr)	Gamma (mrem/hr)	Neutron (mrem/hr)	Total ⁽¹⁾ (mrem/hr)	
HSM Roof (centerline)	38.6	0.6	39.2	38.6	0.6	39.2	
HSM Roof Birdscreen	1201	16.9	1218	1201	16.9	1218	
HSM End Shield Wall Surface	5.4	0.2	5.6	5.4	0.2	5.6	
HSM Door Exterior Surface (centerline)	158	36.3	185	77.5	28.1	99.3	
HSM Front Birdscreen	780	7.3	788	745	6.8	752	
HSM Back Shield Wall	1.45	0.05	1.50	1.37	0.05	1.41	
Centerline Top DSC Cover Plate w/3"ns3+1" steel Dry Welding	123	18.7	142	36.7	15.0	51.7	
Outer Edge Centerline Top DSC (Peak Annulus)	3834	132	3966	1458	111	1569	
Cask Surface (Radial) Contact Normal Condition	784	261	950	784	259	947	
3 ft from Cask Surface (Radial) Normal Condition	293	98.3	391	293	97.8	390	
Cask Surface (Radial) Contact Accident Condition	1070	3780	4640	1070	3770	4630	
Cask Top Axial Surface	94.8	32.6	107	37.7	27.5	48.7	
Cask Bottom Axial Surface	758 ⁽²⁾	957 ⁽²⁾	1707 ⁽²⁾	193 ⁽³⁾	770 ⁽³⁾	960 ⁽³⁾	

 Table M.5-3

 Dose Rates Due to the 32 PWR Fuel Assemblies with CCs

Notes:

⁽¹⁾ Gamma and Neutron peaks do not always occur at same location therefore the total is not always the sum of the gamma plus neutron.

(2) The peak bottom surface dose rate is directly below the grapple ring cut out in the bottom of the cask. The bottom average dose rates, including the grapple area, are 170 mrem/hr gamma, 115 mrem/hr neutron for a total average dose rate of 285 mrem/hr.

(3) The peak bottom surface dose rate is directly below the grapple ring cut out in the bottom of the cask. The bottom average dose rates, including the grapple area, are 48.7 mrem/hr gamma, 92.3 mrem/hr neutron for a total average dose rate of 141 mrem/hr.

CASK-81 Energy Group	E _{upper} (MeV)	E _{mean} (MeV)	Top Region γ/s/BPRA	Plenum Region γ/s/BPRA	Fuel Region γ/s/BPRA
23	10	9	0.000E+00	0.000E+00	0.000E+00
24	8	7.25	0.000E+00	0.000E+00	0.000E+00
25	6.5	5.75	0.000E+00	0.000E+00	0.000E+00
26	5	4.5	0.000E+00	0.000E+00	0.000E+00
27	4	3.5	3.947E-15	6.520E-14	7.266E-18
28	3	2.75	3.942E+04	2.179E+04	5.495E+05
29	2.5	2.25	1.274E+07	7.040E+06	1.775E+08
30	2	1.83	9.577E+01	8.812E+01	9.153E-05
31	1.66	1.495	7.138E+11	3.946E+11	9.953E+12
32	1.33	1.165	1.690E+12	9.340E+11	2.356E+13
33	1	0.9	6.951E+09	4.180E+09	4.699E+09
34	0.8	0.7	4.155E+09	1.783E+10	2.835E+09
35	0.6	0.5	3.235E+07	3.854E+10	4.508E+08
36	0.4	0.35	7.014E+07	2.431E+10	9.776E+08
37	0.3	0.25	2.060E+08	3.482E+09	2.872E+09
38	0.2	0.15	1.217E+09	3.534E+09	1.697E+10
39	0.1	0.075	8.191E+09	5.176E+09	1.142E+11
40	0.05	0.025	8.484E+10	1.382E+11	1.170E+12
	Total		2.509E+12	1.564E+12	3.483E+13

Table M.5-12 Design-Basis CC Source Terms

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M.6.1 Discussion and Results

Figure M.6-1 shows the cross section of the NUHOMS[®]-32PT DSC. The NUHOMS[®]-32PT DSC stainless steel basket consists of a welded plate or tube design. The welded plates or tubes form 32 compartments with sufficient space to accommodate aluminum or poison/aluminum inserts and a PWR fuel assembly. The fuel compartment structure is connected to perimeter transition rail assemblies as shown on the drawings in Section M.1.5. The poison/aluminum plates and aluminum plates are located inside the fuel compartments. The poison plates may be arranged in any of the following configurations: a 20 poison plate configuration (base configuration), as shown in Figure M.6-1; an alternate 16 poison plate configuration, as shown in Figure M.6-1; an alternate 16 poison plate configuration, as shown in Figure M.6-14. Figure M.6-2 through Figure M.6-4 show the fuel compartments that must contain PRAs for loading configurations that require four, eight or sixteen PRAs. The 20 poison plate basket configurations shown in Figure M.6-14 is analyzed as a Type A/B/C/D basket while the 24 poison plate basket configurations shown in Figure M.6-14 is analyzed as an Alternate Type A/B/C/D basket. The 16 poison plate basket configuration shown in Figure M.6-13 is also analyzed as an Alternate Type A basket.

The analysis presented herein is performed for a NUHOMS[®]-32PT DSC in the NUHOMS[®] OS197/197H Transfer Casks (TCs) during normal and accident loading conditions. The NUHOMS[®] OS197/197H TCs consists of an inner stainless steel shell, lead gamma shield, a stainless steel structural shell and a hydrogenous (liquid) neutron shield. This analysis is applicable to any licensed cask of similar construction. The NUHOMS[®]-32PT DSC/TC configuration is shown to be sub-critical under normal and accident conditions of loading, transfer and storage.

The criticality analysis determines the most reactive configuration for the basket and assembly location. Then criticality calculations evaluate a variety of fuel assembly types, initial enrichments and PRA configurations. Finally, the maximum allowed initial enrichment for each assembly type/PRA configuration is determined. The maximum allowed initial enrichment for each assembly type/PRA configuration is listed in Table M.6-1. The calculations determine k_{eff} with the CSAS25 control module of SCALE-4.4 [6-1] for each assembly type/PRA configuration and initial enrichment, including all uncertainties to assure criticality safety under all credible conditions.

The results of the evaluation presented include reconstituted fuel assemblies where fuel pins are replaced with up to 56 solid stainless steel rods or an unlimited number of lower enriched UO_2 rods of the same diameter as the fuel pins.

The Control Components (CCs) are also authorized for storage in the 32PT DSC. The authorized CCs are Burnable Poison Rod Assemblies (BPRAs), Control Rod Assemblies (CRAs), Rod Cluster Control Assemblies (RCCAs), Thimble Plug Assemblies (TPAs), Axial Power Shaping Rod Assemblies (APSRAs), Orifice Rod Assemblies (ORAs), Vibration Suppressor Inserts (VSIs), Neutron Source Assemblies (NSAs), and Neutron Sources.

The results of the evaluation demonstrate that the maximum expected k_{eff} , including statistical uncertainty, will be less than the Upper Subcritical Limit (USL) determined from a statistical analysis of benchmark criticality experiments. The statistical analysis procedure includes a confidence band with an administrative safety margin of 0.05.

M.6.2 Package Fuel Loading

The NUHOMS[®]-32PT DSC is capable of transferring and storing PWR fuel assemblies. Table M.6-2 lists the fuel assemblies considered as authorized contents of the NUHOMS[®]-32PT DSC.

Table M.6-3 lists the fuel parameters for the PWR fuel assemblies. Reload fuel from other manufacture's with the same parameters are also considered as authorized contents.

For the WE 17x17, BW 15x15, WE 15x15, CE 14x14, and WE 14x14 class assemblies CCs are also included as authorized contents. The only change to the package fuel loading to evaluate the addition of these CCs is replacing the borated water in the water holes with ${}^{11}B_4C$. Since these CCs displace borated moderator in the assembly guide and or instrument tubes, an evaluation is performed to determine the potential impact of storage of CCs that extend into the active fuel region on the system reactivity. For CCs such as CRAs and BPRAs no credit is taken for the cladding and absorbers; rather the CCs are modeled as ${}^{11}B_4C$ in the entire tube of the respective design. Thus, the highly borated moderator in the tube is modeled as ${}^{11}B_4C$. The inclusion of more Boron-11 and carbon enhances neutron scattering causing the neutron population in the fuel assembly to be slightly increased which increases reactivity. Therefore, these calculations bound any CC design that is compatible with WE 17x17, BW 15x15 and WE 14x14 class assemblies. CCs that do not extend into the active fuel region of the assembly do not have any effect on the reactivity of the system as evaluated because only the active fuel region is modeled in this evaluation with periodic boundary conditions making the model infinite in the axial direction. The fuel assembly dimensions reported in Table M.6-3 remain unchanged for the CC cases. The models that include CCs only differ in that the region inside the guide tubes and instrument tube are modeled as ${}^{11}B_4C$ instead of moderator of PRAs. Additionally, the presences of non-multiplying sources like the NSAs have no impact on criticality calculations.

Since the criticality analysis models simulate only the active fuel height, any CC that is inserted into the fuel assembly such that it does not extend into the active fuel region is considered as authorized for storage without additional calculations as required for control components that extend into the active fuel region. For example, TPAs or ORAs are permitted for storage from a criticality standpoint, without any further calculations that model these CCs, since TPAs or ORAs do not extend into the active fuel region.

Table M.6-4 lists the minimum B₄C contents for PRAs for the various assembly classes. The linear B₄C content per PRA rod used in the KENO V.a model is calculated by multiplying the B₄C density modeled by the cross-sectional area of the poison rod as modeled. Taking the modeled linear B₄C content and dividing by 0.75, to account for the fact that we only take credit for 75% of the B-10 in the analysis, calculates the minimum linear B₄C content per PRA rod specified in Table M.6-4. For example, the modeled B₄C density is 0.756 g/cm³. For the B&W 15 x15 PRA, the poison in the PRA is modeled with a radius of 0.55 cm. The cross sectional area of the poison is therefore $\pi(0.55)^2$ or 0.950 cm². Therefore, the modeled linear B₄C density is 0.72 g/cm and the minimum specified B₄C density is 0.96 g/cm.

M.6.3 Model Specification

The following subsections describe the physical models and materials of the NUHOMS[®]-32PT DSC as loaded and transferred in the NUHOMS[®] OS197 or OS197H TC used for input to the CSAS25 module of SCALE-4.4 [6-1] to perform the criticality evaluation. The reactivity of canister under storage conditions is bounded by the TC analysis with zero internal moderator density case. The TC analysis with zero internal moderator density case bounds the storage conditions in the HSM because (1) the canister internals are always dry (purged and backfilled with He) while in the HSM, and (2) the TC contains materials such as steel and lead which provide close reflection of fast neutrons back into the fueled basket while the HSM materials (concrete) are much further from the sides of the DSC and thereby tend to reflect thermalized neutrons back to the canister which are absorbed in the canister materials reducing the system reactivity.

M.6.3.1 Description of Calculational Model

The TC and canister are explicitly modeled using the appropriate geometry options in KENO V.a of the CSAS25 module in SCALE-4.4. Several models are developed to evaluate the fabrication tolerances of the canister, basket, fuel clad outer diameter, fuel assembly locations, fuel assembly type, initial enrichments, PRA locations and storage of CCs with the B&W 15x15, WE 17x17, WE 15x15, CE 14x14 and WE 14x14 assembly classes.

The first model is a full active-fuel height and full radial cross section of the canister and TC with reflective boundary conditions on the ends and sides. The model does not explicitly include the water neutron shield. However, the infinite array of TCs without the neutron shield does contain unborated water between the TCs. KENO plots of these models for each assembly class are included in Section M.6.6.2. This model is used to determine the most reactive fuel assembly for a given enrichment and without any PRAs, most reactive assembly-to-assembly pitch, and to determine the most reactive canister configuration accounting for manufacturing tolerances and fuel assembly clad outer diameter tolerances.

All calculations to determine the most reactive configuration are performed utilizing the configurations containing 20 poison plates. There is no change to the most reactive configuration due to a change in the number and orientation of the poison plates in the basket (16 poison plate and 24 poison plate configurations).

The second model is of the most reactive configuration identified above. This model is used to determine the maximum enrichment allowed for each assembly type as a function of the number of PRAs (none, four, eight and sixteen), and boron loading, as appropriate. In addition, the effect of CCs for the B&W 15x15, WE 17x17, WE 15x15, CE 14x14 and WE 14x14 class assemblies for the various configurations are evaluated.

For all assembly classes, the maximum allowed enrichment is determined with 2500 ppm soluble boron concentration in the pool. For the CE 14x14, WE 14x14, and CE 15x15 assembly classes, the maximum allowed enrichment is also determined for a range of boron loadings in the pool (i.e., 1800-2500 ppm) for the 16 poison plate and 24 poison plate configurations.

Figure M.6-5 is a sketch of each KENO V.a unit showing all materials and dimensions for each Unit and an annotated cross section map showing the assembled geometry units in the radial direction of the most reactive configuration identified in this evaluation. The bounding k_{eff} is calculated with a Westinghouse 17x17 LOPAR/Standard assembly with an initial enrichment of 3.4 wt. % U-235, with no PRAs and 32 BPRAs.

Note that BPRAs are the most relevant CCs for criticality considerations and are utilized in the rest of this chapter to cover all CCs.

plate/tube thickness, minimum fuel compartment width, minimum assembly-to-assembly pitch and uniform maximum planar enrichment. The following analysis uses this configuration to determine the maximum allowed initial enrichment as a function of initial enrichment and PRA configuration for each assembly class. All three poison plate configurations (20 poison plate configuration, 16 poison plate configuration and 24 poison plate configuration) are evaluated in these calculations. Calculations at 2500 ppm boron are performed for all assembly classes. For the CE 14x14, WE 14x14, and CE 15x15 assembly classes, calculations are also performed for a range of boron loadings (1800-2500 ppm) for the 16 poison plate and the 24 poison plate configurations. The most reactive assembly type for each assembly class is used for each evaluation. In addition, for each case the internal moderator density is varied to determine the peak reactivity for the specific configuration. The maximum initial enrichment for each assembly class and PRA configuration are provided in Table M.6-1.

The canister/TC model for this evaluation differs from the actual design in the following ways:

- the boron-10 content in the poison plates is 10% lower than the minimum required,
- the boron-10 content in the PRAs is 25% lower than the minimum required,
- the stainless steel/aluminum transition rails that provide support to the fuel compartment grid are modeled as various solid materials to determine the most reactive condition,
- BPRAs, when modeled, are modeled as solid ${}^{11}B_4C$ in the guide tubes and instrument tubes,
- the neutron shield and the skin of the TC are conservatively replaced with water between the TCs, and
- the worst case material conditions, as determined in Section M.6.4.2 above, are modeled.

The input file for the case with the highest calculated reactivity is included in Section M.6.6.4.

WE 17x17 Class Assemblies

The most reactive WE 17x17 class assembly is the WE 17x17 LOPAR/standard assembly as demonstrated in Table M.6-6. The results for the WE 17x17 class assembly calculations for the 20 poison plate configuration are listed in Table M.6-13 and Table M.6-14 for cases without and with BPRAs, respectively. The results for the WE 17x17 class assembly calculations for the 16 poison plate configuration are listed in Table M.6-27 and Table M.6-28 for cases without and with BPRAs, respectively. The results for the WE 17x17 class assembly calculations for the 24 poison plate configuration are listed in Table M.6-29 and Table M.6-30 for cases without and with BPRAs, respectively.

B&W 15x15 Class Assemblies

The most reactive B&W 15x15 class assembly is the B&W 15x15 Mark B assembly as demonstrated in Table M.6-6. The results for the B&W 15x15 class assembly calculations for the 20 poison plate configuration are listed in Table M.6-15 and Table M.6-16 for cases without and with BPRAs, respectively. The results for the B&W 15x15 class assembly calculations for the 16 poison plate configuration are listed in Table M.6-31 and Table M.6-32 for cases without and with BPRAs, respectively. The results for the B&W 15x15 class assembly calculations for the 24 poison plate configuration are listed in Table M.6-33 and Table M.6-34 for cases without and with BPRAs, respectively.

CE 15x15 Class Assemblies

The most reactive CE 15x15 class assembly is the CE 15x15 Palisades assembly as demonstrated in Table M.6-6. The results for the CE 15x15 class assembly calculations for the 20 poison plate configuration are listed in Table M.6-17 for cases without BPRAs. BPRAs are not authorized to be stored with CE 15x15 class assemblies.

The addition of plugging cluster assemblies, i.e., steel rods, into each of the eight guide tubes of a CE 15x15 class assembly reduces the maximum reactivity of the payload. The introduction of the steel rods displaces both moderator and soluble boron within the assemblies. The plugging clusters are assumed to extend approximately 1 inch into the top of the assembly's active fuel region, and the resulting change in the maximum reactivity is less than the statistical uncertainties of the calculations. To demonstrate the affect of displacing the borated water on system reactivity, CE 15x15 Palisades cases with the highest fuel enrichments and highest soluble boron loadings (2300, 2400, and 2500 ppm boron) were reevaluated with steel in the guide tubes. Two scenarios were evaluated: full length steel rods and 1 inch long steel rods. The calculated reactivity of the models are shown in Table M.6-44 and Table M.6-45 (the k_{KENO} and 1σ values in columns 2 and 3 are from Table M.6-17). As shown therein, the addition of plugging clusters reduces reactivity of the system regardless of the length of the plugging cluster. These results also apply to the 16 and 24 poison plate configurations.

The results for the CE 15x15 class assembly calculations for the 16 and 24 poison plate configurations as a function of boron loading are listed in Table M.6-41.

	Soluble) (No PRA Type A	s)	4 P) (Typ	RAs De B)	8 P (Tyj	RAs pe C)	16 Р (Тур	RAs be D)
Assembly Class	Loading (ppm)	Po Coi	ison Pla nfigura	ate tion	Poisor Config	n Plate uration	Poiso Config	n Plate uration	Poison Config	Plate
		16	20	24	20	24	20	24	20	24
WE 17x17 Fuel Assembly ⁽¹⁾	2500	3.40	3.40	3.40	4.00	4.00	4.50	4.50	5.00	5.00
B&W 15x15 Mark B Fuel Assembly ⁽¹⁾	2500	3.30	3.30	3.30	3.90	3.90	NE	NE	5.00	5.00
WE 15x15 Fuel Assembly (without CC)	2500	3.40	3.40	3.40	4.00	4.00	4.60	4.60	5.00	5.00
WE 15x15 Fuel Assembly (with CC)	2500	3.40	3.35	3.40	4.00	4.00	4.55	4.55	5.00	5.00
	1800	3.35	NE	3.50	NE	4.00	NE	4.35	NE	NE
	2000	3.50	NE	3.70	NE	4.20	NE	4.55	NE	NE
	2100	3.60	NE	3.80	NE	4.30	NE	4.70	NE	NE
CE 14x14 Fuel Assembly (without CC)	2200	3.70	NE	3.90	NE	4.40	NE	4.80	NE	NE
	2300	3.75	NE	4.00	NE	4.50	NE	4.90	NE	NE
	2400	3.80	NE	4.05	NE	4.60	NE	5.00	NE	NE
· · · · · · · · · · · · · · · · · · ·	2500	3.90	3.80	4.15	4.60	4.70			NE	NE
	1800	3.30	NE	3.45	NE	3.90	NE	4.25	NE	NE
	2000	3.45	NE	3.65	NE	4.10	NE	4.50	NE	NE
	2100	3.55	NE	3.75	NE	4.20	NE	4.60	NE	NE
CE 14x14 Fuel Assembly (with CC)	2200	3.60	NE	3.80	NE	4.30	NE	4.70	NE	NE
	2300	3.65	NE	3.90	NE	4.40	NE	4.80	NE	NE
	2400	3.80	NE	4.00	NE	4.50	NE	4.90	NE	NE
	2500	3.90	3.70	4.05	4.45	4.60	4.95	5.00	NE	NE
	1800	3.55	NE	3.75	NE	4.40	NE	NE	NE	NE
	2000	3.75	NE	3.90	NÉ	4.60	NE	NE	NE	NE
WE 14x14 Eval Assembly	2100	3.80	NE	4.00	NE	4.75	NE	NE	NE	NE
(with and without CC)	2200	3.90	NE	4.10	NE	4.85	NE	NE	NE	NE
(2300	4.00	NE	4.20	NE	5.00	NE	NE	NE	NE
· · ·	2400	4.10	NE	4.30	NE		NE	NE	NE	NE
	2500	4.15	4.00	4.40	5.00		NE	NE	NE	NE
	1800	3.00	NE	3.15	NE	NE	NE	NE	NE	NE
	2000	3.15	NE	3.30	NE	NE	NE	NE	NE	NE
	2100	3.20	NE	3.40	NE	NE	NE	NE	NE	NE
CE 15x15 Fuel Assembly	2200	3.30	NE	3.50	NE	NE	NE	NE	NE	NE
	2300	3.35	NE	3.55	NE	NE	NE	NE	NE	NE
	2400	3.40	NE	3.60	NE	NE	NE	NE	NE	NE
	2500	3.50	3.40	3.70	NE	NE	NE	NE	NE	NE

Table M.6-1Maximum Initial Enrichment For Each Configuration, wt. % U-235

NOTES:

(1) With or without CCs. CCs shall not be stored in basket location where a PRA is required.

NE - Not Evaluated

 Table M.6-17

 CE 15x15 Class Assembly without BPRAs Results (20 Poison Plate Configuration, Variable Soluble Boron Concentration)

Model Description	k _{keno}	1σ	k _{eff}				
Initial Enrichment 3.4 wt% U-235 - No PRAs, w/o BPRAs							
Internal Moderator at 100%TD	0.9100	0.0009	0.9118				
Internal Moderator at 90%TD	0.9188	0.0009	0.9206				
Internal Moderator at 80%TD	0.9257	0.0009	0.9275				
Internal Moderator at 70%TD	0.9316	0.0011	0.9338				
Internal Moderator at 60%TD	0.9267	0.0009	0.9285				
Internal Moderator at 50%TD	0.9177	0.0010	0.9197				
Internal Moderator at 40%TD	0.8981	0.0009	0.8999				

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Table M.6-18

Model Description	k _{keno}	1σ	k _{eff}
Initial Enrichment 3.4 wt% l	J-235 - No PRAs	, w/o BPRA	s
Internal Moderator at 100%TD	0.9016	0.0009	0.9034
Internal Moderator at 90%TD	0.9149	0.0009	0.9167
Internal Moderator at 80%TD	0.9255	0.0008	0.9271
Internal Moderator at 70%TD	0.9328	0.0009	0.9346
Internal Moderator at 60%TD	0.9364	0.0009	0.9382
Internal Moderator at 50%TD	0.9308	0.0010	0.9328
Internal Moderator at 40%TD	0.9133	0.0008	0.9149
Initial Enrichment 4.0 wt%	U-235 - 4 PRAs,	w/o BPRAs	s .
Internal Moderator at 100%TD	0.9107	0.0009	0.9125
Internal Moderator at 90%TD	0.9229	0.0010	0.9249
Internal Moderator at 80%TD	0.9292	0.0010	0.9312
Internal Moderator at 70%TD	0.9307	0.0009	0.9325
Internal Moderator at 60%TD	0.9278	0.0009	0.9296
Internal Moderator at 50%TD	0.9183	0.0009	0.9201
Internal Moderator at 40%TD	0.8959	0.0008	0.8975
Initial Enrichment 4.6 wt%	U-235 - 8 PRAs,	w/o BPRAs	5
Internal Moderator at 100%TD	0.9276	0.0009	0.9294
Internal Moderator at 90%TD	0.9325	0.0009	0.9343
Internal Moderator at 80%TD	0.9363	0.0010	0.9383
Internal Moderator at 70%TD	0.9349	0.0008	0.9365
Internal Moderator at 60%TD	0.9251	0.0009	0.9269
Internal Moderator at 50%TD	0.9130	0.0009	0.9148
Internal Moderator at 40%TD	0.8863	0.0010	0.8883
Initial Enrichment 5.0 wt% I	U-235 - 16 PRAs	, w/o BPRA	.s
Internal Moderator at 100%TD	0.8969	0.0012 .	0.8993
Internal Moderator at 90%TD	. 0.8985	0.0011	0.9007
Internal Moderator at 80%TD	0.8967	0.0010	0.8987
Internal Moderator at 70%TD	0.8894	0.0009	0.8912
Internal Moderator at 60%TD	0.8780	0.0009	0.8798
Internal Moderator at 50%TD	0.8567	0.0010	0.8587
Internal Moderator at 40%TD	0.8259	0.0009	0.8277

WE 15x15 Class Assembly with and without BPRAs Results (20 Poison Plate Configuration, 2500 ppm Soluble Boron Concentration)

Table M.6-18

WE 15x15 Class Assembly with and without BPRAs Results (20 Poison Plate Configuration, 2500 ppm Soluble Boron Concentration)

Model Descriptio n	k _{keno}	Ισ	k _{eff}			
20-Plate Basket, 3.35 w/o U-235, 2500 ppm, No PRAs, with BPRAs						
MD=40%	0.9016	0.0010	0.9036			
MD=50%	0.9224	0.0009	0.9242			
MD=60%	0.9309	0.0009	0.9327			
MD=70%	0.9335	0.0009	0.9353			
MD=80%	0.9315	0.0009	0.9333			
MD=90%	0.9255	0.0008	0.9271			
MD=100%	0.9157	0.0009	0.9175			
20-Plate Basket, 4.00 w/o U-235, 2500 ppm, 4 PRAs, with BPRAs						
MD=40%	0.8840	0.0009	0.8858			
MD=50%	0.9105	0.0009	0.9123			
MD=60%	0.9245	0.0010	0.9265			
MD=70%	0.9336	0.0009	0.9354			
MD=80%	0.9355	0.0011	0.9377			
MD=90%	0.9330	0.0010	0.9350			
MD=100%	0.9289	0.0009	0.9307			
20-Plate Basket, 4.55 w/o U-235, 2500 ppm, 8 PRAs, with BPRAs						
MD=40%	0.8710	0.0008	0.8726			
MD=50%	0.9003	0.0010	0.9023			
MD=60%	0.9181	0.0010	0.9201			
MD=70%	0.9309	0.0009	0.9327			
MD=80%	0.9362	0.0009	0.9380			
MD=90%	0.9364	0.0009	0.9382			
MD=100%	0.9337	0.0009	0.9355			



Table M.6-19

CE 14x14 Class Assembly with and	without BPRAs at 2500 ppm Soluble Boron
Concentration Results	(20 Poison Plate Configuration)

Model Description	k _{keno}	1σ	k _{eff}			
Initial Enrichment 3.8 wt% U-235 - No PRAs, w/o BPRAs						
Internal Moderator at 100%TD	0.8905	0.0011	0.8927			
Internal Moderator at 90%TD	0.9078	0.0012	0.9102			
Internal Moderator at 80%TD	0.9196	0.0009	0.9214			
Internal Moderator at 70%TD	0.9292	0.0009	0.9310			
Internal Moderator at 60%TD	0.9347	0.0010	0.9367			
Internal Moderator at 50%TD	0.9309	0.0010	0.9329			
Internal Moderator at 40%TD	0.9165	0.0010	0.9185			
Initial Enrichment 4.6 wt% U-235 - 4 PRAs, w/o BPRAs						
Internal Moderator at 100%TD	0.9103	0.0009	0.9121			
Internal Moderator at 90%TD	0.9223	0.0009	0.9241			
Internal Moderator at 80%TD	0.9300	0.0010	0.9320			
Internal Moderator at 70%TD	0.9371	0.0008	0.9387			
Internal Moderator at 60%TD	0.9376	0.0008	0.9392			
Internal Moderator at 50%TD	0.9308	0.0009	0.9326			
Internal Moderator at 40%TD	0.9155	0.0010	0.9175			
Initial Enrichment 5.0 wt% U-235 - 8 PRAs, w/o BPRAs						
Internal Moderator at 100%TD	0.9133	0.0009	0.9151			
Internal Moderator at 90%TD	0.9199	0.0010	0.9219			
Internal Moderator at 80%TD	0.9271	0.0011	0.9293			
Internal Moderator at 70%TD	0.9294	0.0009	0.9312			
Internal Moderator at 60%TD	0.9271	0.0008	0.9287			
Internal Moderator at 50%TD	0.9181	0.0010	0.9201			
Internal Moderator at 40%TD	0.8976	0.0009	0.8994			
CE 14x14 Class Assembly with and without BPRAs at 2500 ppm Soluble Boron Concentration Results (20 Poison Plate Configuration)

Model Description	k _{keno}	1σ	k _{eff}	
20-Plate Basket, 3.70 w/o U-235, 2500 ppm, No PRAs				
MD=40%	0.9001	0.0010	0.9021	
MD=50%	0.9215	0.0011	0.9237	
MD=60%	0.9320	0.0010	0.9340	
MD=70%	0.9357	0.0010	0.9377	
MD=80%	0.9339	0.0010	0.9359	
MD=90%	0.9272	0.0008	0.9288	
MD=100%	0.9183	0.0009	0.9201	
20-Plate Basket,	4.45 w/o U-23	5, 2500 ppm, 4	4 PRAs	
MD=40%	0.8947	0.0010	0.8967	
MD=50%	0.9174	0.0009	0.9192	
MD=60%	0.9320	0.0008	0.9336	
MD=70%	0.9360	0.0009	0.9378	
MD=80%	0.9374	0.0010	0.9394	
MD=90%	0.9334	0.0008	0.9350	
MD=100%	0.9284	0.0010	0.9304	
20-Plate Basket,	4.95 w/o U-23	5, 2500 ppm, 8	3 PRAs	
MD=40%	0.8834	0.0008	0.8850	
MD=50%	0.9096	0.0009	0.9114	
MD=60%	0.9259	0.0010	0.9279	
MD=70%	0.9318	0.0009	0.9336	
MD=80%	0.9355	0.0009	0.9373	
MD=90%	0.9350	0.0010	0.9370	
MD=100%	0.9314	0.0009	0.9332	

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WE 14x14 Class Assembly with and without BPRAs at 2500 ppm Soluble Boron Concentration Results (20 Poison Plate Configuration)

Model Description	k _{keno}	1σ	k _{eff}	
Initial Enrichment 4.0 wt% U-235 – No PRAs, w/o BPR				
Internal Moderator at 100%TD	0.9030	0.0011	0.9052	
Internal Moderator at 90%TD	0.9148	0.0009	0.9166	
Internal Moderator at 80%TD	0.9257	0.0010	0.9277	
Internal Moderator at 70%TD	0.9335	0.0011	0.9357	
Internal Moderator at 60%TD	0.9374	0.0010	0.9394	
Internal Moderator at 50%TD	0.9343	0.0009	0.9361	
Internal Moderator at 40%TD	0.9225	0.0010	0.9245	
20-Plate Basket, 4.00 w/o U	-235, 250	0 ppm, No	PRAs	
MD=40%	0.9157	0.0010	0.9177	
MD=50%	0.9293	0.0010	0.9313	
MD=60%	0.9354	0.0013	0.9380	
MD=70%	0.9359	0.0011	0.9381	
MD=80%	0.9330	0.0011	0.9352	
MD=90%	0.9256	0.0010	0.9276	
MD=100%	0.9196	0.0011	0.9218	
Initial Enrichment 5.0 wt%	U-235 - 4 P	'RAs, w/o I	BPRAs	
Internal Moderator at 100%TD	0.9098	0.0009	0.9116	
Internal Moderator at 90%TD	0.9189	0.0008	0.9205	
Internal Moderator at 80%TD	0.9285	0.0009	0.9303	
Internal Moderator at 70%TD	0.9348	0.0009	0.9366	
Internal Moderator at 60%TD	0.9364	0.0010	0.9384	
Internal Moderator at 50%TD	0.9325	0.0010	0.9345	
Internal Moderator at 40%TD	0.9185	0.0010	0.9205	
20-Plate Basket, 5.00 w/o l	U-235, 25(00 ppm, 4	PRAs	
MD=40%	0.9089	0.0009	0.9107	
MD=50%	0.9238	0.0012	0.9262	
MD=60%	0.9298	0.0010	0.9318	
MD=70%	0.9310	0.0009	0.9328	
MD=80%	0.9280	0.0009	0.9298	
MD=90%	0.9237	0.0009	0.9255	
MD=100%	0.9165	0.0009	0.9183	



Results for the WE 15x15 Class Fuel Assembly with and without BPRAs (16 Poison Plate Configuration, 2500 ppm Soluble Boron Concentration)

Model Description	k _{keno}	1σ	k _{eff}			
Initial E	Initial Enrichment 3.4 w/o U-235, No BPRAs					
MD=40%	0.9129	0.0009	0.9147			
MD=50%	0.9280	0.0010	0.9300			
MD=55%	0.9320	0.0010	0.9340			
MD=60%	0.9316	0.0008	0.9332			
MD=65%	0.9321	0.0010	0.9341			
MD=70%	0.9287	0.0008	0.9303			
MD=75%	0.9257	0.0009	0.9275			
MD=80%	0.9198	0.0008	0.9214			
MD=85%	0.9158	0.0008	0.9174			
MD=90%	0.9074	0.0008	0.9090			
MD=95%	0.9008	0.0009	0.9026			
MD=100%	0.8948	0.0009	0.8966			
16-Plate Bask	16-Plate Basket, 3.40 w/o U-235, 2500 ppm, No PRAs,					
	with B	SPRAS				
MD=40%	0.9039	0.0009	0.9057			
MD=50%	0.9236	0.0009	0.9254			
MD=60%	0.9317	0.0009	0.9335			
MD=70%	0.9343	0.0008	0.9359			
MD=80%	0.9309	0.0008	0.9325			
MD=90%	0.9237	0.0008	0.9253			
MD=100%	0.9136	0.0009	0.9154			

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Model Description	k _{keno}	1σ	k _{eff}
Initial Enrichment	3.4 w/o U-235	, No BPRAs, I	No PRAs
MD=40%	0.8847	0.0008	0.8863
MD=50%	0.9035	0.0009	0.9053
MD=60%	0.9106	0.0008	0.9122
MD=70%	0.9096	0.0008	0.9112
MD=80%	0.9040	0.0009	0.9058
MD=90%	0.8949	0.0008	0.8965
MD=100%	0.8805	0.0008	0.8821
Initial Enrichmen	t 4.0 w/o U-23	5, No BPRAs,	4 PRAs
MD=40%	0.8803	0.0009	0.8821
MD=50%	0.9049	0.0008	0.9065
MD=60%	0.9194	0.0008	0.9210
MD=70%	0.9234	0.0008	0.9250
MD=80%	0.9224	0.0010	0.9244
MD=90%	0.9174	0.0010	0.9194
MD=100%	0.9092	0.0009	0.9110
Initial Enrichmen	t 4.6 w/o U-23	5, No BPRAs,	8 PRAs
MD=40%	0.8756	0.0008	0.8772
MD=50%	0.9022	0.0010	0.9042
MD=60%	0.9234	0.0009	0.9252
MD=70%	0.9321	0.0009	0.9339
MD=80%	0.9352	0.0010	0.9372
MD=90%	0.9327	0.0009	0.9345
MD=100%	0.9270	0.0011	0.9292
Initial Enrichment	5.0 w/o U-235	5, No BPRAs, 1	16 PRAs
MD=40%	0.8161	0.0008	0.8177
MD=50%	0.8525	0.0010	0.8545
MD=60%	0.8754	0.0010	0.8774
MD=70%	0.8927	0.0010	0.8947
MD=80%	0.9008	0.0010	0.9028
MD=90%	0.9056	0.0012	0.9080
MD=100%	0.9046	0.0012	0.9070
24-Plate Basket, 4.55	5 w/o U-235, 2	2500 ppm, 8 🛛	PRAs, with
	BPRAs		
MD=40%	0.8608	0.0009	0.8626
MD=50%	0.8940	0.0010	0.8960
MD=60%	0.9136	0.0010	0.9156
MD=70%	0.9279	0.0009	0.9297
MD=80%	0.9352	0.0010	0.9372
MD=90%	0.9378	0.0010	0.9398
MD=100%	0.9349	0.0009	0.9367

Results for the WE 15x15 Class Fuel Assembly with and without BPRAs (24 Poison Plate Configuration, 2500 ppm Soluble Boron Concentration)



CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Model Description	k _{keno}	1σ	k _{eff}		
CE 14x14 Fort Calhoun, 1800 ppm boron, 16 Poison plates, 3.35					
wt% U-2	235, No PRAs	, no BPRAs	_		
MD = 40%	0.9051	0.0008	0.9067		
MD = 50%	0.9254	0.0009	0.9272		
MD = 55%	0.9313	0.0008	0.9329		
MD = 60%	0.9349	0.0009	0.9367		
MD = 65%	0.9343	0.0011	0.9365		
$\mathbf{MD} = 70\%$	0.9352	0.0009	0.9370		
MD = 75%	0.9329	0.0008	0.9345		
MD = 80%	0.9294	0.0008	0.9310		
MD = 90%	0.9201	0.0009	0.9219		
MD = 100%	0.9074	0.0008	0.9090		
CE 14x14 Fort Calhoun	, 1800 ppm bo	oron, 24 Poiso	n plates, 3.50		
wt% U-2	235, No PRAs	, no BPRAs	_		
MD = 40%	0.8944	0.0008	0.8960		
MD = 50%	0.9183	0.0009	0.9201		
MD = 55%	0.9227	0.0009	0.9245		
MD = 60%	0.9280	0.0010	0.9300		
MD = 65%	0.9312	0.0008	0.9328		
$\mathbf{MD} = 70\%$	0.9316	0.0010	0.9336		
MD = 80%	0.9285	0.0009	0.9303		
MD = 90%	0.9219	0.0012	0.9243		
MD = 100%	0.9119	0.0009	0.9137		
CE 14x14 Fort Calhoun	i, 1800 ppm bo	oron, 24 Poiso	n plates, 4.00		
wt% U-	235, 04 PRAs,	no BPRAs			
MD = 40%	0.8890	0.0010	0.8910		
MD = 50%	0.9144	0.0009	0.9162		
MD = 60%	0.9295	0.0010	0.9315		
MD = 65%	0.9339	0.0011	0.9361		
$\mathbf{MD} = \mathbf{70\%}$	0.9359	0.0009	0.9377		
MD = 75%	0.9342	0.0009	0.9360		
MD = 80%	0.9347	0.0009	0.9365		
MD = 90%	0.9305	0.0008	0.9321		
MD = 100%	0.9227	0.0010	0.9247		

CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

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Model Description	k _{keno}	1σ	k _{eff}		
CE 14x14 Fort Calhoun, 1800 ppm boron, 24 Poison plates, 4.35					
wt% U-	235, 08 PRAs	, no BPRAs	- /		
MD = 40%	0.8761	0.0009	0.8779		
MD = 50%	0.9037	0.0010	0.9057		
MD = 60%	0.9213	0.0009	0.9231		
MD = 70%	0.9323	0.0010	0.9343		
MD = 75%	0.9338	0.0009	0.9356		
MD = 80%	0.9329	0.0009	0.9347		
MD = 85%	0.9331	0.0011	0.9353		
MD = 90%	0.9310	0.0010	0.9330		
MD = 100%	0.9292	0.0010	0.9312		
CE 14x14 Fort Calhour	n, 2000 ppm be	oron, 16 Poiso	n plates, 3.50		
wt% U-	235, No PRAs	, no BPRAs			
MD = 40%	0.9055	0.0009	0.9073		
MD = 50%	0.9275	0.0009	0.9293		
MD = 55%	0.9315	0.0009	0.9333		
MD = 60%	0.9329	0.0009	0.9347		
MD = 65%	0.9335	0.0008	0.9351		
MD = 70%	0.9315	0.0010	0.9335		
MD = 75%	0.9290	0.0009	0.9308		
MD = 80%	0.9258	0.0008	0.9274		
MD = 90%	0.9152	0.0009	0.9170		
MD = 100%	0.8999	0.0010	0.9019		
CE 14x14 Fort Calhour	1, 2000 ppm be	oron, 24 Poiso	n plates, 3.70		
wt% U-	235, No PRAs	, no BPRAs			
MD = 40%	0.9011	0.0010	0.9031		
MD = 50%	0.9201	0.0010	0.9221		
MD = 55%	0.9277	0.0011	0.9299		
MD = 60%	0.9310	0.0009	0.9328		
MD = 65%	0.9340	0.0010	0.9360		
$\mathbf{MD} = 70\%$	0.9342	0.0010	0.9362		
MD = 80%	0.9284	0.0008	0.9300		
MD = 90%	0.9200	0.0010	0.9220		
MD = 100%	0.9079	0.0010	0.9099		

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CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Model Description	k _{keno}	1σ	k _{eff}
CE 14x14 Fort Calhour	n, 2000 ppm be	oron, 24 Poiso	n plates, 4.20
wt% U-	235, 04 PRAs,	no BPRAs	
MD = 40%	0.8944	0.0009	0.8962
MD = 50%	0.9167	0.0010	0.9187
MD = 60%	0.9286	0.0010	0.9306
MD = 65%	0.9347	0.0010	0.9367
MD = 70%	0.9353	0.0010	0.9373
MD = 75%	0.9362	0.0009	0.9380
MD = 80%	0.9337	0.0009	0.9355
MD = 90%	0.9270	0.0008	0.9286
MD = 100%	0.9198	0.0010	0.9218
CE 14x14 Fort Calhour	n, 2000 ppm bo	oron, 24 Poiso	n plates, 4.55
wt% U-	235, 08 PRAs,	no BPRAs	
MD = 40%	0.8819	0.0009	0.8837
MD = 50%	0.9065	0.0009	0.9083
MD = 60%	0.9219	0.0009	0.9237
MD = 70%	0.9301	0.0010	0.9321
MD = 75%	0.9319	0.0009	0.9337
MD = 80%	0.9313	0.0010	0.9333
MD = 85%	0.9315	0.0009	0.9333
MD = 90%	0.9300	0.0009	0.9318
MD = 100%	0.9228	0.0009	0.9246
CE 14x14 Fort Calhour	n, 2100 ppm bo	oron, 16 Poiso	n plates, 3.60
wt% U-	235, No PRAs	, no BPRAs	
MD = 40%	0.9107	0.0010	0.9127
MD = 50%	0.9287	0.0008	0.9303
MD = 55%	0.9322	0.0008	0.9338
$\mathbf{MD} = 60\%$	0.9348	0.0010	0.9368
MD = 65%	0.9344	0.0010	0.9364
MD = 70%	0.9320	0.0009	0.9338
MD = 75%	0.9285	0.0009	0.9303
MD = 80%	0.9241	0.0009	0.9259
MD = 90%	0.9130	0.0009	0.9148
MD = 100%	0.8995	0.0009	0.9013

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CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Model Description	k _{KENO}	1σ	k _{eff}		
CE 14x14 Fort Calhoun, 2100 ppm boron, 24 Poison plates, 3.80					
wt% U-	235, No PRAs	, no BPRAs			
MD = 40%	0.9051	0.0009	0.9069		
MD = 50%	0.9262	0.0008	0.9278		
MD = 55%	0.9305	0.0010	0.9325		
MD = 60%	0.9346	0.0009	0.9364		
MD = 65%	0.9336	0.0010	0.9356		
MD = 70%	0.9329	0.0009	0.9347		
MD = 80%	0.9271	0.0009	0.9289		
MD = 90%	0.9185	0.0009	0.9203		
MD = 100%	0.9083	0.0009	0.9101		
CE 14x14 Fort Calhour	n, 2100 ppm bo	oron, 24 Poiso	n plates, 4.30		
wt% U-	235, 04 PRAs,	no BPRAs	_		
MD = 40%	0.8977	0.0009	0.8995		
MD = 50%	0.9202	0.0011	0.9224		
MD = 60%	0.9292	0.0009	0.9310		
MD = 65%	0.9350	0.0010	0.9370		
$\mathbf{MD} = 70\%$	0.9355	0.0010	0.9375		
MD = 75%	0.9342	0.0009	0.9360		
MD = 80%	0.9311	0.0009	0.9329		
MD = 90%	0.9269	0.0011	0.9291		
MD = 100%	0.9170	0.0009	0.9188		
CE 14x14 Fort Calhour	1, 2100 ppm bo	oron, 24 Poiso	n plates, 4.70		
wt% U-	235, 08 PRAs,	no BPRAs			
MD = 40%	0.8863	0.0009	0.8881		
MD = 50%	0.9114	0.0009	0.9132		
MD = 60%	0.9268	0.0010	0.9288		
MD = 70%	0.9322	0.0009	0.9340		
MD = 75%	0.9328	0.0009	0.9346		
MD = 80%	0.9327	0.0010	0.9347		
MD = 85%	0.9316	0.0010	0.9336		
MD = 90%	0.9301	0.0010	0.9321		
MD = 100%	0.9228	0.0012	0.9252		

(continued)



CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Model Description	k _{keno}	1σ	k _{eff}
CE 14x14 Fort Calhour	1, 2200 ppm be	oron, 16 Poiso	n plates, 3.70
<u>wt% U-</u>	235, No PRAs	, no BPRAs	
MD = 40%	0.9126	0.0009	0.9144
MD = 50%	0.9305	0.0009	0.9323
MD = 55%	0.9330	0.0009	0.9348
$\mathbf{MD} = \mathbf{60\%}$	0.9357	0.0010	0.9377
MD = 65%	0.9346	0.0010	0.9366
MD = 70%	0.9330	0.0009	0.9348
MD = 75%	0.9298	0.0009	0.9316
MD = 80%	0.9246	0.0009	0.9264
MD = 90%	0.9131	0.0009	0.9149
MD = 100%	0.8991	0.0009	0.9009
CE 14x14 Fort Calhour	n, 2200 ppm be	oron, 24 Poiso	n plates, 3.90
wt% U-	235, No PRAs	, no BPRAs	
MD = 40%	0.9064	0.0009	0.9082
MD = 50%	0.9269	0.0009	0.9287
MD = 55%	0.9334	0.0008	0.9350
MD = 60%	0.9341	0.0009	0.9359
MD = 65%	0.9357	0.0010	0.9377
MD = 70%	0.9356	0.0009	0.9374
MD = 80%	0.9294	0.0010	0.9314
MD = 90%	0.9197	0.0009	0.9215
MD = 100%	0.9050	0.0009	0.9068
CE 14x14 Fort Calhour	1, 2200 ppm be	oron, 24 Poiso	n plates, 4.40
wt% U-	235, 04 PRAs,	no BPRAs	
MD = 40%	0.8993	0.0009	0.9011
MD = 50%	0.9196	0.0009	0.9214
MD = 60%	0.9319	0.0009	0.9337
MD = 65%	0.9356	0.0009	0.9374
MD = 70%	0.9340	0.0009	0.9358
MD = 75%	0.9316	0.0009	0.9334
MD = 80%	0.9314	0.0009	0.9332
MD = 90%	0.9236	0.0010	0.9256
MD = 100%	0.9163	0.0011	0.9185

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CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

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Model Description	k _{keno}	1σ	$\mathbf{k}_{\mathrm{eff}}$		
CE 14x14 Fort Calhour	n, 2200 ppm b	oron, 24 Poiso	n plates, 4.80		
wt% U-235, 08 PRAs, no BPRAs					
MD = 40%	0.8875	0.0009	0.8893		
MD = 50%	0.9123	0.0010	0.9143		
MD = 60%	0.9262	0.0010	0.9282		
MD = 65%	0.9294	0.0009	0.9312		
$\mathbf{MD} = 70\%$	0.9326	0.0010	0.9346		
MD = 75%	0.9318	0.0010	0.9338		
MD = 80%	0.9316	0.0009	0.9334		
MD = 85%	0.9316	0.0010	0.9336		
MD = 90%	0.9284	0.0011	0.9306		
MD = 100%	0.9213	0.0009	0.9231		
CE 14x14 Fort Calhour	n, 2300 ppm b	oron, 16 Poiso	n plates, 3.75		
wt% U-	235, No PRAs	, no BPRAs	• ·		
MD = 40%	0.9120	0.0009	0.9138		
MD = 50%	0.9296	0.0008	0.9312		
MD = 55%	0.9330	0.0008	0.9346		
MD = 60%	0.9350	0.0010	0.9370		
MD = 65%	0.9328	0.0009	0.9346		
MD = 70%	0.9289	0.0009	0.9307		
MD = 75%	0.9265	0.0009	0.9283		
MD = 80%	0.9202	0.0010	0.9222		
MD = 90%	0.9094	0.0009	0.9112		
MD = 100%	0.8927	0.0009	0.8945		
CE 14x14 Fort Calhour	a, 2300 ppm b	oron, 24 Poiso	n plates, 4.00		
wt% U-	235, No PRAs	, no BPRAs	• •		
MD = 40%	0.9112	0.0009	0.9130		
MD = 50%	0.9296	0.0008	0.9312		
MD = 55%	0.9330	0.0008	0.9346		
MD = 60%	0.9352	0.0009	0.9370		
MD = 65%	0.9358	0.0010	0.9378		
MD = 70%	0.9349	0.0009	0.9367		
MD = 80%	0.9270	0.0010	0.9290		
MD = 90%	0.9182	0.0009	0.9200		
MD = 100%	0.9071	0.0010	0.9091		

(continued)



CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Model Description	k _{KENO}	1σ	k _{eff}
CE 14x14 Fort Calhoun	i, 2300 ppm b	oron, 24 Poiso	n plates, 4.50
wt% U-	235, 04 PRAs	, no BPRAs	
MD = 40%	0.9008	0.0009	0.9026
MD = 50%	0.9227	0.0009	0.9245
MD = 60%	0.9325	0.0009	0.9343
MD = 65%	0.9340	0.0008	0.9356
$\mathbf{MD} = 70\%$	0.9343	0.0010	0.9363
MD = 75%	0.9332	0.0009	0.9350
MD = 80%	0.9308	0.0010	0.9328
MD = 90%	0.9242	0.0009	0.9260
MD = 100%	0.9139	0.0009	0.9157
CE 14x14 Fort Calhoun	, 2300 ppm b	oron, 24 Poiso	n plates, 4.90
wt% U-	235, 08 PRAs	, no BPRAs	-
MD = 40%	0.8906	0.0008	0.8922
MD = 50%	0.9113	0.0010	0.9133
MD = 60%	0.9265	0.0009	0.9283
MD = 65%	0.9310	0.0011	0.9332
$\mathbf{MD} = 70\%$	0.9329	0.0009	0.9347
MD = 75%	0.9323	0.0009	0.9341
MD = 80%	0.9313	0.0009	0.9331
MD = 85%	0.9293	0.0009	0.9311
MD = 90%	0.9279	0.0012	0.9303
MD = 100%	0.9183	0.0010	0.9203
CE 14x14 Fort Calhoun	, 2400 ppm b	oron, 16 Poiso	n plates, 3.80
wt% U-2	235, No PRAs	, no BPRAs	-
MD = 40%	0.9110	0.0009	0.9128
MD = 50%	0.9280	0.0008	0.9296
MD = 55%	0.9315	0.0009	0.9333
MD = 60%	0.9310	0.0009	0.9328
MD = 65%	0.9302	0.0011	0.9324
MD = 70%	0.9278	0.0009	0.9296
MD = 75%	0.9215	0.0008	0.9231
MD = 80%	0.9184	0.0010	0.9204
MD = 90%	0.9047	0.0009	0.9065
MD = 100%	0.8896	0.0009	0.8914

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CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

	,	· · · · ·	
Model Description	k _{keno}	1σ	k _{eff}
CE 14x14 Fort Calhour	n, 2400 ppm b	oron, 24 Poiso	n plates, 4.05
wt% U-	235, No PRAs	, no BPRAs	-
MD = 40%	0.9112	0.0010	0.9132
MD = 50%	0.9276	0.0010	0.9296
MD = 55%	0.9319	0.0010	0.9339
MD = 60%	0.9326	0.0010	0.9346
MD = 65%	0.9335	0.0009	0.9353
MD = 70%	0.9306	0.0009	0.9324
MD = 80%	0.9242	0.0010	0.9262
MD = 90%	0.9136	0.0009	0.9154
MD = 100%	0.8999	0.0009	0.9017
CE 14x14 Fort Calhour	n, 2400 ppm b	oron, 24 Poiso	n plates, 4.60
wt% U-	-235, 04 PRAs	, no BPRAs	-
MD = 40%	0.9035	0.0009	0.9053
MD = 50%	0.9241	0.0009	0.9259
MD = 60%	0.9323	0.0010	0.9343
MD = 65%	0.9349	0.0009	0.9367
$\mathbf{MD} = 70\%$	0.9355	0.0010	0.9375
MD = 75%	0.9352	0.0009	0.9370
MD = 80%	0.9297	0.0009	0.9315
MD = 90%	0.9234	0.0009	0.9252
MD = 100%	0.9116	0.0008	0.9132
CE 14x14 Fort Calhour	n, 2400 ppm be	oron, 24 Poiso	n plates, 5.00
wt% U-	-235, 08 PRAs	, no BPRAs	
MD = 40%	0.8911	0.0010	0.8931
MD = 50%	0.9143	0.0009	0.9161
MD = 60%	0.9260	0.0009	0.9278
MD = 65%	0.9283	0.0010	0.9303
$\mathbf{MD} = 70\%$	0.9315	0.0011	0.9337
MD = 75%	0.9301	0.0010	0.9321
MD = 80%	0.9305	0.0009	0.9323
MD = 85%	0.9293	0.0010	0.9313
MD = 90%	0.9247	0.0010	0.9267
MD = 100%	0.9176	0.0010	0.9196

(continued)



CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

		·	
Model Description	k _{keno}	1σ	k _{eff}
CE 14x14 Fort Calhou	n, 2500 ppm be	oron, 16 Poiso	n plates, 3.90
wt% U-	235, No PRAs	, no BPRAs	
MD = 40%	0.9141	0.0008	0.9157
MD = 50%	0.9289	0.0009	0.9307
MD = 55%	0.9321	0.0010	0.9341
MD = 60%	0.9315	0.0009	0.9333
MD = 65%	0.9308	0.0010	0.9328
MD = 70%	0.9272	0.0009	0.9290
MD = 80%	0.9162	0.0008	0.9178
MD = 90%	0.9051	0.0008	0.9067
MD = 100%	0.8893	0.0008	0.8909
CE 14x14 Fort Calhou	n, 2500 ppm be	oron, 24 Poiso	n plates, 4.15
wt% U-	235, No PRAs	, no BPRAs	
MD = 40%	0.9133	0.0009	0.9151
MD = 50%	0.9302	0.0009	0.9320
MD = 55%	0.9333	0.0009	0.9351
MD = 60%	0.9338	0.0010	0.9358
MD = 65%	0.9336	0.0011	0.9358
MD = 70%	0.9338	0.0010	0.9358
MD = 80%	0.9247	0.0009	0.9265
MD = 90%	0.9131	0.0008	0.9147
MD = 100%	0.9001	0.0009	0.9019
CE 14x14 Fort Calhour	n, 2500 ppm be	oron, 24 Poiso	n plates, 4.70
wt% U-	-235, 04 PRAs,	, no BPRAs	
MD = 40%	0.9075	0.0009	0.9093
MD = 50%	0.9245	0.0010	0.9265
MD = 60%	0.9335	0.0010	0.9355
$\mathbf{MD} = \mathbf{65\%}$	0.9347	0.0009	0.9365
MD = 70%	0.9346	0.0008	0.9362
MD = 75%	0.9320	0.0008	0.9336
MD = 80%	0.9287	0.0010	0.9307
MD = 90%	0.9226	0.0009	0.9244
MD = 100%	0.9098	0.0009	0.9116

(continued)



CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Model Description	k _{keno}	1σ	k _{eff}		
16-Plate Basket.	3.30 w/o U-2.	35. 1800 ppm.	No PRAs. no		
,	BPRAs				
MD=40%	0.8897	0.0009	0.8915		
MD=50%	0.9161	0.0010	0.9181		
MD=60%	0.9296	0.0008	0.9312		
MD=70%	0.9356	0.0010	0.9376		
MD=80%	0.9377	0.0008	0.9393		
MD=90%	0.9328	0.0009	0.9346		
MD=100%	0.9258	0.0010	0.9278		
24-Plate Baske	et, 3.45 w/o U-	235, 1800 ppm	, No PRAs,		
	with BI	PRAs			
MD=40%	0.8790	0.0010	0.8810		
MD=50%	0.9086	0.0011	0.9108		
MD=60%	0.9237	0.0010	0.9257		
MD=70%	0.9316	0.0009	0.9334		
MD=80%	0.9345	0.0009	0.9363		
MD=90%	0.9349	0.0010	0.9369		
MD=100%	0.9319	0.0008	0.9335		
24-Plate Basket,	3.90 w/o U-23	35, 1800 ppm,	4 PRAs, with		
,	BPR	As	,		
MD=40%	0.8714	0.0011	0.8736		
MD=50%	0.8992	0.0010	0.9012		
MD=60%	0.9207	0.0009	0.9225		
MD=70%	0.9292	0.0010	0.9312		
MD=80%	0.9361	0.0009	0.9379		
MD=90%	0.9372	0.0009	0.9390		
MD=100%	0.9345	0.0009	0.9363		
24-Plate Basket,	4.25 w/o U-23	35, 1800 ppm,	8 PRAs, with		
	BPR	As			
MD=40%	0.8581	0.0009	0.8599		
MD=50%	0.8903	0.0010	0.8923		
MD=60%	0.9118	0.0009	0.9136		
MD=70%	0.9263	0.0009	0.9281		
MD=80%	0.9341	0.0010	0.9361		
MD=90%	0.9378	0.0010	0.9398		
MD=100%	0.9377	0.0011	0.9399		

(continued)



CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Model Description	k _{keno}	1σ	k _{eff}		
16-Plate Baske	et, 3.45 w/o U-	- 235, 2000 ppm	, No PRAs,		
	with BF	PRAs			
MD=40%	0.8931	0.0009	0.8949		
MD=50%	0.9177	0.0008	0.9193		
MD=60%	0.9314	0.0009	0.9332		
MD=70%	0.9352	0.0010	0.9372		
MD=80%	0.9353	0.0009	0.9371		
MD=90%	0.9305	0.0009	0.9323		
MD=100%	0.9218	0.0009	0.9236		
24-Plate Baske	et, 3.65 w/o U-	235, 2000 ppm	, No PRAs,		
	with BF	PRAs			
MD=40%	0.8891	0.0010	0.8911		
MD=50%	0.9117	0.0008	0.9133		
MD=60%	0.9283	0.0009	0.9301		
MD=70%	0.9360	0.0009	0.9378		
MD=80%	0.9364	0.0010	0.9384		
MD=90%	0.9348	0.0009	0.9366		
MD=100%	0.9303	0.0010	0.9323		
24-Plate Basket,	24-Plate Basket, 4.10 w/o U-235, 2000 npm, 4 PRAs, with				
	BPR	As	,		
MD=40%	0.8752	0.0009	0.8770		
MD=50%	0.9026	0.0009	0.9044		
MD=60%	0.9234	0.0010	0.9254		
MD=70%	0.9333	0.0008	0.9349		
MD=80%	0.9382	0.0009	0.9400		
MD=90%	0.9357	0.0009	0.9375		
MD=100%	0.9335	0.0009	0.9353		
24-Plate Basket,	4.50 w/o U-23	35, 2000 ppm,	8 PRAs, with		
	BPR	As			
MD=40%	0.8678	0.0009	0.8696		
MD=50%	0.8974	0.0011	0.8996		
MD=60%	0.9174	0.0010	0.9194		
MD=70%	0.9280	0.0011	0.9302		
MD=80%	0.9361	0.0010	0.9381		
MD=90%	0.9381	0.0009	0.9399		
MD=100%	0.9358	0.0010	0.9378		

(continued)



CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Model	k _{keno}	1σ	k _{eff}		
		225 2100			
16-Plate Bask	et, 3.33 W/O U with BP	235, 2100 ppm PRAs	I, NO PKAS,		
) (D 400/			0.007		
MD=40%	0.8977	0.0010	0.8997		
MD=50%	0.9218	0.0009	0.9236		
MD=60%	0.9324	0.0008	0.9340		
MD=70%	0.9383	0.0008	0.9399		
MD=80%	0.9360	0.0008	0.9376		
MD=90%	0.9298	0.0009	0.9316		
MD=100%	0.9203	0.0010	0.9223		
24-Plate Bask	et, 3.75 w/o U-2	235, 2100 ppm	i, No PRAs,		
	with BP	'RAs			
MD=40%	0.8911	0.0009	0.8929		
MD=50%	0.9178	0.0009	0.9196		
MD=60%	0.9310	0.0009	0.9328		
MD=70%	0.9364	0.0008	0.9380		
MD=80%	0.9374	0.0009	0.9392		
MD=90%	0.9338	0.0011	0.9360		
MD=100%	0.9297	0.0011	0.9319		
24-Plate Basket, 4.20 w/o U-235, 2100 nnm, 4 PRAs, with					
	BPR	As	·		
MD=40%	0.8796	0.0009	0.8814		
MD=50%	0.9067	0.0009	0.9085		
MD=60%	0.9229	0.0010	0.9249		
MD=70%	0.9329	0.0011	0.9351		
MD=80%	0.9353	0.0010	0.9373		
MD=90%	0.9347	0.0010	0.9367		
MD=100%	0.9330	0.0009	0.9348		
24-Plate Basket	4 60 w/o U-23	5 2100 ppm	8 PRAs with		
24-1 late Dasket	BPR	As	o i KAS, with		
MD=40%	0.8683	0.0008	0.8699		
MD=50%	0.8994	0.0009	0.9012		
MD=60%	0.9189	0.0010	0.9209		
MD=70%	0.9296	0.0009	0.9314		
MD=80%	0.9358	0.0010	0.9378		
MD=90%	0.9378	0.0011	0.9400		
MD=100%	0.9339	0.0010	0.9359		

(continued)



CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Model	k _{keno}	1σ	k _{eff}
16-Plate Baska	1 26 3 60 w/o U_	235. 2200 ppm	
10-1 late Daske	with BF	233, 2200 ppm PRAs	, INU I INAS,
MD=40%	0.8950	0.0009	0.8968
MD=50%	0.9198	0.0009	0.9216
MD=60%	0.9317	0.0010	0.9337
MD=70%	0.9349	0.0009	0.9367
MD=80%	0.9342	0.0011	0.9364
MD=90%	0.9258	0.0008	0.9274
MD=100%	0.9177	0.0010	0.9197
24-Plate Baske	et, 3.80 w/o U-	235, 2200 ppm	, No PRAs,
	with BF	'RAs	
MD=40%	0.8916	0.0010	0.8936
MD=50%	0.9153	0.0010	0.9173
MD=60%	0.9292	0.0010	0.9312
MD=70%	0.9333	0.0010	0.9353
MD=80%	0.9357	0.0010	0.9377
MD=90%	0.9315	0.0010	0.9335
MD=100%	0.9277	0.0009	0.9295
24-Plate Basket,	4.30 w/o U-23	85, 2200 ppm, -	4 PRAs, with
	BPR	As	
MD=40%	0.8821	0.0010	0.8841
MD=50%	0.9086	0.0009	0.9104
MD=60%	0.9251	0.0009	0.9269
MD=70%	0.9341	0.0010	0.9361
MD=80%	0.9372	0.0009	0.9390
MD=90%	0.9347	0.0009	0.9365
MD=100%	0.9324	0.0009	0.9342
24-Plate Basket,	4.70 w/o U-23	35, 2200 ppm, 3	8 PRAs, with
,	BPR	As	,
MD=40%	0.8717	0.0009	0.8735
MD=50%	0.9006	0.0010	0.9026
MD=60%	0.9185	0.0011	0.9207
MD=70%	0.9304	0.0009	0.9322
MD=80%	0.9344	0.0010	0.9364
MD=90%	0.9351	0.0010	0.9371
MD=100%	0.9323	0.0009	0.9341

(continued)



CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Model	k _{KENO}	1σ	k _{eff}		
Description	<u> </u>	<u>, </u>			
16-Plate Baske	et, 3.65 w/o U-2	235, 2300 ppm	, No PRAs,		
with BPRAs					
MD=40%	0.9015	0.0010	0.9035		
MD=50%	0.9242	0.0009	0.9260		
MD=60%	0.9330	0.0010	0.9350		
MD=70%	0.9363	0.0009	0.9381		
MD=80%	0.9342	0.0009	0.9360		
MD=90%	0.9282	0.0009	0.9300		
MD=100%	0.9166	0.0010	0.9186		
24-Plate Baske	et, 3.90 w/o U-2	235, 2300 ppm	, No PRAs,		
	with BP	'RAs			
MD=40%	0.8962	0.0009	0.8980		
MD=50%	0.9171	0.0010	0.9191		
MD=60%	0.9279	0.0009	0.9297		
MD=70%	0.9363	0.0009	0.9381		
MD=80%	0.9362	0.0011	0.9384		
MD=90%	0.9311	0.0009	0.9329		
MD=100%	0.9245	0.0009	0.9263		
24-Plate Basket 4 40 w/o IL-235 2300 nnm 4 PDAs with					
	BPR.	As			
MD=40%	0.8855	0.0010	0.8875		
MD=50%	0.9112	0.0009	0.9130		
MD=60%	0.9270	0.0009	0.9288		
MD=70%	0.9346	0.0009	0.9364		
MD=80%	0.9364	0.0008	0.9380		
MD=90%	0.9341	0.0009	0.9359		
MD=100%	0.9306	0.0009	0.9324		
24-Plate Basket	4.80 w/o U-23	5. 2300 ppm.	8 PRAs. with		
	BPR.	As	o 1 1115, 111		
MD=40%	0.8742	0.0008	0.8758		
MD=50%	0.9020	0.0009	0.9038		
MD=60%	0.9190	0.0011	0.9212		
MD=70%	0.9300	0.0010	0.9320		
MD=80%	0.9337	0.0010	0.9357		
MD=90%	0.9354	0.0009	0.9372		
MD=100%	0.9318	0.0012	0.9342		

(continued)



CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Model Description	k _{keno}	1σ	k _{eff}			
16-Plate Baske	16-Plate Basket, 3.80 w/o U-235, 2400 ppm, No PRAs,					
	with BP	PRAs				
MD=40%	0.9044	0.0010	0.9064			
MD=50%	0.9259	0.0010	0.9279			
MD=60%	0.9348	0.0010	0.9368			
MD=70%	0.9371	0.0008	0.9387			
MD=80%	0.9351	0.0009	0.9369			
MD=90%	0.9276	0.0011	0.9298			
MD=100%	0.9174	0.0009	0.9192			
24-Plate Baske	et, 4.00 w/o U-2	235, 2400 ppm	, No PRAs,			
	with BP	PRAs				
MD=40%	0.9001	0.0009	0.9019			
MD=50%	0.9210	0.0010	0.9230			
MD=60%	0.9326	0.0011	0.9348			
MD=70%	0.9380	0.0009	0.9398			
MD=80%	0.9366	0.0009	0.9384			
MD=90%	0.9318	0.0009	0.9336			
MD=100%	0.9227	0.0010	0.9247			
24-Plate Basket, 4.50 w/o II-235, 2400 nnm 4 PRAs with						
,	BPR	As	· , · · - · -			
MD=40%	0.8876	0.0008	0.8892			
MD=50%	0.9123	0.0008	0.9139			
MD=60%	0.9271	0.0010	0.9291			
MD=70%	0.9353	0.0010	0.9373			
MD=80%	0.9361	0.0010	0.9381			
MD=90%	0.9348	0.0010	0.9368			
MD=100%	0.9283	0.0011	0.9305			
24-Plate Basket.	4.90 w/o U-23	5. 2400 ppm.	8 PRAs, with			
	BPR	As	,			
MD=40%	0.8753	0.0009	0.8771			
MD=50%	0.9032	0.0010	0.9052			
MD=60%	0.9206	0.0010	0.9226			
MD=70%	0.9294	0.0009	0.9312			
MD=80%	0.9346	0.0011	0.9368			
MD=90%	0.9350	0.0009	0.9368			
MD=100%	0.9311	0.0010	0.9331			

(continued)

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CE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Medel					
Description	k _{KENO}	1σ	k _{eff}		
16-Plate Basket, 3.90 w/o U-235, 2500 ppm, No PRAs.					
	with Bl	PRAs	, ,		
MD=40%	0.9074	0.0010	0.9094		
MD=50%	0.9287	0.0009	0.9305		
MD=60%	0.9379	0.0009	0.9397		
MD=70%	0.9384	0.0010	0.9404		
MD=80%	0.9350	0.0009	0.9368		
MD=90%	0.9270	0.0009	0.9288		
MD=100%	0.9181	0.0009	0.9199		
24-Plate Bask	et. 4.05 w/o U-	235, 2500 ppn	n. No PRAs.		
	with BI	PRAs	, ,		
MD=40%	0.8995	0.0008	0.9011		
MD=50%	0.9206	0.0010	0.9226		
MD=60%	0.9312	0.0011	0.9334		
MD=70%	0.9351	0.0011	0.9373		
MD=80%	0.9332	0.0010	0.9352		
MD=90%	0.9286	0.0011	0.9308		
MD=100%	0.9212	0.0008	0.9228		
24-Plate Basket	. 4.60 w/o U-2.	35, 2500 ppm.	4 PRAs. with		
	BPR	As	,		
MD=40%	0.8923	0.0010	0.8943		
MD=50%	0.9143	0.0010	0.9163		
MD=60%	0.9266	0.0010	0.9286		
MD=70%	0.9359	0.0009	0.9377		
MD=80%	0.9369	0.0010	0.9389		
MD=90%	0.9342	0.0009	0.9360		
MD=100%	0.9278	0.0008	0.9294		
24-Plate Basket	. 5.00 w/o U-2.	35, 2500 ppm.	8 PRAs. with		
	BPR	As	· · · · · · · · · · · · · · · · · · ·		
MD=40%	0.8799	0.0008	0.8815		
MD=50%	0.9052	0.0010	0.9072		
MD=60%	0.9211	0.0010	0.9231		
MD=70%	0.9310	0.0011	0.9332		
MD=80%	0.9341	0.0010	0.9361		
MD=90%	0.9326	0.0008	0.9342		
MD=100%	0.9288	0.0010	0.9308		

(concluded)



WE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Model Description	k _{keno}	1σ	k _{eff}
WE 14x14 ZCA/ZCB,	1800 ppm boi	ron, 16 Poison	plates, 3.55
wt% U-2	235, No PRAs,	No BPRAs	
MD = 40%	0.9125	0.0009	0.9143
MD = 50%	0.9284	0.0010	0.9304
MD = 55%	0.9315	0.0010	0.9335
MD = 60%	0.9312	0.0010	0.9332
$\mathbf{MD} = \mathbf{65\%}$	0.9329	0.0011	0.9351
MD = 70%	0.9325	0.0010	0.9345
MD = 80%	0.9253	0.0009	0.9271
MD = 90%	0.9153	0.0010	0.9173
MD = 100%	0.9052	0.0010	0.9072
WE 14x14 ZCA/ZCB,	1800 ppm bor	ron, 24 Poison	plates, 3.75
wt% U-2	235, No PRAs,	No BPRAs	_
MD = 40%	0.9034	0.0012	0.9058
MD = 50%	0.9241	0.0010	0.9261
MD = 55%	0.9283	0.0010	0.9303
MD = 60%	0.9304	0.0010	0.9324
MD = 65%	0.9333	0.0012	0.9357
$\mathbf{MD} = 70\%$	0.9351	0.0011	0.9373
MD = 75%	0.9337	0.0010	0.9357
MD = 80%	0.9325	0.0011	0.9347
MD = 90%	0.9259	0.0010	0.9279
MD = 100%	0.9183	0.0010	0.9203
WE 14x14 ZCA/ZCB,	1800 ppm bor	ron, 24 Poison	plates, 4.40
wt% U-	235, 04 PRAs,	No BPRAs	
MD = 40%	0.8927	0.0010	0.8947
MD = 50%	0.9158	0.0010	0.9178
MD = 60%	0.9276	0.0010	0.9296
MD = 65%	0.9321	0.0010	0.9341
MD = 70%	0.9328	0.0010	0.9348
MD = 75%	0.9335	0.0010	0.9355
$\mathbf{MD} = \mathbf{80\%}$	0.9348	0.0009	0.9366
MD = 85%	0.9332	0.0009	0.9350
MD = 90%	0.9302	0.0009	0.9320
MD = 100%	0.9251	0.0011	0.9273

WE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration) (continued)

Model Description	k _{keno}	1σ	\mathbf{k}_{eff}
WE 14x14 ZCA/ZCB,	1800 ppm bor	on, 16 Poison	plates, 3.55
wt% U-2	35, No PRAs,	with BPRAs	
MD=40%	0.9095	0.0009	0.9113
MD=50%	0.9241	0.0009	0.9259
MD=60%	0.9302	0.0010	0.9322
MD=70%	0.9299	0.0010	0.9319
MD=80%	0.9266	0.0011	0.9288
MD=90%	0.9192	0.0008	0.9208
MD=100%	0.9100	0.0010	0.9120
WE 14x14 ZCA/ZCB,	1800 ppm bor	on, 24 Poison	plates, 3.75
wt% U-2	35, No PRAs,	with BPRAs	
MD=40%	0.8963	0.0009	0.8981
MD=50%	0.9164	0.0011	0.9186
MD=60%	0.9258	0.0010	0.9278
MD=70%	0.9330	0.0009	0.9348
MD=80%	0.9318	0.0010	0.9338
MD=90%	0.9287	0.0012	0.9311
MD=100%	0.9224	0.0011	0.9246
WE 14x14 ZCA/ZCB,	1800 ppm bor	on, 24 Poison	plates, 4.40
wt% U-2	35, 04 PRAs,	with BPRAs	
MD=40%	0.8900	0.0010	0.8920
MD=50%	0.9097	0.0009	0.9115
MD=60%	0.9226	0.0009	0.9244
MD=70%	0.9280	0.0009	0.9298
MD=80%	0.9295	0.0010	0.9315
MD=90%	0.9271	0.0010	0.9291
MD=100%	0.9253	0.0012	0.9277

Table M.6-43WE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate
Configurations, Variable Soluble Boron Concentration)

	· · · ·	,			
Model Description	k _{KENO}	1σ	k _{eff}		
WE 14x14 ZCA/ZCB, 2000 ppm boron, 16 Poison plates, 3.75					
wt% U-235, No PRAs, No BPRAs					
MD = 40%	0.9192	0.0009	0.9210		
MD = 50%	0.9305	0.0009	0.9323		
MD = 55%	0.9338	0.0010	0.9358		
$\mathbf{MD} = 60\%$	0.9351	0.0009	0.9369		
MD = 65%	0.9337	0.0009	0.9355		
MD = 70%	0.9297	0.0009	0.9315		
MD = 80%	0.9232	0.0010	0.9252		
MD = 90%	0.9119	0.0008	0.9135		
MD = 100%	0.8991	0.0009	0.9009		
WE 14x14 ZCA/ZCB,	2000 ppm bor	ron, 24 Poison	plates, 3.90		
wt% U-:	235, No PRAs,	No BPRAs	-		
MD = 40%	0.9037	0.0010	0.9057		
MD = 50%	0.9235	0.0010	0.9255		
MD = 55%	0.9286	0.0011	0.9308		
MD = 60%	0.9295	0.0009	0.9313		
MD = 65%	0.9310	0.0011	0.9332		
MD = 70%	0.9305	0.0010	0.9325		
MD = 80%	0.9273	0.0009	0.9291		
MD = 90%	0.9183	0.0009	0.9201		
MD = 100%	0.9141	0.0009	0.9159		
WE 14x14 ZCA/ZCB,	2000 ppm bor	ron, 24 Poison	plates, 4.60		
wt% U-	235, 04 PRAs,	No BPRAs			
MD = 40%	0.8969	0.0009	0.8987		
MD = 50%	0.9175	0.0009	0.9193		
MD = 60%	0.9269	0.0011	0.9291		
MD = 65%	0.9309	0.0009	0.9327		
MD = 70%	0.9310	0.0011	0.9332		
MD = 75%	0.9315	0.0009	0.9333		
MD = 80%	0.9304	0.0010	0.9324		
MD = 85%	0.9267	0.0009	0.9285		
MD = 90%	0.9258	0.0010	0.9278		
MD = 100%	0.9191	0.0009	0.9209		

(continued)



WE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

(continued)

Model Description	k _{keno}	1σ	k _{eff}		
WE 14x14 ZCA/ZCB,	WE 14x14 ZCA/ZCB, 2100 ppm boron, 16 Poison plates, 3.80				
wt% U-	wt% U-235, No PRAs, No BPRAs				
MD = 40%	0.9173	0.0009	0.9191		
MD = 50%	0.9284	0.0009	0.9302		
$\underline{MD = 55\%}$	0.9324	0.0009	0.9342		
MD = 60%	0.9315	0.0011	0.9337		
MD = 65%	0.9292	0.0009	0.9310		
MD = 70%	0.9280	0.0010	0.9300		
MD = 80%	0.9180	0.0010	0.9200		
MD = 90%	0.9086	0.0010	0.9106		
MD = 100%	0.8954	0.0010	0.8974		
WE 14x14 ZCA/ZCB,	2100 ppm bor	on, 24 Poison	plates, 4.00		
wt% U-:	235, No PRAs,	No BPRAs	-		
MD = 40%	0.9096	0.0011	0.9118		
MD = 50%	0.9260	0.0009	0.9278		
MD = 55%	0.9295	0.0010	0.9315		
$\mathbf{MD} = 60\%$	0.9329	0.0009	0.9347		
MD = 65%	0.9321	0.0010	0.9341		
MD = 70%	0.9322	0.0009	0.9340		
MD = 80%	0.9256	0.0011	0.9278		
MD = 90%	0.9193	0.0009	0.9211		
MD = 100%	0.9071	0.0010	0.9091		
WE 14x14 ZCA/ZCB,	2100 ppm bor	on, 24 Poison	plates, 4.75		
wt% U-	235, 04 PRAs,	No BPRAs			
MD = 40%	0.9021	0.0011	0.9043		
MD = 50%	0.9197	0.0009	0.9215		
MD = 60%	0.9308	0.0008	0.9324		
MD = 65%	0.9340	0.0009	0.9358		
MD = 70%	0.9349	0.0010	0.9369		
MD = 75%	0.9332	0.0010	0.9352		
MD = 80%	0.9316	0.0009	0.9334		
MD = 90%	0.9267	0.0011	0.9289		
MD = 100%	0.9185	0.0011	0.9207		

WE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

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Model Description	k _{keno}	1σ	k _{eff}		
WE 14x14 ZCA/ZCB,	2200 ppm boi	ron, 16 Poison	plates, 3.90		
wt% U-	wt% U-235, No PRAs, No BPRAs				
MD = 40%	0.9200	0.0009	0.9218		
MD = 50%	0.9315	0.0009	0.9333		
MD = 55%	0.9330	0.0008	0.9346		
MD = 60%	0.9329	0.0010	0.9349		
MD = 65%	0.9310	0.0008	0.9326		
MD = 70%	0.9276	0.0010	0.9296		
MD = 80%	0.9180	0.0009	0.9198		
MD = 90%	0.9073	0.0009	0.9091		
MD = 100%	0.8936	0.0008	0.8952		
WE 14x14 ZCA/ZCB,	2200 ppm bor	on, 24 Poison	plates, 4.10		
wt% U-	235, No PRAs,	No BPRAs			
MD = 40%	0.9099	0.0010	0.9119		
MD = 50%	0.9271	0.0010	0.9291		
MD = 55%	0.9314	0.0010	0.9334		
$\mathbf{MD} = 60\%$	0.9333	0.0011	0.9355		
MD = 65%	0.9324	0.0010	0.9344		
MD = 70%	0.9331	0.0011	0.9353		
MD = 80%	0.9276	0.0010	0.9296		
MD = 90%	0.9175	0.0011	0.9197		
MD = 100%	0.9062	0.0010	0.9082		
WE 14x14 ZCA/ZCB,	2200 ppm bor	on, 24 Poison	plates, 4.85		
wt% U-	235, 04 PRAs,	No BPRAs			
MD = 40%	0.9021	0.0010	0.9041		
MD = 50%	0.9226	0.0009	0.9244		
MD = 60%	0.9317	0.0012	0.9341		
MD = 65%	0.9330	0.0010	0.9350		
$\mathbf{MD} = 70\%$	0.9335	0.0010	0.9355		
MD = 75%	0.9316	0.0010	0.9336		
MD = 80%	0.9311	0.0010	0.9331		
MD = 90%	0.9254	0.0009	0.9272		
MD = 100%	0.9160	0.0011	0.9182		

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WE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

(continued)				
Model Description	k _{keno}	1σ	k _{eff}	
WE 14x14 ZCA/ZCB,	2200 ppm boi	ron, 16 Poison	plates, 3.90	
wt% U-2	35, No PRAs,	with BPRAs	-	
MD=40%	0.9184	0.0008	0.9200	
MD=50%	0.9270	0.0009	0.9288	
MD=60%	0.9307	0.0009	0.9325	
MD=70%	0.8879	0.0009	0.8897	
MD=80%	0.9010	0.0010	0.9030	
MD=90%	0.9113	0.0010	0.9133	
MD=100%	0.9014	0.0010	0.9034	
WE 14x14 ZCA/ZCB,	2200 ppm boi	ron, 24 Poison	plates, 4.10	
wt% U-2	35, No PRAs,	with BPRAs		
MD=40%	0.9049	0.0009	0.9067	
MD=50%	0.9202	0.0010	0.9222	
MD=60%	0.9305	0.0010	0.9325	
MD=70%	0.9304	0.0008	0.9320	
MD=80%	0.9090	0.0009	0.9108	
MD=90%	0.9223	0.0011	0.9245	
MD=100%	0.9161	0.0010	0.9181	
WE 14x14 ZCA/ZCB,	2200 ppm bor	ron, 24 Poison	plates, 4.85	
wt% U-235, 04 PRAs, with BPRAs				
MD=40%	0.9008	0.0010	0.9028	
MD=50%	0.9177	0.0010	0.9197	
MD=60%	0.9261	0.0011	0.9283	
MD=70%	0.9306	0.0009	0.9324	
MD=80%	0.9283	0.0009	0.9301	
MD=90%	0.9243	0.0011	0.9265	
MD=100%	0.9189	0.0009	0.9207	

(continued)



WE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

(continued)

Model Description	k _{KENO}	1σ	k _{eff}		
WE 14x14 ZCA/ZCB,	2300 ppm bor	ron, 16 Poison	plates, 4.00		
wt% U-2	235, No PRAs,	No BPRAs			
MD = 40%	0.9222	0.0009	0.9240		
MD = 50%	0.9311	0.0008	0.9327		
MD = 55%	0.9341	0.0010	0.9361		
$\mathbf{MD} = 60\%$	0.9345	0.0009	0.9363		
MD = 65%	0.9310	0.0009	0.9328		
MD = 70%	0.9274	0.0009	0.9292		
MD = 80%	0.9183	0.0009	0.9201		
MD = 90%	0.9060	0.0010	0.9080		
MD = 100%	0.8934	0.0009	0.8952		
WE 14x14 ZCA/ZCB,	2300 ppm bor	on, 24 Poison	plates, 4.20		
wt% U-3	235, No PRAs,	No BPRAs	-		
MD = 40%	0.9140	0.0009	0.9158		
MD = 50%	0.9295	0.0010	0.9315		
MD = 55%	0.9344	0.0011	0.9366		
MD = 60%	0.9336	0.0009	0.9354		
MD = 65%	0.9337	0.0009	0.9355		
MD = 70%	0.9322	0.0011	0.9344		
MD = 80%	0.9256	0.0010	0.9276		
MD = 90%	0.9185	0.0010	0.9205		
MD = 100%	0.9049	0.0009	0.9067		
WE 14x14 ZCA/ZCB,	2300 ppm bor	on, 24 Poison	plates, 5.00		
wt% U-	wt% U-235, 04 PRAs, No BPRAs				
MD = 40%	0.9076	0.0009	0.9094		
MD = 50%	0.9260	0.0009	0.9278		
MD = 60%	0.9323	0.0009	0.9341		
MD = 65%	0.9350	0.0009	0.9368		
$\mathbf{MD} = 70\%$	0.9356	0.0010	0.9376		
MD = 75%	0.9333	0.0011	0.9355		
MD = 80%	0.9313	0.0010	0.9333		
MD = 90%	0.9240	0.0010	0.9260		
MD = 100%	0.9157	0.0010	0.9177		

WE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

Model Description	k _{keno}	1σ	k _{eff}
WE 14x14 ZCA/ZCB,	2400 ppm bor	on, 16 Poison	plates, 4.10
wt% U-2	235, No PRAs,	No BPRAs	-
MD = 40%	0.9243	0.0010	0.9263
MD = 50%	0.9343	0.0009	0.9361
MD = 55%	0.9354	0.0010	0.9374
MD = 60%	0.9344	0.0010	0.9364
MD = 65%	0.9318	0.0008	0.9334
MD = 70%	0.9286	0.0009	0.9304
MD = 80%	0.9185	0.0009	0.9203
MD = 90%	0.9060	0.0009	0.9078
MD = 100%	0.8917	0.0008	0.8933
WE 14x14 ZCA/ZCB, 2400 ppm boron, 24 Poison plates, 4.30			
wt% U-2	235, No PRAs,	No BPRAs	
MD = 40%	0.9166	0.0009	0.9184
MD = 50%	0.9305	0.0010	0.9325
MD = 55%	0.9330	0.0010	0.9350
MD = 60%	0.9334	0.0010	0.9354
MD = 65%	0.9335	0.0010	0.9355
MD = 70%	0.9327	0.0011	0.9349
MD = 80%	0.9250	0.0011	0.9272
MD = 90%	0.9147	0.0010	0.9167
MD = 100%	0.9044	0.0010	0.9064

(continued)

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WE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

(••••••••)			
Model Description	K _{keno}	1σ	k _{eff}
WE 14x14 ZCA/ZCB,	2500 ppm bor	on, 16 Poison	plates, 4.15
wt% U-2	235, No PRAs,	No BPRAs	
MD = 40%	0.9253	0.0010	0.9273
MD = 50%	0.9329	0.0009	0.9347
MD = 55%	0.9333	0.0011	0.9355
MD = 60%	0.9314	0.0010	0.9334
MD = 65%	0.9285	0.0009	0.9303
MD = 70%	0.9250	0.0010	0.9270
MD = 80%	0.9137	0.0009	0.9155
MD = 90%	0.9013	0.0009	0.9031
MD = 100%	0.8859	0.0010	0.8879
WE 14x14 ZCA/ZCB,	2500 ppm boi	on, 24 Poison	plates, 4.40
wt% U-2	235, No PRAs,	No BPRAs	-
MD = 40%	0.9191	0.0010	0.9211
MD = 50%	0.9314	0.0010	0.9334
MD = 55%	0.9353	0.0010	0.9373
MD = 60%	0.9332	0.0008	0.9348
MD = 65%	0.9335	0.0010	0.9355
MD = 70%	0.9318	0.0010	0.9338
MD = 80%	0.9226	0.0010	0.9246
MD = 90%	0.9155	0.0010	0.9175
MD = 100%	0.9032	0.0010	0.9052

(continued)



Table M.6-43 WE 14x14 Class Assembly Final Results with and without BPRAs (16 or 24 Poison Plate Configurations, Variable Soluble Boron Concentration)

(
Model Description	k _{KENO}	1σ	k _{eff}	
WE 14x14 ZCA/ZCB,	2500 ppm bor	on, 16 Poison	plates, 4.15	
wt% U-2	35, No PRAs,	with BPRAs		
MD=40%	0.9213	0.0009	0.9231	
MD=50%	0.9315	0.0008	0.9331	
MD=60%	0.9301	0.0009	0.9319	
MD=70%	0.9254	0.0010	0.9274	
MD=80%	0.9185	0.0008	0.9201	
MD=90%	0.9057	0.0009	0.9075	
MD=100%	0.8975	0.0009	0.8993	
WE 14x14 ZCA/ZCB,	WE 14x14 ZCA/ZCB, 2500 ppm boron, 24 Poison plates, 4.40			
wt% U-2	wt% U-235, No PRAs, with BPRAs			
MD=40%	0.9132	0.0010	0.9152	
MD=50%	0.9265	0.0010	0.9285	
MD=60%	0.9324	0.0011	0.9346	
MD=70%	0.9312	0.0010	0.9332	
MD=80%	0.9277	0.0009	0.9295	
MD=90%	0.9225	0.0010	0.9245	
MD=100%	0.9121	0.0010	0.9141	

(concluded)

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P.1.1 Introduction

The NUHOMS[®]-24PTH system is designed to store up to 24 intact (including reconstituted) B&W 15x15, WE 17x17, CE 15x15, WE 15x15, CE 14x14, and WE 14x14 class PWR fuel assemblies. WE 15x15 Partial Length Shield Assemblies (PLSAs) are also authorized to be stored in the 24PTH system. The fuel to be stored is limited to a maximum assembly average initial enrichment of 5.0 wt. %, a maximum assembly average burnup of 62 GWd/MTU, and a minimum cooling time of 3.0 years. The long cavity 24PTH-L and 24PTH-S-LC DSC types are also designed to store up to 24 Control Components (CCs) which include Burnable Poison Rod Assemblies (BPRAs), Thimble Plug Assemblies (TPAs), Control Rod Assemblies (CRAs), Rod Cluster Control Assemblies (RCCAs), Axial Power Shaping Rod Assemblies (APSRAs), Orifice Rod Assemblies (ORAs), Vibration Suppression Inserts (VSIs), Neutron Source Assemblies (NSAs) and Neutron Sources. The design characteristics, including physical and radiological parameters of the payload, are described in Chapter P.2.

Reconstituted assemblies containing up to 10 replacement stainless steel rods per assembly or unlimited number of lower enrichment UO_2 rods instead of Zircaloy clad enriched UO_2 rods are acceptable for storage in 24PTH DSC as intact fuel assemblies with a slightly longer cooling time than that required for a standard assembly. The maximum number of reconstituted fuel assemblies per DSC is four.

Provisions have been made for storage of up to 12 damaged fuel assemblies in lieu of an equal number of intact assemblies in cells located at the outer edge of the 24PTH basket. Damaged PWR fuel assemblies are assemblies containing missing or partial fuel rods or fuel rods with known or suspected cladding defects greater hairline cracks or pinhole leaks. The DSC basket cells which store damaged fuel assemblies are provided with top and bottom end caps to assure retrievability.

The NUHOMS[®]-24PTH system consists of the following new or modified components:

- A 24PTH DSC, with three alternate configurations, described in detail in Section P.1.2, provides confinement, an inert environment, structural support, and criticality control for the 24 PWR fuel assemblies,
- A HSM-H module, described in Section P.1.2, is provided for environmental protection, shielding and heat rejection during storage, and
- OS197-FC transfer cask for onsite transfer of the 24PTH-S and 24PTH-L DSCs. The NUHOMS[®]-24PTH-S and 24PTH-L DSCs with Types 1A, 1B, 1C baskets can also be transferred in the OS197/OS197H TCs if the total heat load is 31.2 kW or less.

In addition to these new or modified components listed above, the 24PTH-S-LC DSC requires the use of the existing Standardized HSM Model 102 or the new HSM-H for storage and the Standardized Transfer Cask for transfer.

The NUHOMS[®]-24PTH system requires the use of non-safety related auxiliary transfer equipment described in Section 1.3.2.2 of the FSAR. There is no change to any of these items except for the cask support skid. The cask support skid is modified by adding two industrial

December 2006 Revision 0 grade motor driven redundant blowers with associated ductwork for connecting to the TC ram cover plate opening. This modification provides a reliable source of external air circulation for the OS197FC TC.

Approval of the NUHOMS[®]-24PTH system components described in Chapter P.1.2 is sought under the provisions of 10CFR 72, Subpart I for use under the general license provisions of 10CFR 72, Subpart K. The 24PTH system components are intended for storage on a reinforced concrete pad.

P.2.1 Spent Fuel To Be Stored

As described in Chapter P.1, there are three design configurations for the NUHOMS[®]-24PTH DSC; S, L and S-LC. Each of the DSC configurations is designed to store intact (including reconstituted) and/or damaged PWR fuel assemblies as specified in Table P.2-1 and Table P.2-3. The fuel to be stored is limited to a maximum assembly average initial enrichment of 5.0 wt. % ²³⁵U. The maximum allowable assembly average burnup is limited to 62 GWd/MTU and the minimum cooling time is 3 years. The 24PTH-L and 24PTH-S-LC DSCs are also designed to store Control Components (CCs) with thermal and radiological characteristics as listed in Table P.2-2. The CCs include Burnable Poison Rod Assemblies (BPRAs), Thimble Plug Assemblies (TPAs), Control Rod Assemblies (CRAs), Rod Cluster Control Assemblies (RCCAs), Axial Power Shaping Rod Assemblies (APSRAs), Orifice Rod Assemblies (ORAs), Vibration Suppression Inserts (VSIs), Neutron Source Assemblies (NSAs), and Neutron Sources.

Partial Length Shield Assemblies (PLSAs) for the Westinghouse 15x15 class, where part of the active fuel is replaced with steel are also included as authorized

Reconstituted assemblies containing up to 10 replacement stainless steel rods per assembly or unlimited number of lower enrichment UO_2 rods are acceptable for storage in 24PTH DSC as intact fuel assemblies. The stainless steel rods are assumed to have two-thirds the irradiation time as the remaining fuel rods of the assembly. The reconstituted UO_2 rods are assumed to have the same irradiation history as the entire fuel assembly. The reconstituted rods can be at any location in the fuel assemblies. The maximum number of reconstituted fuel assemblies per DSC is four.

The NUHOMS[®]-24PTH DSCs can also accommodate up to a maximum of 12 damaged fuel assemblies placed in cells located at the outer edge of the DSC as shown in Figure P.2-6. Damaged PWR fuel assemblies are assemblies containing missing or partial fuel rods, or fuel rods with known or suspected cladding defects greater hairline cracks, or pinhole leaks. The extent of damage in the fuel rods is to be limited such that a fuel pellet is not able to pass through the damaged cladding during handling and retrievability is assured following normal and offnormal conditions. The DSC basket cells which store damaged fuel assemblies are provided with top and bottom end caps to assure retrievability.

A 24PTH DSC containing less than 24 fuel assemblies may contain either empty slots or dummy fuel assemblies in the empty slots. The dummy assemblies are unirradiated, stainless steel encased structures that approximate the weight and center of gravity of a fuel assembly.

The NUHOMS[®]-24PTH-S and 24PTH-L DSCs may store up to 24 PWR fuel assemblies arranged in any of the four alternate heat load zoning configurations shown in Figure P.2-1 through Figure P.2-4 with a maximum decay heat of 2.0 kW per assembly and a maximum heat load of 40.8 kW per canister.

The 24PTH-S-LC may store up to 24 B&W 15x15 fuel assemblies arranged in accordance with heat load zoning configuration No. 5 with a maximum decay heat of 1.5 kW per assembly and a maximum heat load of 24.0 kW per DSC, as shown in Figure P.2-5.
The 24PTH DSC basket is designed with 2 alternate options: Type 1 basket, which includes aluminum inserts in the R45 transition rails, and Type 2 basket which does not include any aluminum inserts. Type 1 basket is the preferred option for canisters with high decay heat loads, since the aluminum inserts allow a more direct heat conduction path from the basket edge to the

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Intact or damaged unconsolidated B&W $15x15$, WE $17x17$, CE $15x15$, WE $15x15$, CE $14x14$ and WE $14x14$ class PWR assemblies (with or without control components) that are enveloped by the fuel assembly design characteristics listed in Table P.2-3. Equivalent reload fuel manufactured by other vendors but enveloped by the design characteristics listed in Table P.2-3 is also acceptable.
Damaged PWR fuel assemblies are assemblies containing missing or partial fuel rods or fuel rods with known or suspected cladding defects greater than hairline cracks or pinhole leaks. The extent of cladding damage in the fuel rods is to be limited such that a fuel pellet is not able to pass through the damaged cladding during handling and retrievability is assured following normal and off-normal conditions.
 WE 15x15 class PLSAs with following characteristics are authorized: Maximum burnup, 40 GWd/MTU Minimum cooling time, 6.5 years Maximum Decay Heat, 900 Watts
4 10 24
 Up to 24 CCs are authorized for storage in 24PTH-L and 24PTH-S-LC DSCs only. Authorized CCs include Burnable Poison Rod Assemblies (BPRAs), Thimble Plug Assemblies (TPAs), Control Rod Assemblies (CRAs), Rod Cluster Control Assemblies (RCCAs), Axial Power Shaping Rod Assemblies (APSRAs), Orifice Rod Assemblies (ORAs), Vibration Suppression Inserts (VSIs), Neutron Source Assemblies (NSAs), and Neutron Sources. Design basis thermal and radiological characteristics for the CCs are listed in Table P.2-2.
8.536 inches
<u><24</u>
Up to 12 damaged fuel assemblies. Balance may be intact fuel assemblies, empty slots, or dummy assemblies depending on the specific heat load zoning configuration. Damaged fuel assemblies are to be placed in Locations A and/or B as shown in Figure P.2-6. The DSC basket cells which store damaged fuel assemblies are provided with top and bottom end caps to assure retrievability. 1682 lbs

Table P.2-1PWR Fuel Specification for the Fuel to be Stored in the NUHOMS[®]-24PTH DSC

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Table P.2-2 Thermal and Radiological Characteristics for Control Components Stored in the NUHOMS[®] -24PTH DSC

Parameter	BPRAs, NSAs, CRAs, RCCAs, VSIs, Neutron Sources and APSRAs	TPAs and ORAs
Maximum Gamma Source (γ/sec/DSC)	9.3E+14	9.8E+13
Decay Heat (Watts/DSC)	192.0	192.0

Assemb	ly Class	B&W 15x15	WE 17x17	CE 15x15	WE 15x15	CE 14x14	WE 14x14
	24PTH-S	165.75	165.75	165.75	165.75	165.75	165.75
Max Unirradiated Length (in) ⁽¹⁾	24PTH-L	171.93	171.93	171.93	171.93	171.93	171.93
	24PTH-S- LC	171.93	NA ⁽³⁾	NA ⁽³⁾	NA ⁽³⁾	NA ⁽³⁾	NA ⁽³⁾
Fissile Materia	ıl	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂	UO ₂
Maximum MT	U/Assembly ⁽²⁾	0.49	0.49	0.49	0.49 ⁽⁴⁾	0.49	0.49
Maximum Nu Rods	mber of Fuel	208	264	216	204	176	179
Maximum Nu Guide/ Instrun	mber of nent Tubes	. 17	25	9	21	5	17

PWR Fuel Assembly Design Characteristics for the NUHOMS[®]-24PTH DSC

(2) The maximum MTU/assembly is based on the shielding analysis. The listed value is higher than the actual.

(3) Not Authorized.

(4) The maximum MTU/assembly for WE 15x15 PLSA = 0.33.

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⁽¹⁾ Maximum Assembly + Control Component Length (unirradiated)



PWR Fuel Qualification Table for Zone 1 Fuel with 1.7 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/o CCs)

(Minimum required years of cooling time after reactor core discharge)

Burn														_M	axin	num	ı As	ser	nbly	<u>/ Av</u>	era	ge I	Initia	al U-	235	5 En	irich	imei	nt, v	rt. %	Ď												
GWD/ MTU	0.7	2.8 0.9	9 1.0) 1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0 4.	1 4	1.2 4.	3 4	1.4	4.5	4.6	4.7	4.8	4.9	5.0
10	3.0	3.0 3.0) 3.0) 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3.	0 3	3.0 3.	0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3.0 3.0) 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3.	0 3	3.0 3.	0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.0 3.0) 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	J 3.C	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3.	0 3	3.0 3.	.0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25						· .		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0) 3.C	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3.	0 3	3.0 3.	.0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28	Toler of the sec	anga dara dara dara dara	ar and an a	-	tad <u>elett der</u> to		dine for the	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3.	0 3	3.0 3.	.0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30		ante Curkandan		6706404000	and the second second	edonetes	anaran a	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3.	0 3	3.0 3.	.0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32								3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3.	03	3.0 3.	.0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0
34	nolpau.do		d's a damat					3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3.	03	3.0 3.	.0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0
36		her umgete site	2.6. n. dater	001490.auto		medižečka	-a.embercht	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	; 3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3.	0 3	3.0 3.	.0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0
38	Tuinnan a	10. Gertretti (4-015 1990			and the state of the		4.5	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5 3.	5 3	3.5 3.	.0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0
39	1949-1946. g. de		200,0.000			ranne ng		4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	; 3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5 3.	5 3	3.5 3.	5 3	3.5	3.5	3.5	3.5	3.5	3.5	3.5
40	1012000100	10 Martin (10 4	an uteran	annais an a	numien		to and the states	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	; 3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5 3.	5 3	3.5 3.	5 3	3.5	3.5	3.5	3.5	3.5	3.5	3.5
41	horationa	L. Manarate Toris	- MAN ANAL	and a second	h		grandingin	5.0	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	14.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5 3.	5 3	3.5 3.	5 3	3.5	3.5	3.5	3.5	3.5	3.5	3.5
42	Distantion of	le ul p asta r cum de d	an same	anganjanging	nor c ipror ise	andigate		o di aji dona d	inang aast	Com 1030 00 - 34,00 Ga		200 (D-18-16-18	magnuso	narrantilio 10		majuro	. antragro	anderen		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5 3.	5 3	3.5 3.	5 3	3.5	3.5	3.5	3.5	3.5	3.5	3.5
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46	ې بې د مېږې د د	Crasso - strategies	N	ote:	If in	rad	iatec	l sta	inle	ss st	teel	rods	are	pre	sent		Nen aun 197 7	öðarárur	าาก่านกันสุ	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0 4.	0 4	1.0 4.	0 4	1.0	4.0	4.0	4.0	4.0	4.0	4.0
47	Strongstowegt		l in	th i	e re	ecor	istiti	ited	fu	el	asse	mbl	у,	add	an	316700		alleritansige	mannanas	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5 4.	0 4	1.0 4.	.0 4	1.0	4.0	4.0	4.0	4.0	4.0	4.0
48	s hatestinikeeden	o - approximation	a	ditio	onal	yea	of	cool	ing t	time						200-00	a. <i>5</i> .35, 28	i aparati (para		5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5 4.	5 4	1.5 4.	.5 4	1.5	4.5	4.5	4.0	4.0	4.0	4.0
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50	പങ്ങംശവും	an takan sa kata sa ka	wanitaa	anguar, 1979,	Vertikest Jacobi		i.				ijan un mun				angat dan d	1121-734123	laŭ ĝo entre	ى ئىسىيە مى	ø				5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5 4.	5 4	1.5 4.	.5 4	4.5	4.5	4.5	4.5	4.5	4.5	4.5
51	extrantaria	urvagan andran	Alternation	transferred and the	nanti opera	n nin ala	and the second second	tin and a star	to Charlet Same	118 2 -1224	nderstatugens	Terlering and	n Station of C	s.co.tatena	and a chair an		age Cooting	Ballanas	Danimin Mari	taligati galan ge	homometer and a	nan Allifandi Alger	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0 4.	5 4	1.5 4.	.5 4	1.5	4.5	4.5	4.5	4.5	4.5	4.5
52	ניני אליבונדעי.	a sa anggi	- and the second se		-2017-022-02	manan	בישרשותים	ter energe of	1077 TOW	an care	v nausre	rac~a.t	æ 1 • Þri - Z2	or <u>æ</u> r <i>rup</i>	యా-యాజ	و منهمه	171-0 -12 1-	w uun e	Surs	2 ~~E~2%	are na		1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 - 1917 -	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0 5.	0 5	5.0 5.	0 5	5.0	5.0	5.0	4.5	4.5	4.5	4.5
53	Langer and the second	r daaraar tiittii toodi	moutini	anatus Maasta	545-36-76-775-36	രം എത്. എറ	ana ma	degininet age.	tin an	r Tanaa di m	day aga ng sang	andanaan	n-and	gga 25 47 17 19	apangalar - 4 wa		-rapanahi	tandrettin.»	-	an and and a	no.			5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0 5.		5.0 5.	0 5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
54		anna de cado -	Na manana		Water again	dinom.,		marc-ana.	-contenencia		45 3		unterread	ana union	1001000	10040 - MILLIN					ന്നതം കാൽത	ttoren atransi	tiono7397tanne	anea yana	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5 5.		5.0 5.	0 5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
55	allerine t ar	atto relificaly. The	Dw943.000	and the state of the	agen a sonio	140 ALIAN	n the second second	Dywnadarth	1991 200 - 1997	the of the state	7.و.2. احتمرها	naar etter.	പത്ര സെറ്റിട്ടു	stant and	കുത്താം ക	Waltai m	er værense	tilla viensimalijes	n Printergenerati	antitatione	ത്രാണ് പോർറ	vatava atta -	art wijsen	v-10303.	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5 5.	5 5	5.5 5.	5 5).5 	5.0	5.0	5.0	5.0	5.0	5.0
56			താനമാംം		matureation	5 0-700-70-0	n sõndikaitsise		เลเสล์แล้แก	n an		สารกระกับจะ	6 marini	lancos (nico m		anna ann an taobh	n an Alba	10.000.000			- ville Double	að rayn reiligið	5.8°03 0.00-60-	การณภาษริเต	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5 5.	5 5	5.5 5.	5 5).5 	5.5	5.5	5.5	5.5	5.5	5.0
57		agen er staten an	n an	ana ina ina ina ina ina ina ina ina ina	at a state of the		un autorite an	anga 142,474.78	a nan ami'''			r-rate-ar	anna ann an a' an a'	1	n yn newedd	soutra-an	e nore a pre	NA-12492-K	ndanantan (A ANY ALL DRAW	ത്തുന്നത്.സ	uñus our	andras Anthon	n . Mas tania	ana ana -	n na starten a	6.0	6.0	6.0	6.0	6.0	6.0	5.5 5.	515	b.5 5.	5 5	<u>).5</u>	5.5	5.5	5.5	5.5	5.5	5.5
58	າດຜ່ານການນ	ale at the male	020-710 43			la andraa 10	tre openet	nas upauras n	uni mistraa	u ang atala	- ant ann a	- Martinetica	umnai uan		กันคนกับในการ	นาบังคมินอร์	Testinodi	A Tan Garan (W)	Receiving	a	م يتنابيه الأليوني.	duro danado.	politimerues	alloro anny inc	11110-1400-1540	faan aada	6.0	6.0	6.0	6.0	6.0	b.U	6.0 6.		0.016		<u>).0</u>	5.5	5.5	5.5	5.5	5.5	5.5
59	an a			17.2287.572700-		aloradh-ita	ngganaturn		n versour af	Pari A di mani	504-10- 2 40-1	1004 3-000 AF	producers	141 an d' 1420	ഷ്പുറേസം	n ang gang a	an Marana		annartan	ahatahad??	NY TAONANA		27 WALSHIDS	1.22 May 201	teres an	Lizen ante-Alia	0.5	0.5	0.5	0.5	0.0	0.0	0.0 6.		5.016.		<u>).0</u>	0.0	0.0	0.0	0.0	0.0	5.5
60	2192-0-0-022		n yaan taasa	rana anala		మాలి మా శాజ	w	otherada dina	io datano a	er anna frea		illianan në di	Managama 2000	Lananan Maara	innin Vanet	en an			matteressee		5	ก เสียงสายส	u a cana caba			ylan yirin an	6.5	6.5	0.5	0.5	6.5	0.5	0.5 6.		5.5 6.		2.0	0.0	6.0	6.0	6.0	6.0	6.0
61	angene satisfi	สสาวสินเหตุสารสินุมิ	100000	מרשפות הוני		100444	1 -457-0410/			and a state of the	7-15-0-17-12	รางการสมาร	1220 S. (1)	ngapagaa	Adverson 3	540 ·····RA	a na tanan fia	itanaintit	k mitnikalada	ianaan ah	Antorradilla	ംഗത്തുംമ്മ	anaanna.4	ang do Tapas		מעריכה שנייניניים	1.0	1.0	1.0	0.5	6.5	0.5	6.5 6.		b.5 6.	5 6	5.5	0.5	6.0	6.0	6.0	6.0	6.0
62	:			, ···		• .												<u>, </u>									7.0	7.0	7.0	7.0	7.0	7.0	7.0 6.	5 6	ö.5∣6.	5 6	j.5	6.5	6.5	6.5	6.5	6.5	6.5





PWR Fuel Qualification Table for Zone 2 Fuel with 2.0 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/o CCs)

(Minimum required years of cooling time after reactor core discharge)

Burn														M	laxir	mur	n As	sser	nbl	<u>y A</u>	/era	ge l	nitia	al U	-235	5 Er	nrich	nme	ent, v	<i>w</i> t. %	6													
ОР, GWD/ МТU	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	30	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	30
15	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25							l		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28	านหมูอง	e e data data e	, , Digitalian of the	, 10487011940	ផលាយដោ	ាកដោយដូចរបេះ	nio en m <u>u</u> na	nisetiinnut	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30	- municipita	anga spinot -	ninmittang	r anthagtan	elengesterite	alline aquar	n nganta na	ano indiana	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32	- Francisco	egno hitorda	Senerie i duba	19,0000.0000.0000.000	dana waa	nin ontonio	an conner	ore advised	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
34	diat-rite		010 00 00 000		nilastella		aminan.	GROAD COM	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
36]								3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
38]	tala Portun itar							3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
39			tonuttuna		annen	-	marano		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
40	marrie	1994	-		thin man	and and a set	mann-19-19-1	muraturure	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
41		namen azi	n an	an nganga		gun thindpass	egant (2)	anananan sa	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
42	survey.	analasta a	Secondar	ing gains		area and and a	50710 10710010	alexenses		ang majaka	an a	anger (Angen	umranin a	unay na ad	nyiniaana	Gamacou	o par des egus	00000000000000000000000000000000000000	dagespoor.	an annan an	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
43	372458752	Annanga ar			(fililitanyta	Tightada			lead-sector	Lauren ander	naganangan ang sa	upan-du	n Banagian	nternetingen Berennetingen	Antarataria	Stannores	Barthada	<u>m</u> retoont	C MARKE	ana ang ang ang ang ang ang ang ang ang	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0
44	normation		jereza proceda	lille villaraa	ntonintrati	aro-watawa	atogymid og		- ward and y		anderforger	overant	uraningitur	instructu Dilleri	-inanaja <u>p</u> es	conterna	atija Gerala u	tapar na t aj	مەرىق سور		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
45	7102570	oninarijan e se	annunnar-a	<u>hitar</u> ethadj	10-040-04	ho fringda (b	entilitation of	·(2002-20.1	ورفينافين	n and the later in	piadogarou	թարեթուն։	untublich	ifteen vouus	1999-12-12-14	in angang-	atta - Prints	ഹായ്യാവയം	ເມືອງເຫຼົາມ	a-nangero at	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
46	Turnera	nanaasuun ut '	an a	teno untre		arawww.	operating	matantikan	2.000.10 <u>0.00</u>	atoroganom	aantoviatta	re etterni	untertational	noma ng u	ntrið ærstigt	ວ່າມຸກມຽມແຕ	ntera da fas	Latanogramije	ruounon.	andrownite	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
47	an thing	പഞ്ഞുക	Sab-Digord		(Babbababa	angang tangga	nemutro,	a-a-artato-	han ir	1-101- <i>1</i> 010	ուգությ	and and an	anoroma	an survey and a	in the second	anganganga	anagan	No por cuality	สมากสมบุ	ngah ntagi);	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
48	an out		(iterretricente	unia (nunda	on comence	eumpronero	สารคำสุดการเหต	nam uqurus	a darti pra	թետենիստ	aprazanao	Lucionation		an a 19 angag		olova nin a	taros tatos		naunaa	nan anan	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
49	. Innana	and the state of the	nterrition	er og stade	ar sundays to	and and a second	tomogramed	g-one-galle	no construction	5-11 2 2000-0	19 2-1032-1010	le maja jilana	: 	hered a support	alle under	ranta ta	arte a di	and the state of the	aurra t ua	abore or the	-Mangarak Ma	anas na	and the second	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5
50	manth	കണ്ടാണാ	LANGUL MARK	pre-o-minu	ຕາວເມັນ ເມືອກ ແຜ່	11214-1131-09	แหน่นอนค	ana	ແດຍປະທິດ	່ອກກະຫາດ	ការដោះអាការ	1011001000	1991-1991-199	លោកស្វេរាជ	n) sector rector	n-innipin	ອາດາເອັກໃນອີນ	າເສຍາຍເພ	តាលេខារងៈ	u.		•	,	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
- 51	trativiter.		vetenstw	ang	and the second	an a	inge an	gunninan		e Reference de la	toracerica.	an ann an	angang	fan serie	Deulanovo	ikingan p	n van gester de	መካሪይመመ	anijaan geg	aProstati alla	nerozuliste	(Abateritaria)	nashi song	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
52	.0031200	 In annan in the		winner	in the second second	unanan agare	nanuvan.	Loonantaireatha	n christense	EVICENTA A	000000000000	e oznastate	untanansia	ngranda	annenin	o fatternant	naporo-zaz		enno anteo	Eranspara	aanostiiju	Winstates	anto duar	nao wano i	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
53	, saturative	ru taatiina	an contaction	in the second	1. Same an	ing an a contraction	iga-varjar	the optionary	ndraaco	al van by the	ngiya wanga	արտանել	tal ⁷ oonteo	antara (n.193	anu ana ana ana ana ana ana ana ana ana	anter a constant	an a	ang manager	() - managery of the	e dine a'a di	anto"nuarrag				4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
55	110121109	nann onnar S	area area area	N		If :	modi		cto	inlar							Etter.	(nametrika)	no to dro in	annynnary	COMPACTOR .	all a gall and a gall a ga	ajhajitaa.	Clinite de versi	uganana.	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0
56	si natus	wirte auf an	anatika	in	ne. th		rau	atitu	sia	fines fine	ss sr al r		mhl		pre:	sem	ייי ענד	andisatela	no Quan	្លេរាជសារសារ។	1-19-10-200401	ang winni	ມາເຫັນງານ		ութարինու(5.0	5.0	4 .5	5.0	4.5	4.5 5.0	5.0	4.5 5.0	4.5 5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
57	amoint	to that works		ad	un ditic	unal s		of	neu Iooli	ina t	ima	1550	nory	, c	auu	an	tortaon	າເອາະສະດາເອ	naater a	onthe Charles to	er Ganter er av	an tan y	tapoaro.	Par-dam-430	nga-sm a tan-1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
58	2214-122	a 13/49/14	an a	au			y cal	ort	.001	ing t	.mic	•					20.000	ar fur offic	1.99°atin 4.00	erandana eranat	Testicato Acad	and the second	Manotan	tan Ing at	ang Diversed	Pla Rengelaa a	Persidali da	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	50	5.0	5.0	50
59	Jerounat	tortoutter (r)	ารมากกัญหม่อง	BATLICK CONT	o inato da	ageorization	nteret t (m. s.	e un gerie ten o	To State of State	un nontrato	ማ መካ ር ትም	102-10-100	ann sairte an	8 88 9 0,464	freeddaredd	ijost atsa	AND THE OWNER OF THE OWNER OWNER OWNER OWNER O	likov casy cats	failtean an a	1999) In 1999	34 646 77041-JT	go nemo	blebrillige-	ເໝື່ອເມາະເມາ	TO WARKAN (ME)	0.0000000000	www.com	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
60).conusia	, 17200000	erendrammen e	AEDOUDO	anan mara	ationaly dans	1232/02/02/07	ann inneac	- 	te na alau	rangerande	annan ar	n alfra dia i	annar apò		wana an	nya aran	nanafinani v	120,0000000	turumigunga	nationaliste	genetinger	ada sontana	ine mereo año	annan an		. (6.0	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
61	UDARTS		er-So-aned	ບມູບບ່ານແ	ເສັດເຊັ່ນແມ່ນທ		9403014840	แหล่อมเชื้อกา	indistration	លោលឈាប	ານຜູ້ເບັນຕ	manicon	uga e igan-	ที่สุดชาติ แนะ	ແມ່ເອັງຜູ້ແຫຼ	ការបិលណាច •	14 0 94400013	ויוויאנגלינאון	መሆኖርስ ተ	และเอคารรูน	ngeotoga	ningingun L	ព្រះអំហេពិសា	houtruzona	torozof ra ja	មិនីដោយមាម	չվերըումը՝	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
62	Separativo	nastann iat inga	a) magaina	andren an <u>a da</u> n	and Childrens	dave sätter		127782CM	an croane	natanatan	010:0000000000000000000000000000000000	alananan	പയ്യാതവ	0 A LOTAN AND	anansana i	aniaran	and the second	ντονού	unanana C	o o	u dini seli di se		ngangode	allendestrater	Prantik Ma	ggodinicagg	mareavi	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5

් Table P.2-8 PWR Fuel Qualification Table for Zone 3 Fuel with 1.5 kW per Assembly for the NUHOMS®-24PTH DSC (Fuel w/o CCs)

(Minimum required years of cooling time after reactor core discharge)

Burn										Μ	axir	nun	n As	sser	nbly	/ Av	era	ge l	Initia	al U	-235	5 Er	nrich	וme	nt, v	∧ t. %	6													
GWD/	07080	9 1 0 1 1	12	13 14	15	16	17	18	19	20	21	22	23	24	25	2.6	27	28	29	3.0	31	32	33	34	3.5	3.6	37	38	19	104	1	424	43	44	45	46	47	4.8	4 9	5.0
MTU																								<u> </u>		0.0	•								1.0		⊢			
10	3.0 3.0 3.	0 3.0 3.0	3.0	3.0 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 :	3.0 3	.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0 3.0 3.	0 3.0 3.0	3.0	3.0 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3	3.0	3.0 3	.0	3.0	3.0	3.0	3.0	3.0	3.0	<u>3.0</u>	3.0	3.0
20	3.0 3.0 3.	0 3.0 3.0	3.0	3.0 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3	.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25	oonaan oonaan ah waa	anananan ang ang ang ang ang ang ang ang	កាលាកើឡោមអា	nterugeneinen	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3	.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28	antreas Antribugge Antribu	and a state of the	andightangd w	ataggeoph), a chamming	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3	.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30	In a constant on the second	terenterin frædesforjugene.	energesered	Protection and the second	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3	.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32	anterigeneiten gebrunge		ni anata	andratanan.	, 4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0 3	.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
34	- nanananan jamanan	namatina and the	alto fauge voor	anan marana a	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0 3	.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
_36	angpriniperundumment o ·	an a	mmmiaraa	inoinquadron	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5 3	.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
38	. 1400 - autombor construction	ano maio Calinationa	understation of the	aanggiyado aa kana sag	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5 3	.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
39	tantip ann an Tagtaine th	a and a state of the second	Tanibabar Tanibabar Tanibabar	raditie-attractativited	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0	4.0 3	.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
40	արու ընտանչությունը, որը։	ຒຑຎ຺ຎຏຎຏຬຎຏຒຎຎຎ	entrangetur.	ongovo orogonijem	5.5	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0	4.0 4	.0	4.0 ·	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5
41	te alla antistitutantata "apat	iller inföllar i an jar af and a	annaaged-	209.77229.47.00-0-0-3	5.5	5.5	5.5	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.0	4.0 4	.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
42	Interimeterenterenterenterenterenterenterenter	adin navny solau	antitus Projectitina e	n fara a an	na an in nais h	n tal the state of	ananguna <u>m</u>	19-03-19-07-0021	al-subseque	រប់ផ្កោយផ្កោលប្រ	ություն։	nui nii eine	n-1850220	orua aper	Boionaltae	othurnuti	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	1.0	4.0 4	.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
43	anna comhrainnaitheadh	an have a state of the state	. In galaxies	or and the other	ete catacolitit	and groups	NADA AN		prosessing.	attantin vatta	there was a sub-	tuate-ar	ono infloritan	rue abri	lin gu ga r	Trugture	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	1.5	4.0 4	.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
44	արտ մեն կարում են թայուն։	ennerangeathreatha	កម្នាន <u>ចាកការក</u> ព	្រាប,ការ នាំងសង្កដង្កា លផ្ទ	al mangaging	ព្រុស្ត្រភាពស្រុកថ្ម	aua-cu-nai	angan ampa	1) (Kangana	Cuntimutur	in the state of th	արհայն։	സ്വന്ത്രം	สมองสมพ		alon and the	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	1.5	4.5 4	.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0
45	Laptanaijikanikaan'n'''	- and the second second	artistikasi		an <u>naga</u> tum	19.000.000.000	nacionadan	Secondation		ann anna	en gegenettes	tantelli (1	an star and a star		i Margana	genatur	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	1.5	4.5 4	.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
46	- anno pannako minjeo omino	an an and and an a state of a	100.007 1005.000.000	o o deferma tion eteration	ozar antegata	da ostantististatura	an the counter		To Andalgo Ath	matemat	202001 10-012	an ou nge ra	w.co.+2200			manuanat	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	1.5	4.5 4	.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
47	ananaranandarandaran.	nshad wasaanaan	an manuta m	90.61 contractions	and and a	nimorma	ntunditang		en superna	Transmuor	Genninger	mannan.	uninghau	tela dan	ageosáta	nteramere Alexandere	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0 :	5.0	5.0 5	.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
48	a jaarootekkateootekekkeene egin	ultura ta <u>unn</u> a Menseu	ant and a state of the second state of the sec		aperover the second	nut <u>un lund</u> e	and the state of the	Papting on	7-10100-ma	1999 Martin Ba	and an and a state	anton states	naniana	an marit		Allocation.	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0 5	.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5
49	hours on a second second second	and the state of the second		/*\$>*/@#92411-1_\$%	Gt stanov	and the second	10010-0-0			Yusanyag	ortraingtone or	vasadars.A	phonese and the	ant <u>ar</u> anantar	an strattare	maranan	10-1-00 0 000	e-ionalien	a ward and a start of the start	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0 5	.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
50		sto an egyptica de tabales ma	a-mijindamedi	posarontanoisante	uproterregero		and market	<i>wanan</i> as	sciontituur	10 anotae	Do <i>lateanna</i>	and and and a second	undanist.	alle aller	n di ministra					5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5 5	.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
51	work material and a second		an a	pythone and	in touting	anter a contra	nas raideas	o o comane	w.m.	maning	ip atataba	999-997-0 <u>7</u> -02	anting where	nangara n	യയല്ന	tuding al	ingtrace-up	112-110-10-1	rana-a.u.i	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5 5	.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0
52	amanan katapatén serang	niente scatalineenda	inggreen gkryt	ពីរដំរូវនៅនៅសំហាងទំនាំ	n o rtik on efis	പഞ്ഞാപത്ത	บบเทลสมจะ	Interational	อนน์แหลองเ	ine file finde al f	tra nuga	കുള്ളംന്നും	anite Gitt e D	- Depineero	സ്ക്രാം	ange ang	ao man	90016000	14079-1442066	NO-LOOK	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5 5	.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
53	- to report autopart of the Party	. Tang sali dalaraka	anaratan teang	annaadir garadda	and the second	10000000.get	ra dualla an	a manual		transition that	IPINAR GAR	ature Su	al an	70, 10 1 00 - 100	ar and a state of the state of		nanan an a				6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	5.0 6	.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
54	errena errakolaranan eterer (arrita)								Q				2010-0	Termitica	an anna an	in çoord ana	angara-	10_0300.00+10	and	1 waardaan in	annin 18	6.5	6.5	6.5	6.5	6.0	6.0	6.0	5.0	5.0 6	.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5
55	ne and a constant of the second	Note:	If in	adiated	l sta	inles	ss st	eel r	ods	are	pres	sent	- Referen	وي معروره	maina		an the second		y ntonnuu	Susanud	tentadore	6.5	6.5	6.5	6.5	6.5	6.5	6.5	5.5	5.5 6	.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
56	angert from the state of the	in the	e re	constitu	ited	fue	el a	asser	nbly	, a	ıdd	an	anto	anstance			n Nutsititi an	ier (Been (De	anternetter.	manghaby	and the game	7.0	7.0	7.0	6.5	6.5	6.5	6.5	5.5	5.5 6	.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0
57	anguro mga managa	additic	onal y	ear of o	cooli	ing t	ime.						78000	nn-pun	an <u>as</u> mer	a di strate	generation	nauthan	raman tan	-0-10-10-10-10-10-10-10-10-10-10-10-10-1	noment	an watan	-	7.0	7.0	7.0	7.0	7.0	7.0	5.5 6	.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
58	atina creatingenaria tautan	tunginingramphian	and the second second	ngyogymatter offit	ot under cardio	5 11 17 17 17 17 17 17 17	to the company	1000 (500 100 H	No. Coloring and No.	angen repres	The second second second second	ation terrat	 >10000000	apronuch	nut interio	a de munada	ay manugar a	de annoure	a annain an t	a arange ang pa	- Para Chao	n and a state of the	listeropriteitur,	7.5	7.5	7.5	7.0	7.0	7.0	7.0 7	.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5
59	and the second	antinensempty-magning	gutaanaanab	1. and a constant of the	eanntaire	10000000000	w w <u>u</u> dan	angenan.	بيد محتوم	ងឆ្កាតបណ្ដាលិ	egogogoggggg	որդրություն	ரைவதாகு	ം ചെ	anata a	nationast	Turrati finația	>@>b+b+u4@	nimistoiau					7.5	7.5	7.5	7.5	7.5	7.5	7.5 7	.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	7.0
60	Aletan merinian reported	ah ingga ng	paring a state of the second	informa <u>nd</u> intervente	araan aaboo	and a second	dir textor	rithau to variate	and an alphabet	attoriate anot	as e rana n	tagas-au	anawaana	an a	agaaga	adaprovi g	annan an a		umánaa	atvension	inger and		ana	8.0	8.0	8.0	7.5	7.5	7.5	7.5 7	.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0
61	ellaranannaga sandaran	a and a second	ga, sagart	an coange an	all a subsection of the subsec	entige testi	parasira	t statigetown	იძლიაკიი	maalaanag	paperstatut	allan ang ang ang ang ang ang ang ang ang a	n ga gan ya	9900-100	-	<u>111</u> 71	201000	digazomini	terteor -e giya	normalia	Bernan (Ba	the second second	guageanat,	8.5	8.0	8.0	8.0	8.0	3.0	8.0 8	.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
62													÷		:					2				8.5	8.5	8.5	8.5	8.5	3.5	8.0 8	.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5

Table P.2-9

PWR Fuel Qualification Table for Zone 4 Fuel with 1.3 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/o CCs)

(M	linimum	required	years of	f cool	ling 1	time af	fter	reactor	core d	lisch	arge)	

GWD/ MTU 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.0 4.1 4.2 4.3 4.4 4.5 4.6 4.7 4 10 3.0 <td< th=""><th>4.9 5.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0</th></td<>	4.9 5.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0
10 3.	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0
15 3.0 3.	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0
20 3.	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0
25 Under Under Grand Andrew Control Co) 3.0 3.0) 3.0 3.0
	3.0 3.0
30) 3.0 3.0
32 4.5 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5	5 3.5 3.5
34 4.5 4.5 4.5 4.5 4.5 4.5 4.4 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	3.5 3.5
36) 4.0 4.0
38 5.5 5.5 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0) 4.0 4.0
39 6.0 5.5 5.5 5.5 5.0 5.0 5.0 5.0 5.0 5.0 5	4.0 4.0
40	; 4.5 4.5
41	, 4.5 4.5
42 manufacture addresses of the second addresses of th	4.5 4.5
43 house a submitted and a sub	, 4.5 4.5
44 reservices were an interview and a service and a servic	5.0 5.0
45	5.0 5.0
46 (approximate and approximate and approximate and approximate and approximate approximat	1 5.0 5.0
47 Attraction from the from th	5.5 5.5
	5.5 5.5
	6.0 5.5
	0.0 0.0
	6.0 0.0
	6.5 0.5
54 Nates 16 implication and and and ano process in the process in	70.30.3
Note: If irradiated statifiess steel rods are present $0.0 \ 0.$	7.07.0
$\frac{33}{56} = \frac{35}{65} = \frac{35}{85} = 35$	7.0 7.0
40 minute additional year of cooling time, for cooling times	80 80
57 pathods and a state of the	80 80
	85 85
	9.0 9.0
	9.5 9.5
62 62	010.010.0



PWR Fuel Qualification Table for Zone 1 Fuel with 1.7 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/ CCs)

(Minimum required years of cooling time after reactor core disch	arge)	
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Burn															٨	laxi	mur	n A	sser	mbl	y Ai	/era	ge	Initi	al U	-23	5 Er	nrict	nme	ent, v	wt. S	%													
GWD/ MTU	0.7	0.8	0.9	1.0	1.1	1.2	2 1.	3 1	.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	3.0	3.0	3.0	3.0	3.0	3.0) 3.	0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	30	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3.0	3.0	3.0	3.0	3.0	3 3.	0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.0	3.0	3.0	3.0	3.0	3.	0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25			_1	.1		- 1			_	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28	1002-1010	1 TRANSPORT	10019101070	ia utros nort	ຸ່	1999 - 1999 -	300 0 40 m 194	(COLO 100)	BOULD -	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30	0000000	100-010-00	topoganet. A			den gover	alle and a second	8.4.0340 0 0	alland, -	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32	- 90 GI GU	dan da an			anne -		100 P 102503 0	00000000		3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
34				,	ni internet					3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
36	L	to regar or		unantitue.						4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
38		-Onvine (5-man.exte	1 0000000000	an a name	himorra			anona -	4.5	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0
39	Jungton.		tion of the lot	The case.	in distantion	all anticase	and the section	weren nord	ndunuti	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
40	vite of gales	-1010100	aurowag		The second			1.11.1.11.11.11.11.11.11.11.11.11.11.11	ung ur	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
41	anter de la maine	anaztrota	atterative	-thangs day		aller and the	anover 1940			5.0	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
42	1000000	umpere	nuomo	ກວາມກາງຫຼ	aaiwaaa	MARINA	-	emmunum		up Up	1993La Monu	an Harrigan Ian		ganana	Chippen to a	เต็มทีมระสม	ինահունին։	ile-uffagutd	-amente	ննիներությ	สัยหองของ	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
43	tipe and a	an a	n.mr.max	المحادثة المراد	alangge as	al glassifica	gerrooph	a townia,	toaprigr	1.2 Martin	ana ana	1. marana	more we	a a como par	an an an an an	<i>wirw</i> a	araastan.		angereg.		1. jugi (1.	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5
44	նյուներ	nteromona	անտուրը	สถายๆคณ	ina tho tha	คณะอยันคง	an na mana	ព្រះព្រហាប	ามายองคา	1441100900	nungiaan	underigi.	BALLER (1)-11 (noruantur	902140.2394	maaa	այնանորեն	ารสถานการ	nounot	- คอมมาเกิด	ະບຸກສາຍາ	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
45	anto anto	and and the second second	RI PALYNDAU	Sector data	قىيلىردادىيەت	യംഷ്യങ്ങ	2007771000	n'athara	ta an	unothere e		wateraar	e áze).		ante antan	ganta ti natio	Evensets	nine sa sana	antoine	tomatica d	armota	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
46	an too	10 (Jistator	ana ang ang ang ang ang ang ang ang ang	aan noon	ເອັນການພາກສາ	7 174 analogo	ശാമ്പംപ്രം	ioniaa nad	ງງານງາ-ເລແ	eutige, invit	0	15 glas vite (a	มมารถมายณ์ มมารถมายณ์	10.4832524	avaamaaa	ഗനാംത്രം	b Side of the second	Maanada	anno nng a	eaturaia	pullidmind	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
47	attanta	ույթ։չըսը	an man	umou <u>n</u> o	പത്രമംബ •	arijura.a	dam, e qu	ann ann	ngaa ang	gen ourod	ara arad	an an an an	ngar-aug.	- Andrews	1. The second s	aproten tia a	an ang sar	ത്രംസ്മാം	nssage-10	manara	s transmat	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
48	Baripala	TIDEO TANG	afreiðlansar	alifiya mikal	err restar	Wenterne	enotio car	io chatana	1016m0101	un mann	n an	unuto decedi 4	a and the second second	aliyon da von que		10-100 APril 10-10	anatar (the	mmutric	ar a nutile of the	aromin	wettens	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0
49	ann ann	~~~~~	u z ineezi	(Closed Close	attanen.	amorate.	nga cango	bu-mghr	ry-aaro	n angaga	wass and	menninge	tan secondary	oonn ma	UGD-AMA	ლიიფელი	autopason.	n fill a rufar	متيسمحة		കേരംത്ത	Manan	ngage seasons	Stated to Sector	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
50	200 m Barrie	anna sand	apanara.	M	automing	siler-term	gournan	ieren i Auson	andfaora	(prinompol	nanstangu	tasputtores	enternant	<u>lon</u> ngatan	n and the second	onormu		to the state of the	andrage de co	un fa sta r	• .				5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
51	prostativa	lifang tafaf	novan-tana	oordar da	avaiyint	aquar ne	an gran		o un tro- C ri	டி <i>ற்ற</i> ன்	0-000 <u>07-1</u> -1	ಮ್ಮಾರ್ಯವನ್ನ	ta manata ang	ബഹ്മം സ	annanna	angeranu	an anna	34-422-427	weenus	uter the second	المستحدثان	BGUTTOR 4	Ingitivation	ali na mata	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
52	warm	anne cuttar	anajaman	noneant	ութունվու	10000-0×	וריימו	na miteraturu	headan	no talenn	01124813220	ingutation of		പത്താംഹം	ישאטיישאי	uutathimet	ແມນກີ່ມາ	eetapo etus	ഷ്ണമാരം	യസ്വനം	annan an a'	invanativit.	ചവാപത്ത	יובוניומוינות	mmuent	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5
53	an a	ng tap	antagar a		Linna			niza ang sa	tarea.co	. an and a second	a to the second	Maria	an a	an name	un an	maattaa	an a	ේන්තිකාංගි	s an an an	aranta	unindu	na si n	,			3.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
55	una 106 m	uto 10010 a 2 0	1.0.000 AL	No	tat	If :				atai				da				-aw	a de la come	ushtouwa	puntinga	angagaikaan	magno aga	an an an an	antara ana ang	utantini	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
55	antinanta	narantir.	an ser ser at	in	ne: +b.		irra	urat not	.eu	star	fue	SS SL		ous	are	pre ad	sent	ayaaya	000/024000	vanaaria.	arin uza	agai anan	energen in	an a	1900 - 12 1 00	eta a casta	3.3	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0
57	A COMPANY OF C	ອຍການສະຫຼະຫຼ	2059.000	ni ad	un ditic	5 I 1 5	eco	insu vr o	nui f or		iut na t	ima	1550	nor	у,	auu	an	nym	ม่างเหต	radizzin	ซึ่งเหตุกัญ ดู «	110-00044000	United States	11111.00000.00	an un a mate	ennon na	0.0	0.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
58	ananan an		10-124200	au	anne	ла	yea	u O	1 00	Join	ng t	nne.	•					transa	nandita sept	anghang di	niform e-m	1-0500 an	അദിയത	namenna.	an da a an	ar ar ar		inonational.	6.5	6.0	6.0	6.0	6.0	6.0	6.0	5.5	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
50	munstrat	onoguangi	-สของเสรีย	ሳሳት የሚያ	an Cond	roont or	Continue -	Tyrafi 1970au	no fino antos	nin din di via	abofi litit	(ageneration)	nalitite a	nganan a a	tan'n anni	stadio Te a	Intria cont	and and and	an againt	actrations.	200 C C C C C C C C C C C C C C C C C C	concetter	tip waaran	tuttigans - Esri	9007000 <u>0</u> 00	an water with a	ikanon baanoo	ann dimti	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5
60	ngaran d	turo roma	n <u>ur</u> oonint	യാനത്ത്ര	anina a	aff_frontellag	(970) og 1	-90-91D	04242-101	inno antar	angganga	anaው	. Baartaar	part-rogo	ngangraus	Յաթույն	konnter on o	առարութ	endan an	ntofh <u>ailt</u> a	and and a	. theorem and a	an dia ta	ումատմում	ana (515-116.0	antennette	1000500061	ingen der ferste	6.5	65	6.5	65	65	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
61	maanatime	-1	ngerspanser	e nontrontio e	aren daved -	jed visitoritpo	illandiron	tynugbia	truerun.	(010)-040144	ιμοτριτον <u>ία</u>	nuraradi <u>a</u> s	10 allostal	Manaham		(สมายังสาวจรู	n áth an tion u	na tha that a second	r anso nati	ana (Alifert Cal	იიიით	fgermanike	.a.Garago	99-00-000	urratur		avaa riindin	andranated.	70	70	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0
62	22002	uteranda		and a start of	100 COMP.	and and a state of the	monac	and and and a second	attano e a	INTE CONSTRU		tinetti ettin	angerion	2000 Jaho San	(Januaria)	1466 - PAR 1988	C. C	კ ორიშთ ი	. and the second se	iner fastat	nanuraa	(ggragrad	ngt chynger	aline all the	იარიატიდ	y Ya		in an	70	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	65	65	65	65	65	6.5
62	L																										~		1.0	1.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5

Note: Page P.2-34 provides the explanatory notes and limitations regarding the use of this table.

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Table P.2-11 PWR Fuel Qualification Table for Zone 2 Fuel with 2.0 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/ CCs)

(Minimum required years of cooling time after reactor core discharge)

Burn														M	laxii	mur	n A	sser	mbl	y Av	/era	ige	Initi	al U	-23	5 Ei	nricl	hme	ent, v	∧t. ?	6													
GWD/ MTU	0.7	0.8	3 0.9	9 1.0) 1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	3.0	3.	0 3.	0 3.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
15	3.0	3.0	0 3.	0 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.0	0 3.	0 3.	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25					-				3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28	0.04000	(Chimeda)	s-mmpro	an na Garan	anorin alono	NALID PARTIN		umo anos	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30	a de la casa		maa affina			-260101010J	gundana.	w.C.C.Cab	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32				100200-000	Weisstein F.	,		the or of the line of the	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
34							-Canvard	a www.eato	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
36							ilina ili		3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
38	1000000	700/7020						10.00000000000000000000000000000000000	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
39									3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
40	191071-07		าร์มาเคม	siddie cheramona	nt o and and	th the universe			4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
41		the interfer		ery planny	mominer	Contract of the		n-1.640.177	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
42	United	- (a n tin)	1000000000	Diotas	1.1124.004122231	AND COLORADO	- 	anaanaa	പഞ്ഞിരുന്ന	т.	muuniner		ane obrano	o manara	ເສຍນາກາະສ	1054.01-0601	00.00LU (T) (C)			1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
43	grage gr		9.079.07.07d	interesting of	Temputes	uture texture	domanations	igouteen	an same	a'n staat gesta	un bairm		untur again	-register and	-turnet de la la	a ngapan		Constantion	ntanan	antestera	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0
44	ւսերու	1.1022070	angere ang	ພາກອາດາ	1.000th-000	and and a state of the literation of the	100-0-0000	manin	111111	ย่องสายา	m-organ-og		រឲ្យវាយិតផ្លេស	1.12010-111071	-0.010020040	1000 11224014	Nanana	ດມາສາສາການ	muqura		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
45	purra	ر. مردون و	بواستون شنتك	gerada pres	ວວາເສຍາແປນ	digramation of the	montgate	active and the	rico-organyary	Name and a state	•		-u-angor	portan rug	provention and	no-upony	and the state of the	(Vordinate at	wagu-o-	nonpoggagg	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
46	11401050	ლ.კეფით		Stort Burner	anaonee aa	utigina n tyra	amwanga	activettose	vo.1.0000			umpupu	(integration)		1-1-01-1804.00 ⁰ 1	termine	Romman	ourogetreir	antoncian in	state rise dire	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
47	gironta-i	2:0.0a	athat-ajaan	വസ്താം	a-omporto-a	ana-coa	ana mata	a angia a a	ana ang tang	nussecon		antantate	autolentrati	and the second s	angungb)n	an Dala Data ana	տուգրունը	n subabup	ionteo en	1000000001	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
48	1-0000	2.1 00 7009 U	atungu	the second			the counter	10003. updud	to outouting	იიკიდიით	1010 yana ya		1 Carthorn	angan ang ang ang ang ang ang ang ang an		(11-11-0-000)	1000070	Tressantano	ng gate stor	- an exponent	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
49	2059644	an a	an Tarata	entre mat	ing and a strategy of the	differences	The contraction	n ang ang ang ang ang ang ang ang ang an	Pir-ces tairig	na attau	al an	antanan an	dis Francinose	وبرو روشتان	(and a constraint)	Produce state	u Cargonadas	and the second	antastat	u e fotoriotte	ange an	Fridmitthe	where there	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5
50	transto	anna ann a	mperiodia	og utrata con	n data ranan		ijn en strange	unero otaro		autrus (junt)	a nitanana		· · · · · · · · · · · · · · · · · · ·	oonoon ve	tres disatstan	ation of the state	1800-100u u	.d.oronta-cocord	ntruciesa	aatteration		ww.mour		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
51	a- a ra	diran-us.	tazut-os	Language and the	20120.000	an a	arnaga via	dington alla the	10.7 <i>1.1100</i> 00 ,	ananani	communes	nie sofiniere	tana ang	the courts	titanininin	to donad	findelprised	d goologgaap.	120000000000000000000000000000000000000	nyaarstas	The second s	untanto Apr.	angana ng	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
52	untuto	1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	มหน่นเหนต	and the second	manatrama	an a	n go e da an	ningana m	មេលាលអ្នកសា	an a	110 MM 1-12	Internitente	niommo		1970 Dalayo	עיייניווונווו	រឲ្យផលកាយ	មើរប្រាណារូប	allitearinit.	anonung	an paratana	ланнацыя	յա կարություն	ուցի ունինների	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
53	stange.	2012.124	ntutterid	Mantoonde	• • • • • • • • • •	at the second	1 122-1444444	n wangera	ann an cuma	nentrusse.	้สระบบการ	n - rupaaa	llansous	a and the second se	destro que	Postero Maria		itinus ritu:	r Eintestesder	ana,aantaa	 	0120-117-11 1	Matadatasa:	.00.0000.0 <u>0</u> ,	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
54	สุขรายม	(megalina	mièrque	· · · ·				<u></u>	<u></u>	<u></u>			· · · · ·		<u>`</u>		ine	aramanse	ແມ່ນເຊັ່ງແຜ	provincent.	upilitan 194		anna an	1 aggangoli		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0
55	or inter	Manatar	water	N	ote:	If in	radi	ated	sta	inles	ss st	eel	rods	are	pre	sent	3 12 14 12	vase and	hanaan	aymentus	an dan	r altradent	anon page of	m <u>ulu</u> nyo	noon or	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
56	สหรัดง เร	den strad		in	th	e re	econ	stitu	ted	fue	el a	asser	mbly	/, 2	add	an	yanta	group the start	. Manananan	anaan wa	na utanan	sharaattaa	1000000000	nanions	noranana) na	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5
57	alamaa	anaple o		ac	lditio	onal	year	ofc	cooli	ng t	time	•					ano:	nasiachotare	, Marunan Maru	runducare	apanata	man	oni-nanimus (no	atentatura.	unternate	anterioran	e materiala.	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
58	yn curyn	aniaany	an a nto mar	odoženeto.	tare autorette	eriezipizitat	utermente	an n atifactio nel	rmidan (iku	v outer to	n an tan Br	nsaw	ინენი იფი	n-y <u>the</u> anatu	protasion	attanta -	unapriore	untality de a	ultato ato dat	എന്നെത്രനാജ		eren and and a second	athadam	n (Magina a	0100 <u>000000000</u> 000000000000000000000000	arjuta ondari	ი ფიია ი იფე	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
59	-mang-a	nan gan	- 	u ann an	ai commo	0 1.070000000000000000000000000000000000	un materi	romana	anteria en	dummumum	enanthau	6600-110040	Onemout	opinanai)a	ranget-cert	aumenan B	ertan esta	anoonsafe		and the first of the second	napatan	actualer	e infinition	an a	ng thitea	-JOGODO TEO	mananga	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
60	ugge a	002070 (BOU	or a III source	vala Gunnad	ფიაიფიეი	Androadacha	hattle windt	anevative too	terton theory	hamany	nasannak	upretaryoue	tin an	unaport	annea ann	patrimontilio	uatarara	Ladonation of		utulatiyo (atir	un terg and a	Igranoffician	ts dampatyn	n an	anna sóraí	aon gona an a	1999 tan 112 110	6.0	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
61	anteres.		in million and		tuniteri-turi	alle rupulo du	a r <i>-an</i> r-ar-a	an and a sub-	contamation	n gangeng	angestime	Annalorat	analar and	no tra an	2-auto-das	nan san san san san san san san san san		er and and	National	1100.000 <u>0</u>	<u>britoria</u>	angalang ng	annaith a	anifating start of	anen frants	ആയം. തു	n an an an an	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
62																				2					•			6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5



Table P.2-12PWR Fuel Qualification Table for Zone 3 Fuel with 1.5 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/ CCs)

(Minimum required years of cooling time after reactor core discharge)

Burn													M	axir	nun	n A	ssei	nbl	y A۱	/era	ige	Initi	al U	-23	5 En	nrich	nme	nt, v	wt. %	6													
GWD/	0.7 0.8	0.9	1.0 1	.1	1.2 1	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	3030	3.0	303		303	20	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	30	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	20	20	20	20	2.0	20	20	20	20	20	2.0	20	20	20	20	20	201		2.0
15	3030	3.0	303		3.0 3	20	3.0 3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.U 2.0	3.0	3.0 3	201	<u>3.0</u> 2.0
20	3030	3.0	303		3.0 3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
25		10.0	0.0 10				3. C	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
28	างเหตุกฎร์การสุดสุดชุม 1	nuale quar	in a aire ann an tha	anneage A	ບສະບຸດອານາທ	นาแม่หม่า	nanana	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30	thong righted	teren serien -	สมส <i>มมาณ์</i> ร	late lever y	orichiagous	ويلاء ميليون	şanındağı V	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	30	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32	av suite annaith	antes entre en Entre entre	an writh	ເຫຼົ່າໜ້າທີ່ ລະ	ໝາະລັບເວັນ.	ົ້ນໝາງເຜົ່າຈ	aanta 2/2	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
34	timene v Linnensky	نيدهاد عذيΩينية ت	ang san ang san San san san san san san san san san san s	tentinet Sectored	structure.	ang ng ng n	inner var	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
36	ananggan o mandropingin	ateria reali	2. เริ่มมีสุดไม่ ค	1960,000 P	പറ്റെ ത്രോ	announia , , ,	unanini u	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
38	Athaca a anna a a	include o	lan na sang	, igenand:	dung den en	utan <i>in</i> tan		5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
39	Configuration (Second Second	หลังไปรัณย์ไป	f wranadwrada	agunaig T	ina kana kana kana kana kana kana kana k	<u>niorny</u> fin	andinene +	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5
40	anna agustatas a	10000000	oringitating	สมัญญาติเส	anterna de las		andere)	5.5	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4:0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
41		uninerentin er	Constanting in the	040434443	unite uniter.	ngatum	n i Antorio est	5.5	5.5	5.5	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
42	an ar gaige san a'	U.Journe J.J.				agadan	NORTHER .						1		10	۲ <u>,</u> ۲			5.8	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
43	1. 	. 3 . 3		taintanu taintanu	สถุกสารเลื่อง	underin	onen en	میں		ំ កំពុំពិនាធិតុចកំ ពុំព្រៃពិភូមិចក់	- The second	geotometeo	- 	ann ceile ann ceile	លាលាម្នាញ	1			and in the second	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
44		e canadra nacio				anna a'	-o-Annar					- <u>San</u> si		para con	anne		anan an	. An pairs	یدیدی، دیکھ • • •	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0
45	an the second	· · · ·				nedation of		ana ann	un na stario	an gaoron Storais con	on and the second	ing to other	ang at sa	ni Ni National Anna Anna Anna Anna Anna Anna Anna A	n a mai	antikora (61.00000 9.000000			5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
46			, 	miania		10100000	t :	a butter	unnintu		20100000000000000000000000000000000000	ine cananan ine cananan	 	ana	innerner i Lada esti	(Tananaan	10000.071 × 40		na igra ig 1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
47	anthrosteronarouman	idanio con	สายชื่อวายคล	wanda	monutor	en chuncheil	h stičkou	e ulateatume	ntinta destaño	within			a lotunition	anhum i a	an and an	notecter	maaahla	es atéro ani	unet: anti	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5
48	nampananana ana	u mintu	agan) (ajam	Katainan	and a state of the		ດ້ານແຜດແ	antenin (1921)	n ménimumun	ากษณีเกม	i Man waann			matter too	entere suio		Ma dama	nine antiu	าสมาชิงสาย	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
49	an and an side	وستحتقص	uniter dans	n Talintagas	nnaan			anna an	mations	a satura	ana	NGD4200	nturternauto	Samuel 13	annäudenei va	tugerates	aan saara	i irritateate	na minad	Industria	oyantano 4.,	The Maria	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
50	per an ante an organiza	ດແຫຼງແມ່ງຫຼາ	in normal submitted	i nymu p	an addana	antalitination of			ar summi	La minun	isingning	Anterest	econtri-officients	nije od jeju	ndurrubin.	anon Er	ត ស្ត្រស់ស្ថិកណី		5 - ·	^.	, e		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
51	สร้างเรือการเสียงเลยสุด			minada	aunaaa	enterenterente	Linearana	an a	n).		diana me	Antoine	n Angula dalahatatatatatatatatatatatatatatatatatat	Alama	ana an	mbainn	herenesis	และ โอยเล่ห	100.000.000	ulan ar	Santa	winne	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0
52	ານນີ້ເມຣິສມານແທງ	งการสาวสุ	ພາສອງເມລາສາຍຜູ້	nangan	an canar o	miñant	n-anim m	โครงเกมาร์สม	ការិ ភាពសេរា ពារ	entrum	um na un de	geonge	സ്ത്രകം	وموشأأس	รัฐบุญญาต	កក្តៃពាររំអូវ	ผู้มีมุกการสิงค	n n dautos se di	าขาร์นอะเบร	ներըութա	100.0000	สับธรรณเต	្រោមថមារដ្ឋារ	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
53	Kariaan haiteenatt	Maria ang ka	a ar an air	usrum <u>i</u>	aguanan da	Record internet	websies	Inseption	ana da	,, Sarata	unai nyani	สัญญาเการ์	Capitropo	Longita	มมู่ใน = ะม่	Kaji 11. okt	Liorin m). Wali mala	rinuid.co	Maring				6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5
54	totune ina Trad	lane in F	<u></u>	·	·	عي	<u></u>	12	2	<u></u>	52.	". <u>.</u> . +	÷	<u></u> .		مر ا	un profusio	é r. Baro dia	ni tamenta in	u di tana	มหาวิชากา จั	tan in names	ດເບັດສິສສໍໄດ້	utaurrheet A	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	<u>6.0</u>	5.5
55	01.242/002.0000000000	t,' Matana	Note	: 1	f irra	adia	ted	stai	nles	is st	eel 1	ods	are	pres	sent	تنتثيق	i chainne			a. Langua	, waxioo		ي. مىلىمەنلىر	ngainne t	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0 (6.0	6.0
56	e national instanting	ueenanii	in t	he	rec	ons	titu	ted	fue	el a	asser	nbl	y, a	ıdd	an	un i	Discharder	ann ach	un datas es	Surruwerne	Martin Mar	enserinseen		(wataro	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	5.0	6.0
57	lantar Latania	الدر مرتك	addi	tion	al ye	ear o	ofc	ooli	ng ti	ime.						in.	ir nadad	nnie z r	కడుల్లో ఇరిగా	ഗ്രാത്തിച്ച	Norean	ninatjuon	andream and an	naknut	เมืองหุ่มม	hersterar	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5 (5.5	6.5
58	aranga' magantala	i , L	u angaran	n n n n n n n n n n n n n n n n n n n	namatika	management	ann an	a patrica a	atan managan a	winner	Lagenda Dece	e for the p	สมุณหญิต	លំខាល់ហោ	yim wata	gigas der vi	é waganie	in interesting	านูของสุขาช ราชชุม ซนูกา	ณฑา เมตุน	Natar nan	uninauquari	idupont/code	onumperi	Angenania	introductors	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	5.5	6.5
59	s nicht fram an a	yo maana	e inadia	19231-223	nonnorg	anterany.	; uudanese	niaintitya	nen moor	unaangi	upanaan	in tinui	latertaria.	Manahari	Leitiju i	annainn:	annadari.	manar	ດຕ່າງແລະເວລີ		Śdatiwa	Kelodicidan	anime ritan	stattičnu:	mpupations	der on ange	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
60	a nagrae "no gaptation uto	Le coiseus	กล้าสสมบาล เ	สี่เหลาะกลุ่ก็จ	orroni de la compansa	ana ana		inanan in	manini in the second	าริแต่สตร์	internet	Annanies	anith to the set	(Baulana)	al haiza y	e nation o	anginu	Marinan	เกิดญัติและ	. anticadada	anahaan	Southers	naatanifisma	r r r	ijožarbani	ayatanida.	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0
61	าสาราวีสาราวิทยาลา	u consta			manainna	naranjo		Marina di Sana di Sana Sana di Sana di	n an ain air	ijanatora vi	an dia a	unaint and	proversiona	naso cont	apatana	rondonte	annan na	a una varia	, i vit. Natariya	aganok	mmin	arnijata	n nàn an	iintanan	nin antinair	termenter	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
62					1913 z		1					See .	ر نوان مرتقع	. <u>``</u> ```	·	-						1.1.3*	ه رو به مدهد ه	5 2	and and a second se		9.0	8.5	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5



 Table P.2-13

 PWR Fuel Qualification Table for Zone 4 Fuel with 1.3 kW per Assembly for the NUHOMS[®]-24PTH DSC (Fuel w/ CCs)

(Minimum required years of cooling time after reactor core discharge)

Burn															N	laxi	mur	n A	sse	mbl	y Av	/era	ige	Initi	al U	-23	5 Er	nrich	nme	nt, v	wt. %	6	_												
GWD/	0.7	0.	3 0.	9 1.	0 1.	1	1.2 1	.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
10	2 0	2	12	12	0 2				20	20	20	20	20	20	20	2.0	20	2.0	20	2.0	2.0	20	20	20	20	20	2.0	2.0	2.0	20	20	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0				
15	3.0 2 n	3.0	$\frac{1}{2}$	13	03.			2.0	3.0	3.0	20	20	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	13.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
20	3.0	3.	13.	13	0 3			2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	3:0
25	0.0	10.0	15.	5 0.	0 5.		<u> [</u>	.01	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
28	Tago tagang	oner din	anne ann a'	(97)202 (97)202	annanan	q uan na	Manta da mana d	ານາປັດໜ້າ	munin.	3.5	3.5	3.5	3.5	35	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
30	jann drift	ana refer	n 2027 ti orđijan	uninio.	agentie ale	rā Parizeā	Ivonstatut	aliyatiya B	nondori a	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	35	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
32	ndouroth	burgera	alaatu vasti		ngingananan	11172.005	and descent	সাৎ হয়েই	-gernelign'	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
34	redition (13)	00 D 100000	etati kilaj		u lli lijing	-23-10 5 -	nganagora _a st	ang	225-05-12-1	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
36	2020.00100	rata atri		atti nga atti	n da al fan met	ing ongoinge he	unthaise and		7au 179. P	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
38	s de refilta e	n <u>teor</u> eog	ionarian	iteopata	najara Grafia	1940-0000	a mat hayaa	unne arter	uporituo	5.5	5.5	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
39	an protection	519,01/14	แหน่งเห็นข	nunnunda	ju li nation	010400	Q. 994978974	សេវាភូមិក	W. C.L.	6.0	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
40	buertann	Quine a	1.2.201920		allo-anatorio a	nagaga	Voltando dat	1.000 A.	titus and	6.0	6.0	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
41						antiatro.	gern angegang		uto denne ot	6.5	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
42	2 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0							5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5																				
43	20.00		. acemania		#10/11/2010	namut				Darm out				di mangana di sana di s						nitionalia	-	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	4.5
44	paper	pinnun.	194600-0101	www.unou	nautane	referitet u els	ith site in site		minnun	undet bei eine	natalanos	mation		attrature of	urean dana	ດ			anano mu	LILLI GENERAL	in and the second second	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
45	200.000		ميريونهم		anter de la	nonaga	*****				and set of the set		n an	entra an	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		ta Andrahata	Discentique	anter			5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
46	brguina	nbideqea	nania dia dia dia dia dia dia dia dia dia d		a can ta ta ta ta	mound	000 000 UU	Harmon	al minage a	utoventiene	ganna an	anandatar 3	101000000			alle s georges	ando antaio	-	antopage	The decoupt	and the second	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	5.0
47	dintare	- milara	in the second	ananga Balanga	uîzru Geta	1979, Infla	an loanna	and the second	thorn the second se	a-manualit		Martin Log	-teup: 20);	inunininte	in-the fol	an sound	oringu Loin	Parathala	ութաները		Muthianim	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
48	Secto Amond	D ULLING	mandboolgg	star an	antropost.	ALL DATE OF THE OWNER OF THE OWNE	avera (Britan	wagter	ogustanea	anganan Banan	to gage or	unger Arregele;	no-data v			nvagaude	o (generation	montan	manand		ina in aireann an airea	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
49	n nation The second se	genist co		montan	abarrada	an a	nggagar-ang	unitation of the second se	anterentario.	allenere and a	ക്കുന്നതും.എത	nananana.	குருக்குல், ப	and State State	ilimente da	uu uu ah	and the second	n Igiulaang	anningettig	đ an ting 75	a hoosena	antan	n an	ander Janes	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
50	survey	000 <i>0500</i> 0	procession	Mantana	nga inggan	(meno (gio	(alloranae) (16	igendense	ata annos	and the second second	140-1401-001	and the second second	tronation of	an darren	darangeta	genouring	nluration	P-10101000	an a	uhauna.e	23				7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
51	,eren e ren	n antan at	6. Carlor		n y tymiliadig	v-treba-the	11.1.10	gan gan a	n gandag	be-dellarens	ananana a	ringan-afradi	Baran mu	Cardina Marie	af 1-enumbr	ruserpitte	ueletter of m	hallanda olgo	ilgitaaturint	an Marton	ann-ar a	იქვილი	un-terce ong	212 <i>10-12</i> 201	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.0	6.0
52	(onthes)	1,000 thay	កផ្សារព្រះ	1-A-107154	മന്വേഷ	Dept ion	nineitenette	aphonar	յուլուտ	որորություն	1991-050715	-ingthtang	herrotan	unitationa	anewandura	anna arb	natuamaa		ֆաստումս	na ann an	<u>קו</u> אד ו ונויצוינ	ימינומי	10000000000	ൻബിലാന	agmoann	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
53	s" restants	a	Nagarica.															2-10	10120 <i>~</i> 1207	nurur Car	antan an	Barran and a star	D C			7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5	6.5
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55	90900aa	tanto consta	energy and	i i	ı tl	he	rec	ons	titu	ted.	fue	el a	asse	mbl	у, :	add _.	an	En c	de contacta	maine	dercauron	ngran franc	androw	entertinge	ağışarmı	rundelije je oante	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.0
50	r-teoperate	o.controler	a ang ang ang ang ang ang ang ang ang an		ddit	ion	al y	ear	of	cool	ıng	tim	e, fo	or co	oolir	ig ti	mes	-anar	1.0090000	noutsuqta	onomicano	19 W. CD (D	an shundar	n prostan d	perfectively and a second	an a	8.5	8.5	8.5	8.3	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.0	8.0	1.5	1.5	1.5	1.5	1.5
5/	(no q'Erqje	ւթւնոնու	name and		ess t	han	110	yea	rs.									2401	enstander		aturo oraște	bendigethe	acompana	1999-1927-0		lechrituliete	faritaerstiler	anomene	9.0	9.0	9.0	ð.5	8.3	8.3 0.0	8.5	8.3 0.0	8.5	8.5	8.0	8.0	ð.U	8.0	8.0	8.0	8.0
58	·	ntrea t ea	7007 <i>5</i> 70	naguna a	ananana a	90°.00239	anan secara da	rundug	uljavun ver	and and a state of the state of		a dagge i de	nyaya Qara	n. 940 70.94	n maynariv da	anan coss	haianaan	an a	ann sy fran B	arantaran	all control to the	a taggi ya a ta		- and the set	11:200.0 1 000	gradadigad	uotouto talee	u anna cait	9.5	9.5	9.5	9.3 10.0	9.0	9.0	9.0	9.0	9.0	8.5	8.5	8.5	8.5	8.5	8.3 0 5	8.5	8.0
59	warnte	ang mga	brucenta.	curate da e	on trat tant	Sources of the second	ana pang	enerana enerana	n ja manga	in an	general de constantes de la constantes de l	etrik w <u>teri</u>	5° a 2 a 2 a 2 a 2 a 2 a 2 a 2 a 2 a 2 a	Concentration	tornation u	n arangar	am brate	ntron tout	rian nanat	ipo <u>di</u> s es	Selondikan	pastana.	and a second	nteringer of	igna: and	na ann an	দ্যালয়ে	annene.	10.0	10.0	9.5	10.0	9.3 10.0	7.3 10.0	7.3 10.0	9.5	9.5	9.0	9.0	9.0	9.0	9.0	0.5	0.0	0.0
61								monoride	10.5	10.5	11.0	11.0	10.0	10.0	10.0	10.0	10.0	10.0	9.5	9.5	<u>9.5</u> 10.0	9.5	$\frac{9.3}{0.5}$	9.0	9.0																				
62	groups .		19 1 - 193 - 193	angona	nder ager me	nata PA	iloune in de	Druganija	Managanana	ing and a second se	tituri Talada	here and the	(Seringto	andi di se	ndr-talgetab	ແມ່ນເພື່	ann saidh	ຫຼາະບູດັ່ງເຫັນຜູ		-antannad	Sannanan	titter af sea	giunao)agen	apresentstr	in algerite wi	nya ana ang ang ang ang ang ang ang ang an	Patit Patrice	randumri V	12.0	11.5	11.0	11.0	11.5	10.3	10.5	11.0	10.3	10.0	10.0	10.0	10.0	10.0	$\frac{7.3}{10.01}$	7.3	7.3
62				~ ~					-				1.0							·					4				12.0	11.5	11.5	11.5	11.5	[1.0]	11.0	11.0	11.0	10.5	10.5	10.5	10.5	10.5	10.011	,0.0F	10.01

Notes: Tables P.2-6 through P.2-13:

- Burnup = Assembly Average burnup.
- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are correctly accounted for during fuel qualification.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an assembly average initial enrichment less than 1.5 (or less than the minimum provided above for each burnup) and greater than 5.0 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 62 GWd/MTU is unacceptable for storage.
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 3-years cooling.
- WE 15x15 PLSAs shall be limited to a minimum assembly average initial enrichment of 1.2 wt.% U-235.
- See Figure P.2-1 through Figure P.2-5 for a description of the zones.
- For reconstituted fuel assemblies with UO_2 rods and/or Zr rods or Zr pellets and/or stainless steel rods, use the assembly average equivalent enrichment to determine the minimum cooling time.
- The cooling times for damaged and intact assemblies are identical.
- *Example*: An intact fuel assembly without CCs, with a decay heat load of 1.7 kW or less, an initial enrichment of 3.65 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a 4.0 year cooling time as defined by 3.6 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) in Table P.2-6.

Assemblies (TPAs), Rod Cluster Control Assemblies (RCCAs), Axial Power Shaping Rod Assemblies (APSRAs), Orifice Rod Assemblies (ORAs), Vibration Suppression Inserts (VSIs), Neutron Source Assemblies (NSAs) and neutron sources; the 24PTH-S DSC will not store CC. For shielding purposes, the 24PTH-L bounds the 24PTH-S DSC because of the additional gamma source due to the CC. Therefore, the shielding evaluation presented herein is not performed for the 24PTH-S DSC. Based on the results of Fuel Qualification Tables described in Section P.5.2, fuel with CC requires one more year of cooling time. To assure that this evaluation is conservative, the fuel source terms are not adjusted to account for the additional decay required to accommodate the CC.

The 24PTH DSCs are also authorized to store Westinghouse 15x15 class Partial Length Shield Assemblies (PLSAs). The PLSAs are similar to regular fuel assemblies except that a portion (axial section) of the active fuel is replaced by stainless steel rods. In essence, a PLSA rod would therefore consist of a fuel section and a steel section. Fuel qualification of these PLSAs, therefore, requires that the combined source term from the irradiated active fuel and steel regions be bounded by the design basis source terms.

Dose rates are calculated for the 24PTH-L DSC within HSM-H. Dose rates are also estimated for the 24PTH-S-LC within a HSM-Model 102. As the HSM-Model 102 provides less shielding than the HSM-H, shielding estimates are not made for the 24PTH-S-LC within HSM-H as the dose rates provided bound this scenario.

The design of the OS197FC TC is identical to the design of OS197/OS197H TC except that the OS197FC TC has a modified top lid. For shielding analysis of 24PTH-S and -L DSCs, OS197FC TC is used to bound the OS197/OS197FC TC also because the design features in the TC radial direction are identical for all three TCs; and OS197FC top axial geometry bounds other TCs.

The design-basis PWR fuel source terms are derived from the bounding fuel, B&W 15x15 Mark B assembly design as described in Section P.5.2.

The NUHOMS[®]-24PTH DSCs is designed to store PWR fuel assemblies and CC with the characteristics described in Table P.2-1. The 24PTH-S/L DSCs have a maximum decay heat of 2.0 kW per assembly and a maximum heat load of 40.8 kW per canister. Fuel in the 24PTH-S/L DSCs may be stored in four alternate heat zoning configurations as shown in Figure P.2-1 through Figure P.2-4. The 24PTH-S-LC DSC has a maximum decay heat of 1.5 kW per assembly and a maximum heat load of 24 kW per canister. The heat zoning configuration to be used for the 24PTH-S-LC DSC is shown in Figure P.2-5. Note that while the B&W, CE, and Westinghouse fuel designs are specifically listed, storing reload fuel designed by other manufacturers is also allowed provided an analysis is performed to demonstrate that the limiting features listed in Table P.2-1 and Table P.2-3 bound the specific manufacturer's replacement fuel. The limiting features are burnup, initial enrichment, cooling time, number of fuel rods, cobalt impurities in the hardware and initial heavy metal weight.

The design-basis fuel source terms for this evaluation are defined as the source terms from fuel with the burnup/initial enrichment/cooling time combination given in Table P.2-6 through Table

P.2-9 (without CC) and located in the basket as shown in Figure P.2-1 through Figure P.2-5 that give the maximum dose rate on the surface of the HSM and/or TC. This approach is consistent

with the method used to generate the fuel qualification tables for the Standardized NUHOMS[®]-24P and -52B DSC designs as described in Section 7.2.3, or 32PT DSC design as described in Appendix M. The design basis fuel source term is then added to the design basis CC source term (Table P.5-12) to create the total fuel assemblies plus CC source term used in the calculations.

For the 24PTH-L DSC, Heat Load Zoning Configuration 2 (Figure P.2-2) is the configuration that produces the highest dose rates on the surfaces of the HSM-H and OS197FC TC as

that replace damaged fuel rods. Note that lower enriched UO2 rods are of similar design and behavior as the standard fuel rods aside from the uranium enrichment. The reconstituted rods can be at any location in the fuel assemblies and the reconstituted assemblies can be placed anywhere in the basket. Reconstituted fuel has a rather small effect on the dose rate such that for cooling times less than 10 years, 1 year of cooling time is added if reconstituted rods are present. Damaged fuel has essentially no impact on the dose rate as the source term would not be impacted and gross axial source redistribution is not likely. Therefore, shielding analysis results with intact fuel are also applicable to the damaged fuel.

The fuel qualification for the PLSAs is performed such that the resulting source terms are bounded by those for the design basis B&W 15x15 fuel assemblies. The bounding burnup, enrichment and cooling time combination for the PLSA used in the source term evaluation are as follows:

• 40 GWD/MTU, 1.2 wt. % U-235, 6.5 year cooled fuel

The methodology, assumptions, and criteria used in this evaluation are summarized in the following subsections.

P.5.2 <u>Source Specification</u>

Thermal and radiological source terms are calculated with the SAS2H/ORIGEN-S modules of SCALE 4.4 [5.1] for the fuel. The SAS2H/ORIGEN-S results are used to develop the fuel qualification tables listed in Table P.2-6 through Table P.2-13 and the design-basis fuel source terms suitable for use in the shielding calculations. The thermal and radiological source terms for the CCs which are taken from Appendix J, are shown in Table P.5-12.

The B&W 15x15 assembly is the bounding fuel assembly design for shielding purposes because it has the highest initial heavy metal loading and CO-59 content of the hardware regions as compared to the 14x14, other 15x15, and 17x17 fuel assemblies which are also authorized contents of the NUHOMS[®]-24PTH DSC. The neutron flux during reactor operation is peaked in the in-core region of the fuel assembly and drops off rapidly outside the in-core region. Much of the fuel assembly hardware is outside of the in-core region of the fuel assembly. To account for this reduction in neutron flux, the fuel assembly is divided into four exposure "regions." The four axial regions used in the source term calculation are: the bottom (nozzle) region, the in-core region, the (gas) plenum region, and the top (nozzle) region. The B&W 15x15 fuel assembly masses for each irradiation region are listed in Table P.5-6. The light elements that make up the various materials for the various fuel assembly materials are taken from reference [5.4] and are listed in Table P.5-7. The design-basis heavy metal weight is 0.490 MTU. These masses are irradiated in the appropriate fuel assembly region in the SAS2H/ORIGEN-S models. To account for the reduction in neutron flux outside the In-Core regions neutron flux (fluence) correction factors are applied to light element composition for each region. The neutron flux correction factors which are from Reference [5.15] are given in Table P.5-8.

The relevant design characteristics of the PLSAs important for source term evaluation are shown in Table P.5-6. The calculation of the source terms for the active region portion of the PLSA is identical to that of the design basis fuel assembly outlined above. A neutron flux correction factor is applied to the stainless steel rod section of the PLSA to account for the reduction in the neutron flux at these locations. A flux correction factor is required because these fuel assemblies are irradiated in the peripheral locations of the reactor core and the neutron flux around the steel rods is a few orders of magnitude lower than that around the fuel rods due to absence of any fission source.

A flux correction factor of 0.3 (shown in Table P.5-8) which is 1.5 times that for the plenum region is utilized to determine the source terms from the steel rods of the PLSA. The plenum region flux correction factor is chosen due to the similarities in the proximity to the active fuel region. Further, to account for the small variations in the radial flux distribution, an additional factor of 1.5 is utilized so that the resulting correction factor is conservative. This correction factor, therefore, is applicable to the outer row of the PLSAs that "see" the neutron flux from the adjacent, regular, fuel assemblies in the reactor core. For the other rows of steel rods, where the neutron flux practically drops to zero, this factor is conservative.

Evaluations of the existing data with SAS2H and the 44-group ENDF/B-V library used in the analysis are documented in References [5.11] and [5.12]. These comparisons all show generally good agreement between the calculations and measurements, and show no trend as a function of burnup in the data that would suggest that the isotopic predictions, and therefore neutron and

December 2006 Revision 0 gamma source terms, would not be in good agreement. A similar conclusion is also reached by the results documented in JAERI report [5.13]. In fact, for the case with 46,460 MWd/MTU burnup, the isotopic predictions are all within 2% of those measured. There are ongoing efforts, some of which are documented in Reference [5.10], to obtain more data for burnups above 45 GWd/MTU. There is no reason to expect that the ongoing evaluations of the higher burnup fuel will result in less favorable comparisons. Therefore, the uncertainty in the gamma source term, and associated dose rates, is estimated to be within ± 5 %.

As noted in References [5.14] and [5.10], there is no public data for the neutron component currently available that bounds a fuel burnup of up to 62 GWd/MTU. However, as documented in Reference [5.14] and confirmed in the SAS2H analysis, the total neutron source with increasing burnup is more and more dominated by spontaneous fission neutrons. Reviewing the output from the SAS2H runs, the neutron source term is due almost entirely to the spontaneous fission of Cm-244 (~94% of all neutrons both spontaneous fission and (α ,n)). After reviewing the measured Cm-244 content compared to the Cm-244 content predicted by SAS2H and the 44-group ENDF/B-V library documented in References [5.11] and [5.12] for burnups up to 46,460 MWd/MTU, it is readily apparent that the calculated values are within ±11 % of the measured values, with most of the predicted values within ±5% of the measured. Finally, there is no

entry in the fuel qualification tables. For each qualification table, the burnup/enrichment/cooling time combination that results in the highest dose rate is selected as the design basis source.

The results of the ANISN response function evaluation are given in Table P.5-23 and Table P.5-24 for the 2.0 kW OS197FC TC and HSM-H cases, respectively. The results for the 1.5 kW OS197FC TC and HSM-H cases are given in Table P.5-25 and Table P.5-26, respectively. Note that the 1.5 kW results are assumed to be applicable to the Standardized TC and HSM-Model 102. The maximum dose rate for each table corresponds to the design basis source for that decay heat and shielding configuration.

The results of the ANISN response function evaluation with the PLSAs indicate that they are bounded by the design basis fuel source terms. The dose rate for the DSC with PLSA in the OS197FC TC for is 876 mrem/hour which is below the design basis value of 907 mrem/hour. The dose rate for the DSC with PLSA in the HSM-H is 3.7 mrem/hour which is below the design basis value of 6.1 mrem/hour. Therefore, the source terms for the PLSA are bounded by the design basis source terms.

Note also that the values presented in Table P.5-23 though Table P.5-26 are based upon decay heats rounded to the nearest 0.1 year and not the final decay heats as presented in the fuel qualification tables, which have been conservatively rounded up to the nearest 0.5 year, as the design basis sources were selected prior to the rounding process.

P.5.2.5 <u>Reconstituted Fuel</u>

As explained in Section P.5.2, reconstituted fuel assemblies may contain up to 10 stainless steel rods that replace damaged fuel rods. Because steel rods replace fuel rods, the decay heat of a reconstituted assembly is typically less than the decay heat of an equivalent standard assembly. Conversely, because steel contains Co-59 which activates to form Co-60, for low cooling times a reconstituted assembly typically generates higher dose rates than an equivalent standard assembly. As the half-life of Co-60 is 5.27 years, after 10 years the Co-60 activity has reduced by almost a factor of four and a reconstituted assembly no longer generates higher dose rates than an equivalent standard assembly. To bound this effect, the fuel qualification tables require that for reconstitute rods with cooling times less than 10 years, additional one year of cooling time is required. For cooling times of 10 years or greater, no additional cooling time is required to bound the reconstituted fuel with steel rods.

To quantify this statement, additional SAS2H runs are generated for reconstituted assemblies. For each burnup and enrichment corresponding to a transition point in a fuel qualification table (i.e., the point where the cooling time experiences a change of 0.5 years), reconstituted assembly SAS2H models are developed.

The SAS2H input files for a reconstituted assembly are very similar to the input files for a standard assembly except for the following changes: (1) The number of fuel rods is reduced from 208 to 198, (2) the POWER input variable is adjusted to maintain the correct burnup for the reduced fuel loading, and (3) the light elements change to reflect that 10 fuel rods have been replaced with steel rods. The constituent masses of the reconstituted fuel assembly required for the SAS2H input is provided in Table P.5-6.

Note that a reconstituted rod cannot be irradiated for more than two cycles because the first cycle will always contain fresh, undamaged fuel. To accurately model this behavior, two SAS2H models are generated for each transition point. The first SAS2H model is for only one cycle of irradiation of 10 reconstituted rods, while the second SAS2H model is for three cycles of irradiation of 10 reconstituted rods. By subtracting the single cycle source term of the reconstituted rods from the total source term (fuel and reconstituted rods) for three cycles, the

Fuel Assembly Region, length	Fuel Assembly Part	Material	Standard Mass (kg)	Reconstituted Mass (kg)	
Top Nozzle,	Top Nozzle/Misc. Steel	SS-304	9.2	9.2	
6.23 in.	Hold Down Spring	Inconel-718	1.8	1.8	
	Upper Spring	Inconel-718	4.3	4.3	
n	Upper End Cap	Zircaloy-4	1.0	1.0	
Plenum, 8 73 in	Encompassing Clad.	Zircaloy-4	5.8	5.5	
0.75 m.	Upper End Grid	Inconel-718	1.1	1.1	
	Stainless Steel Rods	SS304	na	1.7 ·	
	Fuel Stack	UO ₂	490	466	
	Encompassing Clad.	Zircaloy-4	101.1	96.2	
In-core Region,	Encompassing Guide Tube	Zircaloy-4	6.3	6.3	
142.29 in.	Spacer Grids	Inconel-718	5.0	5.0	
	Grid Supports	Zircaloy-4	0.64	0.64	
	Stainless Steel Rods	SS304	na	27.2	
	Lower End Plug	Zircaloy-4	8.9	8.5	
	Encompassing Guide Tube	Zircaloy-4	0.1	0.1	
Bottom Nozzle,	Lower Guide Tube Plugs	Zircaloy-4	1.4	1.4	
8.38 in.	Lower End Fitting	SS 304	8.2	8.2	
	Lower End Grid	Inconel-718	1.1	1.1	
	Stainless Steel Rods	SS304	na	0.5	

Table P.5-6PWR Fuel Assembly Material Mass

Design Characteristics of PLSA								
Description	Parameter							
Fuel Assembly Class	Westinghouse 15x15							
Number of Fuel Rods	204 per assembly							
Active Fuel Length	102 inches							
Heavy Metal Loading	0.323 MTU per assembly							
Number of Stainless Steel Rods	204 per assembly							
Length of Stainless Steel Rods	42 inches							
Weight of Stainless Steel Rods	108.45 Kg per PLSA or 238.6 lbm per PLSA							
Location of Stainless Steel Rods	At the bottom of each fuel assembly							
All other design characteristics of the PLSA are identical to the WE 15x15 Class fuel assembly								

		Tabl	e P.5-8		
Flux	Scaling	Factors B	y Fuel	Assembly	y Region

Fuel Assembly Region	Flux Factor					
Bottom	0.20					
In-Core	1.00					
Plenum	0.20					
Тор	0.10					

Steel Rod Region (0.2) 1.5 0.5	PLSA Stainless Steel Rod Region	(0.2)*1.5 = 0.3
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P.6.1 Discussion and Results

Figure P.6-1 shows the cross section of the NUHOMS[®]-24PTH DSC. The NUHOMS[®]-24PTH DSC stainless steel basket consists of an "egg-crate" plate design. The fuel assemblies are housed in 24 stainless steel fuel compartment tubes with up to 12 damaged fuel assemblies occupying peripheral locations, as shown in Figure P.2-6. The basket structure, including the fuel compartment tubes, is held together with stainless steel insert plates and the poison and aluminum plates that form the "egg-crate" structure. The basket compartment structure is connected to perimeter rail assemblies, portions of it comprising of aluminum interface. The fuel compartment tube structure is connected to perimeter transition rail assemblies as shown on the drawings in Section P.1.5. The poison/aluminum plates are located between the fuel compartment tubes, as shown in Figure P.6-1.

The analysis presented herein is performed for a NUHOMS[®]-24PTH DSC in the NUHOMS[®]-OS197, OS197H, or OS197FC and Standardized Transfer casks (TCs) during normal, off-normal and accident loading conditions. This analysis also bounds all conditions of storage in the HSM (either HSM-H or HSM Model 102). The NUHOMS[®] TCs are identical for criticality purposes. The OS197FC design is identical to OS197 or OS197H TC with a modified lid design to allow for air circulation for enhanced heat removal. The NUHOMS[®] Transfer casks consist of an inner stainless steel shell, lead gamma shield, a stainless steel structural shell and a hydrogenous (liquid or solid) neutron shield. This analysis is applicable to any licensed cask of similar construction. The NUHOMS[®]-24PTH DSC/Cask configuration is shown to be subcritical under normal, off-normal and accident conditions of loading, transfer and storage.

The criticality analysis determines the most reactive configuration for the basket and fuel assembly position. Then criticality calculations evaluate a variety of fuel assembly types, initial enrichments and poison loadings (fixed and soluble poison). Table P.6-2 lists the fuel assemblies considered as authorized contents of the NUHOMS[®]-24PTH System. Finally, the maximum allowed initial enrichment for each fuel assembly type as a function of basket type (fixed poison loading and aluminum inserts) and soluble boron concentration is determined and is listed in Table P.6-3. Table P.6-10 shows the results of the analysis performed to determine the bounding configuration for Type 1 or Type 2 baskets (with or without aluminum inserts in R45 transition rails). The calculations determine k_{eff} with the CSAS25 control module of SCALE-4.4 [6.1] for each assembly type and initial enrichment, including all uncertainties to assure criticality safety under all credible conditions.

The Control Components (CCs) are also authorized for storage in the 24PTH DSCs. The authorized CCs are Burnable Poison Rod Assemblies (BPRAs), Control Rod Assemblies (CRAs), Rod Cluster Control Assemblies (RCCAs), Thimble Plug Assemblies (TPAs), Axial Power Shaping Rod Assemblies (APSRAs), Orifice Rod Assemblies (ORAs), Vibration Suppression Inserts (VSIs), Neutron Source Assemblies (NSAs), and Neutron Sources.

Additionally, calculations are carried out to determine the most reactive damaged fuel assembly (design basis damaged fuel assembly) configuration for each fuel assembly class. Then criticality calculations evaluate a variety of fuel assembly types, initial enrichments and poison loadings (fixed and soluble poison). Finally, the maximum allowed initial enrichment and the number of damaged assemblies per DSC for each fuel assembly type as a function of soluble

December 2006 Revision 0 boron concentration and fixed poison loading is determined and is summarized in Table P.6-4. The calculations determine k_{eff} with the CSAS25 control module of SCALE-4.4 [6.1] for each damaged assembly type and initial enrichment, including all uncertainties to assure criticality safety under all credible conditions.

The results of the evaluation demonstrate that the maximum expected k_{eff} , including statistical uncertainty, are less than the Upper Subcritical Limit (USL) determined from a statistical analysis of benchmark criticality experiments. The statistical analysis procedure includes a confidence band with an administrative safety margin of 0.05.

required for control components that extend into the active fuel region. For example, TPAs or ORAs are permitted for storage within a fuel assembly without adjusting the maximum initial enrichment or minimum soluble boron content given in Table P.6-3 and Table P.6-4, since TPAs or ORAs do not extend into the active fuel region.

For the WE 15x15 Class Partial Length Shield Assemblies (PLSAs), the effect of a reduced active fuel length (Table P.6-5) is at worst statistically insignificant. As the criticality analysis models are based on an infinitely long fuel assembly, the design basis evaluations for the regular WE 15x15 class assemblies conservatively cover the PLSAs.

Assembly Type ⁽¹⁾	· Array
Westinghouse 17x17 LOPAR/Standard	17x17
Westinghouse 17x17 OFA/Vantage 5 ⁽²⁾	17x17
CE 16x16 System 80 ⁽³⁾	16x16
B&W 15x15 Mark B (through B11)	15x15
CE 15x15 Palisades	15x15
Exxon/ANF 15x15 CE	15x15
Exxon/ANF 15x15 WE	15x15
Westinghouse 15x15 Standard/ZC ⁽⁴⁾	15x15
CE 14x14 Standard/Generic	14x14
CE 14x14 Fort Calhoun	14x14
Exxon/ANF 14x14 WE	14x14
Westinghouse 14x14 ZCA/ZCB	14x14
Westinghouse 14x14 OFA	14x14

 Table P.6-2

 Authorized Contents for NUHOMS[®]-24PTH System

Notes:

- (1) Reload fuel from other manufacturers with these parameters are also acceptable.
- (2) Includes all Vantage versions (5, +, ++, etc.)
- (3) The CE 16x16 System 80 fuel assembly is 178.25 inches long and therefore may not fit in the NUHOMS[®]-24PTH DSC unless the cavity length is increased. This fuel assembly is included in this analysis to cover for that eventuality.
- (4) Includes Partial Length Shield Assemblies (PLSAs)

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				Number Fuel		
			Active Fuel	Rods per		Fuel Pellet
Manufacturer ⁽¹⁾	Array	Version	Length (in)	Assembly	Pitch (in)	OD (in)
WE	17x17	LOPAR	144	264	0.496	0.3225
WE	17x17	OFA/Van 5	144	264	0.496	0.3088
CE	16x16	System 80	150	236	0.506	0.3255
B&W	15x15	Mark B2 – B7	141.8	208	0.568	0.3686
B&W	15x15	Mark B8	141.8	208	0.568	0.3686
B&W	15x15	Mark B9	140.6	208	0.568	0.3700
B&W	15x15	Mark B10	142.3	208	0.568	0.3735
B&W	15x15	Mark B11	142.3	208	0.568	0.3715
CE	15x15	Palisades	132	216	0.550	0.3600
Exxon/ANF	15x15	CE	131.8	216	0.550	0.3565
Exxon/ANF	15x15	. WE	144 ⁽⁷⁾	204	0.563	0.3565
WE	15x15	Std/ZC	144 ⁽⁷⁾	204	0.563	0.3659
CE	14x14	Std/Gen	137	176	0.580	0.3765
CE	14x14	Ft. Calhoun	128	176	0.580	0.3815
Exxon/ANF	14x14	WE	142	179	0.556	0.3505
WE	14x14	ZCA/ZCB	144	179	0.556	0.3659
WE	14x14	OFA	144	179	0.556	0.3444

Table P.6-5Parameters For PWR Assemblies

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		(0	Concluded)				
Manufacturer ⁽¹⁾	Array	Version	Clad Thickness (in)	Clad OD (in)	Guide Tube OD (in)	Instrument Tube ID (in)	
WE	17x17	LOPAR	0.0225	0.374	24@0.474 1@0.480	24@0.422 1@0.450	
WE	17x17	OFA/Van 5	0.0225	0.360	24@0.482 1@0.476	24@0.450 1@0.460	
CE	16x16	System 80	0.0250	0.382	5@0.768	5@0.687	
B&W	15x15	Mark B2 – B7	0.0265	0.430	16@0.530 1@0.493	16@0.498 1@441	
B&W	15x15	Mark B8	0.0265	0.430	16@0.530 1@0.493	16@0.498 1@441	
B&W	15x15	Mark B9	0.0265	0.430	16@0.530 1@0.493	16@0.498 1@441	
B&W	15x15	Mark B10	0.0250	0.430	16@0.530 1@0.493	16@0.498 1@441	
B&W	15x15	Mark B11 ⁽²⁾	0.0240	0.416	16@0.530 1@0.493	16@0.498 1@441	
CE	15x15	Palisades	0.0260 ⁽³⁾	0.418 ⁽⁴⁾	8@0.4135	8@0.3655	
Exxon/ANF	15x15	CE	0.0300	0.417	8Guide Bars ⁽⁵⁾ 1@0.417	1@0.363	
Exxon/ANF	15x15	WE	0.0300	0.424	20@0.544 1@0.544	20@0.510 1@0.510	
WE	15x15	Std/ZC	0.0242	0.422	20@0.546 1@0.546	20@0.512 1@0.512	
CE	14x14	Std/Gen	0.0280	0.440	5@1.115	5@1.035	
CE	14x14	Ft. Calhoun	0.0280	0.440	5@1.115	5@1.035	
Exxon/ANF	14x14	WE	0.0300	0.424	16@0.541 1@0.480	16@0.507 1@0.448	
WE	14x14	ZCA/ZCB	0.0225	0.422	16@0.539 1@0.422	16@0.505 1@0.392	
WE	14x14	OFA	0.0243	0.400	16@0.526 1@0.400	16@0.492 1@0.353	

Table P.6-5Parameters For PWR Assemblies

NOTES:

(1) Reload fuel assemblies from other manufacturers with these parameters are also acceptable.

(2) Pellet OD ranges from 0.3510 to 0.3600 inches.

(3) Clad thickness ranges from 0.0240 to 0.0295 inches

(4) Clad OD ranges from 0.4135 to 0.4175 inches

(5) Guide Bars are solid Zircaloy-4 approximately 0.40 inches x 0.45 inches

(6) All dimensions shown are nominal

(7) The active fuel length for the PLSA is less than 144".