APPENDIX A TO CERTIFICATE OF COMPLIANCE NO. 1029

TECHNICAL SPECIFICATIONS FOR THE ADVANCED NUHOMS® SYSTEM

OPERATING CONTROLS AND LIMITS

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OPERATING CONTROLS AND LIMITS

1.0 Use and Application

1.1 Definitions

-- NOTE --

The defined terms of this section appear in capitalized type and are applicable throughout these Technical Specifications and Bases.

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Term	Definition
ACTIONS	ACTIONS shall be that part of a Specification that prescribes Required ACTIONS to be taken under designated Conditions within specified Completion Times.
ADVANCED HORIZONTAL STORAGE MODULE (AHSM)	The AHSM is a reinforced concrete structure for storage of a loaded 24PT1-DSC or 24PT4-DSC (DSC) at a spent fuel storage facility
DAMAGED FUEL ASSEMBLY	A DAMAGED FUEL ASSEMBLY is a FUEL ASSEMBLY with known or suspected cladding defects greater than pinhole leaks or hairline cracks or an assembly with partial or missing rods.
DRY SHIELDED CANISTER (DSC)	A 24PT1-DSC or 24PT4-DSC is a welded pressure vessel that provides confinement of INTACT or DAMAGED FUEL ASSEMBLIES in an inert atmosphere.
FAILED FUEL CAN	A FAILED FUEL CAN confines any loose material and gross fuel particles to a known, subcritical volume during normal, off-normal and accident conditions and facilitates handling and retrievability.
FUEL DEBRIS	An intact or partial fuel rod not contained in a FUEL ASSEMBLY grid or an individual intact or partial fuel pellet not contained in a fuel rod. FUEL DEBRIS may be inserted in a ROD STORAGE BASKET.
INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)	The facility within a perimeter fence licensed for storage of spent fuel within AHSMs.
INTACT FUEL ASSEMBLY	Spent Nuclear FUEL ASSEMBLIES without known or suspected cladding defects greater than pinhole leaks or hairline cracks and which can be handled by normal means.
LOADING OPERATIONS	LOADING OPERATIONS include all licensed activities on a DSC while it is being loaded with INTACT or

	DAMAGED FUEL ASSEMBLIES, and on a TRANSFER CASK while it is being loaded with a DSC containing INTACT or DAMAGED FUEL ASSEMBLIES. LOADING OPERATIONS begin when the first INTACT or DAMAGED FUEL ASSEMBLY is placed in the DSC and end when the TRANSFER CASK is ready for TRANSFER OPERATIONS.
RECONSTITUTED FUEL ASSEMBLY	RECONSTITUTED FUEL ASSEMBLIES include assemblies in which leaking fuel rods are replaced with either stainless steel rods or intact fuel rods prior to return to the reactor. RECONSTITUTED FUEL ASSEMBLIES may contain from one to eight stainless steel rods per assembly.
ROD STORAGE BASKET	A 9x9 array of tubes in a lattice that has approximately the same dimensions as a standard FUEL ASSEMBLY.
STORAGE OPERATIONS	STORAGE OPERATIONS include all licensed activities that are performed at the ISFSI while a DSC containing INTACT or DAMAGED FUEL ASSEMBLIES is located in an AHSM on the storage pad within the ISFSI perimeter.
TRANSFER CASK (TC)	The TRANSFER CASK will consist of a licensed NUHOMS® OS197 or OS197H onsite transfer cask. The TRANSFER CASK will be placed on a transfer trailer for movement of a DSC to the AHSM.
TRANSFER OPERATIONS	TRANSFER OPERATIONS include all licensed activities involving the movement of a TRANSFER CASK loaded with a DSC containing INTACT or DAMAGED FUEL ASSEMBLIES. TRANSFER OPERATIONS begin when the TRANSFER CASK is placed on the transfer trailer following LOADING OPERATIONS and end when the DSC is located in an AHSM on the storage pad within the ISFSI perimeter.
UNLOADING OPERATIONS	UNLOADING OPERATIONS include all licensed activities on a DSC to unload INTACT or DAMAGED FUEL ASSEMBLIES. UNLOADING OPERATIONS begin when the DSC is removed from the AHSM and end when the last INTACT or DAMAGED FUEL ASSEMBLY has been removed from the DSC.

1.2 Logical Connectors

PURPOSE

The purpose of this section is to explain the meaning of logical connectors.

Logical connectors are used in Technical Specifications (TS) to discriminate between, and yet connect, discrete Conditions, Required Actions, Completion Times, Surveillances, and Frequencies. The only logical connectors that appear in TS are AND and OR. The physical arrangement of these connectors constitutes logical conventions with specific meanings.

BACKGROUND

Several levels of logic may be used to state Required Actions. These levels are identified by the placement (or nesting) of the logical connectors and by the number assigned to each Required Action. The first level of logic is identified by the first digit of the number assigned to a Required Action and the placement of the logical connector in the first level of nesting (i.e., left justified with the number of the Required Action). The successive levels of logic are identified by additional digits of the Required Action number and by successive indentions of the logical connectors.

When logical connectors are used to state a Condition, Completion Time, Surveillance, or Frequency, only the first level of logic is used, and the logical connector is left justified with the statement of the Condition, Completion Time, Surveillance, or Frequency.

EXAMPLES

The following examples illustrate the use of logical connectors:

EXAMPLE 1.2-1:

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Verify . . . AND A.2 Restore . . .	

In this example the logical connector AND is used to indicate that when in Condition A, both Required Actions A.1 and A.2 must be completed.

1.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 1.2-2:

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Stop . . . OR A.2.1 Verify . . . AND A.2.2.1 Reduce . . . OR A.2.2.2 Perform . . . OR A.3 Remove . . .	

This example represents a more complicated use of logical connectors. Required Actions A.1, A.2, and A.3 are alternative choices, only one of which must be performed as indicated by the use of the logical connector OR and the left justified placement. Any one of these three Actions may be chosen. If A.2 is chosen, then both A.2.1 and A.2.2 must be performed as indicated by the logical connector AND. Required Action A.2.2 is met by performing A.2.2.1 or A.2.2.2. The indented position of the logical connector OR indicates that A.2.2.1 and A.2.2.2 are alternative choices, only one of which must be performed.

1.3 Completion Times

PURPOSE	The purpose of this section is to establish the Completion Time convention and to provide guidance for its use.
BACKGROUND	Limiting Conditions for Operation (LCOs) specify the lowest functional capability or performance levels of equipment required for safe operation of the facility. The ACTIONS associated with an LCO state Conditions that typically describe the ways in which the requirements of the LCO are not met. Specified with each stated Condition are Required Action(s) and Completion Times(s).
DESCRIPTION	The Completion Time is the amount of time allowed for completing a Required Action. It is referenced to the time of discovery of a situation (e.g., equipment or variable not within limits) that requires entering an ACTIONS Condition unless otherwise specified, providing the facility is in a specified condition stated in the Applicability of the LCO. Required Actions must be completed prior to the expiration of the specified Completion Time. An ACTIONS Condition remains in effect and the Required Actions apply until the Condition no longer exists or the facility is not within the LCO Applicability. Once a Condition has been entered, subsequent subsystems, components, or variables expressed in the Condition, discovered to be not within limits, will <u>not</u> result in separate entry into the Condition unless specifically stated. The Required Actions of the Condition continue to apply to each additional failure, with Completion Times based on initial entry into the Condition.

EXAMPLES

The following examples illustrate the use of Completion Times with different types of Conditions and changing Conditions:

EXAMPLE 1.3-1:

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Perform Action B.1. AND B.2 Perform Action B.2	12 hours 36 hours

Condition B has two Required Actions. Each Required Action has its own separate Completion Time. Each Completion Time is referenced to the time that Condition B is entered.

The Required Actions of Condition B are to complete action B.1 within 12 hours AND complete action B.2 within 36 hours. A total of 12 hours is allowed for completing action B.1 and a total of 36 hours (not 48 hours) is allowed for completing action B.2 from the time that Condition B was entered. If action B.1 is completed within 6 hours, the time allowed for completing action B.2 is the next 30 hours because the total time allowed for completing action B.2 is 36 hours.

EXAMPLES (continued)

EXAMPLE 1.3-2:

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One system not within limit	A.1 Restore system to within limit.	7 days
B. Required Action and associated Completion Time not met.	B.1 Perform Action B.1. AND B.2 Perform Action B.2.	12 hours 36 hours

When a system is determined to not meet the LCO, Condition A is entered. If the system is not restored within 7 days, Condition B is also entered and the Completion Time clocks for Required Actions B.1 and B.2 start. If the system is restored after Condition B is entered, Condition A and B are exited, and therefore, the Required Actions of Condition B may be terminated.

EXAMPLES (continued)

EXAMPLE 1.3-3:

ACTIONS

-------------------------NOTE---

Separate Condition entry is allowed for each component.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Restore compliance with LCO.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Perform Action B.1. AND B.2 Perform Action B.2.	6 hours 12 hours

The Note above the ACTIONS Table is a method of modifying how the Completion Time is tracked. If this method of modifying how the Completion Time is tracked was applicable only to a specific Condition, the Note would appear in that Condition rather than at the top of the ACTIONS Table.

The Note allows Condition A to be entered separately for each component, and Completion Times tracked on a per component basis. When a component is determined to not meet the LCO, Condition A is entered and its Completion Time starts. If subsequent components are determined to not meet the LCO, Condition A is entered for each component and separate Completion Times start and are tracked for each component.

IMMEDIATE COMPLETION TIME

When "Immediately" is used as a Completion Time, the Required Action should be pursued without delay and in a controlled manner.

1.4 Frequency

PURPOSE	The purpose of this section is to define the proper use and application of Frequency requirements.

DESCRIPTION

Each Surveillance Requirement (SR) has a specified Frequency in which the Surveillance must be met in order to meet the associated Limiting Condition for Operation (LCO). An understanding of the correct application of the specified Frequency is necessary for compliance with the SR.

The "Specified Frequency" is referred to throughout this section and each of the Specifications of Section 12.3, Surveillance Requirement (SR) Applicability. The "Specified Frequency" consists of the requirements of the Frequency column of each SR, as well as certain Notes in the Surveillance column that modify performance requirements.

Situations where a Surveillance could be required (i.e., its Frequency could expire), but where it is not possible or not desired that it be performed until sometime after the associated LCO is within its Applicability, represent potential SR 12.3.0.4 conflicts. To avoid these conflicts, the SR (i.e., the Surveillance or the Frequency) is stated such that it is only "required" when it can be and should be performed. With a SR satisfied, SR 12.3.0.4 imposes no restriction.

EXAMPLES

The following examples illustrate the various ways that Frequencies are specified:

EXAMPLE 1.4-1:

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify Pressure within limit.	12 hours

Example 1.4-1 contains the type of SR most often encountered in the Technical Specifications (TS). The Frequency specifies an interval (12 hours) during which the associated Surveillance must be performed at least one time. Performance of the Surveillance initiates the subsequent interval. Although the Frequency is stated as 12 hours, an extension of the time interval to 1.25 times the stated Frequency is allowed by SR 12.3.0.2 for operational flexibility. The measurement of this interval continues at all times, even when the SR is not required to be met per SR 12.3.0.1 (such as when the equipment is determined to not meet the LCO, a variable is outside specified limits, or the unit is outside the Applicability of the LCO). If the interval specified by SR 12.3.0.2 is exceeded while the facility is in a condition specified in the Applicability of the LCO, the LCO is not met in accordance with SR 12.3.0.1.

If the interval as specified by SR 12.3.0.2 is exceeded while the facility is not in a condition specified in the Applicability of the LCO for which performance of the SR is required, the Surveillance must be performed within the Frequency requirements of SR 12.3.0.2 prior to entry into the specified condition. Failure to do so would result in a violation of SR 12.3.0.4.

EXAMPLES (continued)

EXAMPLE 1.4-2:

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify flow is within limits.	Once within 12 hours prior to starting activity AND 24 hours thereafter

Example 1.4-2 has two Frequencies. The first is a one-time performance Frequency, and the second is of the type shown in Example 1.4-1. The logical connector "AND" indicates that both Frequency requirements must be met. Each time the example activity is to be performed, the Surveillance must be performed prior to starting the activity.

The use of "once" indicates a single performance will satisfy the specified Frequency (assuming no other Frequencies are connected by "AND"). This type of Frequency does not qualify for the 25% extension allowed by SR 12.3.0.2.

"Thereafter" indicates future performances must be established per SR 12.3.0.2, but only after a specified condition is first met (i.e., the "once" performance in this example). If the specified activity is canceled or not performed, the measurement of both intervals stops. New intervals start upon preparing to restart the specified activity.

EXAMPLES (continued)

EXAMPLE 1.4-3:

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
------NOTE------- Not required to be met until 96 hours after verifying the helium leak rate is within limit. Verify 24PT1-DSC vacuum drying pressure is within limit.	Once after verifying the helium leak rate is within limit.

As the Note modifies the required performance of the Surveillance, it is construed to be part of the "specified Frequency." Should the vacuum drying pressure not be met immediately following verification of the helium leak rate while in LOADING OPERATIONS, this Note allows 96 hours to perform the Surveillance. The Surveillance is still considered to be performed within the "specified Frequency."

Once the helium leak rate has been verified to be acceptable, 96 hours, plus the extension allowed by SR 12.3.0.2, would be allowed for completing the Surveillance for the vacuum drying pressure. If the Surveillance was not performed within this 96 hour interval, there would then be a failure to perform the Surveillance within the specified Frequency, and the provisions of SR 12.3.0.3 would apply.

2.0 Functional and Operating Limits

2.1 Fuel To Be Stored In The 24PT1-DSC

The spent nuclear fuel to be stored in each 24PT1-DSC/AHSM at the ISFSI shall meet the following requirements:

a. Fuel shall be INTACT FUEL ASSEMBLIES or DAMAGED FUEL ASSEMBLIES. DAMAGED FUEL ASSEMBLIES shall be placed in screened confinement cans (FAILED FUEL CANS) inside the 24PT1-DSC guidesleeves. DAMAGED FUEL ASSEMBLIES shall be stored in outermost guidesleeves located at the 45, 135, 225 and 315 degree azimuth locations.

b. Fuel types shall be limited to the following:

   UO_2 Westinghouse 14x14 (WE 14x14) Assemblies (with or without IFBA fuel rods), as specified in Table 2-1.

   WE 14x14 Mixed Oxide (MOX) Assemblies, as specified in Table 2-1.

   Fuel burnup and cooling time is to be consistent with the limitations specified in Table 2-4 for UO2 fuel.

   Control Components stored integral to WE 14x14 Assemblies in a 24PT1-DSC, shall be limited to Rod Cluster Control Assemblies (RCCAs), Thimble Plug Assemblies (TPAs), and Neutron Source Assemblies (NSAs). Location of control components within a 24PT1-DSC shall be selected based on criteria which does not change the radial center of gravity by more than 0.1 inches.

c. The maximum heat load for a single FUEL ASSEMBLY, including control components, is 0.583 kW for SC FUEL ASSEMBLIES and 0.294 kW for MOX FUEL ASSEMBLIES. The maximum heat load per 24PT1-DSC, including any integral Control Components, shall not exceed 14 kW when loaded with all SC FUEL ASSEMBLIES and 13.706 kW when loaded with MOX FUEL ASSEMBLIES.

d. Fuel can be stored in the 24PT1-DSC in any of the following configurations:

   1) A maximum of 24 INTACT WE 14x14 MOX or SC FUEL ASSEMBLIES; or
   2) Up to four WE 14x14 SC DAMAGED FUEL ASSEMBLIES, with the balance INTACT WE 14x14 SC FUEL ASSEMBLIES; or
   3) One MOX DAMAGED FUEL ASSEMBLY with the balance INTACT WE 14x14 SC FUEL ASSEMBLIES.

   A 24PT1-DSC containing less than 24 FUEL ASSEMBLIES may contain dummy FUEL ASSEMBLIES in FUEL ASSEMBLY slots. The dummy FUEL ASSEMBLIES are unirradiated, stainless steel encased structures that approximate the weight and center of gravity of a FUEL ASSEMBLY. The effect of dummy assemblies or empty FUEL ASSEMBLY slots on the radial center of gravity of the DSC must meet the requirements of Section 2.1.b.

No more than two empty FUEL ASSEMBLY slots are allowed in each DSC. They must be located at symmetrical locations about the 0-180° and 90-270° axes.

No more than 14 fuel pins in each assembly may exhibit damage. A visual inspection of assemblies will be performed prior to placement of the fuel in the 24PT1-DSC, which may then be placed in storage or transported anytime thereafter without further fuel inspection.

e. Fuel dimensions and weights are provided in Table 2-2.

f. The maximum neutron and gamma source terms are provided in Table 2-3.

2.2 <u>Fuel to Be Stored in the 24PT4-DSC</u>

g. The spent fuel to be stored in the NUHOMS® 24PT4-DSC consists of INTACT (including RECONSTITUTED) Westinghouse-CENP 16x16 (CE 16x16) and/or DAMAGED CE 16x16 FUEL ASSEMBLIES with Zircaloy or ZIRLO™ cladding and UO_2, (U, Er)O_2 or (U, Gd)O_2 fuel pellets. Assemblies are with or without integral burnable poison rods or integral fuel burnable absorber (IFBA) rods.

h. Each 24PT4-DSC can accommodate a maximum of 12 DAMAGED FUEL ASSEMBLIES, with the remaining assemblies being intact.

RECONSTITUTED ASSEMBLIES containing up to eight replacement stainless steel rods in place of DAMAGED FUEL Rods or replacement Zircaloy clad uranium rods (any number per assembly) are acceptable for storage in the 24PT4-DSC as either INTACT or DAMAGED ASSEMBLIES.

DAMAGED FUEL may include assemblies with known or suspected cladding defects greater than pinhole leaks or hairline cracks or an assembly with partial and/or missing rods (i.e., extra water holes). DAMAGED FUEL ASSEMBLIES shall be encapsulated in individual FAILED FUEL CANS placed in locations as shown in Figure 2-4.

FUEL DEBRIS and DAMAGED FUEL Rods that have been removed from a DAMAGED FUEL ASSEMBLY and placed in a ROD STORAGE BASKET are also considered as DAMAGED FUEL. A ROD STORAGE BASKET is a 9x9 array of tubes in a lattice that has approximately the same dimensions as a standard FUEL ASSEMBLY. ROD STORAGE BASKETS may also include IFBA and Integral Burnable Poison Rods. Loose FUEL DEBRIS not contained in a ROD STORAGE BASKET may be placed in a FAILED FUEL CAN for storage provided the size of the debris is larger than the FAILED FUEL CAN screen mesh opening. FUEL DEBRIS may be associated with any type of UO_2 fuel provided that the maximum uranium content and enrichment limits are met.

i. The INTACT and/or DAMAGED CE 16x16 FUEL ASSEMBLIES acceptable for storage in 24PT4-DSC are specified in Table 2-5, Table 2-6, and Table 2-7. The fuel to be stored in the 24PT4-DSC is limited to a maximum initial enrichment of 4.85 wt. % ^{235}U. The maximum allowable assembly burnup is given as a function of initial fuel enrichment but does not exceed 60,000 MWd/MTU. The minimum cooling time is 5 years.

j. A 24PT4-DSC containing less than 24 FUEL ASSEMBLIES may contain dummy FUEL ASSEMBLIES in FUEL ASSEMBLY slots, or empty slots. The dummy FUEL ASSEMBLIES are unirradiated, stainless steel encased structures that approximate the weight and center of gravity of a FUEL ASSEMBLY.

k. The 24PT4-DSC may store PWR assemblies in any one of the three alternate configurations shown in Figure 2-1 through Figure 2-3 with a maximum heat load of 1.26 kW per assembly and a maximum heat load of 24 kW per DSC. Table 2-9 through Table 2-12 define the FUEL ASSEMBLY cooling time (in years) based on FUEL ASSEMBLY burnup and initial fuel enrichment for the assembly, assuming that no reconstituted fuel with stainless steel rods is present. The fuel qualification tables to be used for reconstituted assemblies with stainless steel rods are provided in Table 2-13 through Table 2-16. These tables ensure that the FUEL ASSEMBLY decay heat load is less than that specified for each table and that the corresponding radiation source term is bounded by that analyzed in Chapter A.5.

l. Two different 24PT4-DSC basket configurations are provided, as shown in Table 2-8. These configurations differ in the boron loading in the Boral® plates. The minimum areal boron –10 (^{10}B) concentrations for the standard (Type A basket) and high (Type B basket) loadings are 0.025 and 0.068 g/cm^2, respectively. Fuel to be stored in the standard ^{10}B loading 24PT4-DSC is limited to an initial ^{235}U enrichment of 4.1 wt. %. Fuel to be stored in the high ^{10}B loading 24PT4-DSC is limited to an initial ^{235}U enrichment of 4.85 wt. %.

m. Up to four DAMAGED FUEL ASSEMBLIES may be stored in a 24PT4-DSC of either ^{10}B loading without impact upon the maximum allowed ^{235}U enrichment and without the use of additional poison rodlets. The DAMAGED ASSEMBLIES shall be stored in FAILED FUEL CANS located at the 45, 135, 225 and 315 degree azimuth locations (Zone A of Figure 2-4).

Five to twelve DAMAGED FUEL ASSEMBLIES may be stored in a 24PT4-DSC of either ^{10}B loading without the use of poison rodlets if the maximum allowed ^{235}U enrichment is reduced for the DAMAGED ASSEMBLIES. The intact assembly enrichment limits remain at their nominal values of 4.1 and 4.85 wt. % for the standard and high ^{10}B loadings, respectively. DAMAGED FUEL to be stored in the standard ^{10}B loading 24PT4-DSC is limited to an initial ^{235}U enrichment of 3.7 wt. %, and DAMAGED FUEL to be stored in the high ^{10}B loading 24PT4-DSC is limited to an initial ^{235}U enrichment of 4.1 wt. %. All DAMAGED ASSEMBLIES shall be stored in FAILED FUEL CANS located in Zones A and B of Figure 2-4.

Five to twelve DAMAGED FUEL ASSEMBLIES may be stored in a 24PT4-DSC of either ^{10}B loading without impact upon the maximum allowed ^{235}U enrichment if poison rodlets are utilized. For the standard ^{10}B loading, a single poison rodlet is inserted into the center guide tube of each INTACT FUEL ASSEMBLY located in Zone C of Figure 2-4. For the high ^{10}B loading, a poison rodlet is inserted into each of the five guide tubes in each INTACT FUEL ASSEMBLY located in Zone C of Figure 2-4. All DAMAGED ASSEMBLIES shall be stored in FAILED FUEL CANS located in Zones A and B of Figure 2-4.

The poison rodlets consist of B_4C (pellets or powder) encased in a 0.75" nominal OD stainless steel tube with a wall thickness of 0.035". The minimum linear B_4C content is 0.70 g/cm with sufficient length to cover the active fuel length.

Fuel Assembly poison rods installed within the guide tubes for criticality control in the spent fuel pool racks may be stored with any INTACT FUEL ASSEMBLY or DAMAGED FUEL ASSEMBLIES as long as the total assembly weight is less than that specified in Table 2-5. Each poison rodlet may include a lifting mechanism to allow insertion into the selected SFA guide tube.

A summary of the storage configurations analyzed is presented in Table 2-8.

2.3 Functional and Operating Limits Violations

If any Functional and Operating Limit of 2.1 is violated, the following actions shall be completed:

a. The affected FUEL ASSEMBLIES shall be placed in a safe condition.

b. Within 24 hours, notify the NRC Operations Center.

c. Within 30 days, submit a special report which describes the cause of the violation and the actions taken to restore compliance and prevent recurrence.

Table 2-1 Fuel Specifications (24PT1-DSC)

Fuel Type	Maximum Initial Enrichment	Cladding Material	Minimum Cooling Time	Minimum Initial Enrichment	Maximum Burnup
UO_2 WE 14x14 (with or without IFBA fuel rods)	4.05 weight % U-235	Type 304 Stainless Steel	10 years	See Table 2-4 for Enrichment, Burnup, and Cooling Time Limits.	
WE 14x14 MOX	2.84 weight % Fissile Pu - 64 rods 3.10 weight % Fissile Pu - 92 rods 3.31 weight % Fissile Pu - 24 rods	Zircalloy-4	20 years	2.78 weight % Fissile Pu –64 rods 3.05 weight % Fissile Pu –92 rods 3.25 weight % Fissile Pu – 24 rods	25,000 MWd/MTU
Integral Control Components	N/A	N/A	10 years	N/A	N/A

Table 2-2 Fuel Dimension and Weights (24PT1-DSC)

Parameter	WE 14x14 SC[1]	WE 14x14 MOX[1]
Number of Rods	180	180
Number of Guide Tubes/Instrument Tubes	16	16
Cross Section (in)	7.763	7.763
Unirradiated Length (in)	138.5	138.5
Fuel Rod Pitch (in)	0.556	0.556
Fuel Rod O.D. (in)	0.422	0.422
Clad Material	Type 304 SS	Zircaloy-4
Clad Thickness (in)	0.0165	0.0243
Pellet O.D. (in)	0.3835	0.3659
Max. initial ^{235}U Enrichment (%wt)	4.05	Note 2
Theoretical Density (%)	93-95	91
Active Fuel Length (in)	120	119.4
Max. U Content (kg)	375	Note 3
Assembly Weight (lbs)	1210	1150
Max. Assembly Weight incl. NFAH[4] (lbs)	1320	1320

(1) Nominal values shown unless stated otherwise

(2) Mixed-Oxide assemblies with 0.71 weight % U-235 and maximum fissile Pu weight of 2.84 weight % (64 rods), 3.10 weight % (92 rods), and 3.31 weight % (24 rods)

(3) Total weight of Pu is 11.24 kg and the total weight of U is 311.225 kg

(4) Weights of TPAs and NSAs are enveloped by RCCAs

Table 2-3 Maximum Neutron and Gamma Source Terms (24PT1-DSC)

Parameter	WE 14x14 SC	WE 14x14 MOX
Gamma Source (γ/sec/assy)	3.43E+15	9.57E+14
Neutron Source (n/sec/assy)	2.84E+08	4.90E+07

Parameter	RCCAs	TPAs	NSAs
Gamma Source (γ/sec/assy)	7.60E+12	5.04E+12	1.20E+13
Decay heat (Watts)	1.90	1.2	1.66

Table 2-4 Fuel Qualification Table (24PT1-DSC)

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

Burnup GWd/MTU	Initial Enrichment (weight % U-235)			
	3.12	**3.36**	**3.76**	**3.96**
45.0	Not Analyzed	Not Analyzed	15.2	15.2*
43.3	Not Analyzed	Not Analyzed	15.2	11.5
40.0	Not Analyzed	10.9	10.9**	10.9**
36.8	Not Analyzed	10.9	10.0***	10.0***
35.0 or less	10.0***	10.0***	10.0***	10.0***

Notes

* Cooling time based on 3.76 weight % enrichment is conservatively used.
** Cooling time based on 3.36 weight % enrichment is conservatively used.
*** Cooling time based on shielding analysis source term.

General Notes:

- Use burnup and enrichment to look up 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.
- Example: An assembly with an initial enrichment of 3.90 w/o U-235 and a burnup of 37 GWd/MTU is acceptable for storage after a 10.9 year cooling time as defined at the intersection of 3.76 weight % U-235 (rounding down) and 40 GWd/MTU (rounding up) on the qualification table.

Table 2-5 PWR Fuel Specification of Intact Fuel to be stored in NUHOMS® 24PT4-DSC

Fuel Design:	INTACT CE 16x16 PWR FUEL ASSEMBLY or equivalent reload fuel that is enveloped by the FUEL ASSEMBLY design characteristics as listed in Table 2-7 and the following requirements:
Fuel Damage:	Fuel with known or suspected cladding damage in excess of pinhole leaks or hairline cracks or an assembly with partial and/or missing rods is not authorized to be stored as "INTACT PWR FUEL."
Physical Parameters(1)	
Unirradiated Length (in)	176.8
Cross Section (in)	8.290
Assembly Weight (lbs)	1500(2)
No. of Assemblies per DSC	#24 intact assemblies
Max. U Content (kg)	455.5
Fuel Cladding	Zircaloy-4 or ZIRLO™
RECONSTITUTED FUEL ASSEMBLIES	DAMAGED FUEL Rods replaced by either stainless steel rods (up to 8 rods per assembly) or Zircaloy clad uranium rods (any number of rods per assembly)
Nuclear and Radiological Parameters	
Maximum Initial ^{235}U Enrichment (wt %)	Per Table 2-8 and Figure 2-4
Fuel Burnup and Cooling Time	Per Table 2-9, Table 2-10, Table 2-11 and Table 2-12 For RECONSTITUTED FUEL with stainless steel replacement rods per Table 2-13, Table 2-14, Table 2-15 and Table 2-16
Decay Heat	Per Figure 2-1, Figure 2-2 or Figure 2-3

Notes:

(1) Nominal values shown unless stated otherwise.
(2) Does not include weight of Poison Rodlets (25 lbs each).

Table 2-6 PWR Fuel Specifications of DAMAGED FUEL to be Stored in NUHOMS® 24PT4-DSC

Fuel Design:	DAMAGED CE 16x16 PWR FUEL ASSEMBLY or equivalent reload fuel that is enveloped by the FUEL ASSEMBLY design characteristics as listed in Table 2-7 and the following requirements:
Fuel Damage:	DAMAGED FUEL may include assemblies with known or suspected cladding defects greater than pinhole leaks or hairline cracks or an assembly with partial and/or missing rods (i.e., extra water holes). DAMAGED FUEL ASSEMBLIES shall be encapsulated in individual FAILED FUEL CANS and placed in Zones A and/or B as shown in Figure 2-4. FUEL DEBRIS and DAMAGED FUEL Rods that have been removed from a DAMAGED FUEL ASSEMBLY and placed in a ROD STORAGE BASKET are also considered as DAMAGED FUEL. Loose FUEL DEBRIS not contained in a ROD STORAGE BASKET, may also be placed in a FAILED FUEL CAN for storage, provided the size of the debris is larger than the FAILED FUEL CAN screen mesh opening. FUEL DEBRIS may be associated with any type of UO_2 fuel provided that the maximum uranium content and enrichment limits are met.
Physical Parameters(1)	
Unirradiated Length (in)	176.8
Cross Section (in)	8.290
Assembly Weight (lbs)	1500(2)
No. of Assemblies per DSC	#12 DAMAGED ASSEMBLIES, balance INTACT
Max. U Content (kg)	455.5
Fuel Cladding	Zircaloy-4 or ZIRLO™
RECONSTITUTED FUEL ASSEMBLIES	DAMAGED FUEL Rods replaced by either stainless steel rods (up to 8 rods per assembly) or Zircaloy clad uranium rods (any number of rods per assembly)
Nuclear and Radiological Parameters	
Initial ^{235}U Enrichment (wt %)	Per Table 2-8 and Figure 2-4
Fuel Burnup and Cooling Time	Per Table 2-9, Table 2-10, Table 2-11 and Table 2-12 For RECONSTITUTED FUEL with stainless steel replacement rods per Table 2-13, Table 2-14, Table 2-15 and Table 2-16
Decay Heat	Per Figure 2-1, or Figure 2-2 or Figure 2-3

Notes:

(1) Nominal values shown unless stated otherwise.

(2) Does not include weight of Poison Rodlets (25 lbs each).

Table 2-7 PWR Fuel Assembly Design Characteristics (24PT4-DSC)

Assembly Class	CE 16x16[(1)]
Assembly Length	Table 2-5 or Table 2-6
Max. Initial ^{235}U Enrichment (wt %)	4.85
Fissile Material	UO_2, or $(U, Er)O_2$, or $(U, Gd)O_2$
Number of Rods	236
Fuel Rod Pitch (in)	0.506
Fuel Rod O.D. (in)	0.382
Clad Thickness (in)	0.025
Nominal Pellet O.D., (in)	0.3255[(2)]
Number of Guide Tubes	5

Notes:

(17) Nominal values shown unless stated otherwise.

(18) Bounds pellets with a nominal OD of 0.325".

Table 2-8 Maximum Fuel Enrichment v/s Neutron Poison Requirements for 24PT4-DSC

Storage Configuration	Maximum No. of DAMAGED FUEL ASSEMBLIES(1)	Maximum ^{235}U Fuel Enrichment (wt %)	DSC Basket, Minimum BORAL® Areal Density (gm/cm^2)	Minimum No. of Poison Rodlets Required(2)
All INTACT FUEL ASSEMBLIES	0	4.1	.025 (Type A Basket)	0
	0	4.85	.068 (Type B Basket)	0
Combination of DAMAGED and INTACT FUEL ASSEMBLIES	4	4.1	.025 (Type A Basket)	0
	4	4.85	.068 (Type B Basket)	0
	12	3.7 (DAMAGED) 4.1 (INTACT)	.025 (Type A Basket)	0
	12	4.1 (DAMAGED) 4.85 (INTACT)	.068 (Type B Basket)	0
	12	4.1	.025 (Type A Basket)	1(2) (Located in center guide tube of each INTACT ASSEMBLY)
	12	4.85	.068 (Type B Basket)	5(2) (Located in all five guide tubes of each INTACT ASSEMBLY)

Notes:

(14) See Figure 2-4 for location of DAMAGED FUEL ASSEMBLIES within the 24PT4-DSC basket (Zones A and/or B only).

(15) Poison rodlets are only required for a specific DSC configuration with a payload of 5-12 DAMAGED ASSEMBLIES in combination with maximum fuel enrichment levels as shown. The poison rodlets are to be located within the guide tubes of the inner Zone C INTACT ASSEMBLIES as shown in Figure 2-4.

Table 2-9 PWR Fuel Qualification Table for 1.26 kW per Assembly for the NUHOMS® 24PT4-DSC (Minimum required years of cooling time after reactor core discharge)

BU (GWd MTU)	Initial Enrichment																													
	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
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	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	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	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	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	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	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											5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
41			Not Analyzed								5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
42											6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
43																5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
44																6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5
45																					5	5	5	5	5	5	5	5	5	5	5
48																					6	6	6	6	6	6	6	6	6	6	6
51																					7	7	7	7	6	6	6	6	6	6	6
54																					7	7	7	7	7	7	7	7	7	7	7
57																					8	8	8	8	8	8	8	8	8	8	8
60																					9	9	9	9	9	9	9	9	9	9	9

Notes:

- BU = 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 conservatively applied in determination of actual values for these two parameters.
- This table does not apply to RECONSTITUTED FUEL ASSEMBLIES with stainless steel rods.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment either less than 1.8 or greater than 4.85 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 60 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 4.85 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a five-year cooling time as defined by 4.8 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

Table 2-10 PWR Fuel Qualification Table for 1.2 kW per Assembly for the NUHOMS® 24PT4-DSC (Minimum required years of cooling time after reactor core discharge)

BU (GWd/ MTU)	Initial Enrichment																													
	1.8	1.9	2	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
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	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	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	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	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	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	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											5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
41			Not Analyzed								5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
42											6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
43																6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5
44																6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5
45																					6	6	6	6	6	6	6	6	6	6	6
48																					6	6	6	6	6	6	6	6	6	6	6
51																					7	7	7	7	7	7	7	7	7	7	7
54																					8	8	8	8	8	8	8	8	8	7	7
57																					9	9	9	9	9	9	9	9	8	8	8
60																					10	10	10	10	10	10	10	10	10	10	9

Notes:

- BU = 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 conservatively applied in determination of actual values for these two parameters.
- This table does not apply to RECONSTITUTED FUEL ASSEMBLIES with stainless steel rods.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment either less than 1.8 or greater than 4.85 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 60 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 4.85 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a five-year cooling time as defined by 4.8 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

Table 2-11 PWR Fuel Qualification Table for 1.0 kW per Assembly for the NUHOMS® 24PT4-DSC (Minimum required years of cooling time after reactor core discharge)

BU (GWd/ MTU)	Initial Enrichment																													
	1.8	1.9	2	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
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	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	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	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	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	5	5	5	5	5	5	5
36	6	6	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	5	5	5	5
38											6	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5
39											6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5
40											6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
41			Not Analyzed								6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
42											7	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
43																7	7	7	7	7	7	7	6	6	6	6	6	6	6	6	6
44																7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6
45																					7	7	7	7	7	7	7	7	7	7	7
48																					8	8	8	8	8	8	8	8	8	8	8
51																					9	9	9	9	9	9	9	9	9	9	9
54																					11	11	11	11	11	10	10	10	10	10	10
57																					13	13	13	13	12	12	12	12	12	12	12
60																					15	15	15	15	15	15	15	14	14	14	14

Notes:

- BU = 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 conservatively applied in determination of actual values for these two parameters.
- This table does not apply to RECONSTITUTED FUEL ASSEMBLIES with stainless steel rods.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment either less than 1.8 or greater than 4.85 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 60 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 4.85 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a six-year cooling time as defined by 4.8 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

Table 2-12 PWR Fuel Qualification Table for 0.9 kW per Assembly for the NUHOMS® 24PT4-DSC (Minimum required years of cooling time after reactor core discharge)

BU (GWd/ MTU)	Initial Enrichment																													
	1.8	1.9	2	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
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	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	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	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	5	5	5	5	5	5
34	6	6	6	6	6	6	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
36	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	5	5	5
38											6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
39											7	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
40											7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6	6
41			Not Analyzed								7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
42											8	8	8	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
43																8	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7
44																8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7
45																					8	8	8	8	8	8	8	8	8	8	8
48																					10	10	9	9	9	9	9	9	9	9	9
51																					11	11	11	11	11	11	11	11	11	11	11
54																					14	14	14	13	13	13	13	13	13	13	13
57																					17	16	16	16	16	16	16	16	15	15	15
60																					20	19	19	19	19	19	19	18	18	18	18

Notes:

- BU = 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 conservatively applied in determination of actual values for these two parameters.
- This table does not apply to RECONSTITUTED FUEL ASSEMBLIES with stainless steel rods.
- Round burnup UP to next higher entry, round enrichments DOWN to next lower entry.
- Fuel with an initial enrichment either less than 1.8 or greater than 4.85 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 60 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 4.85 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a seven-year cooling time as defined by 4.8 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

Table 2-13 PWR Fuel Qualification Table for 1.26 kW per Assembly for the NUHOMS® 24PT4-DSC, Reconstituted Fuel with Stainless Steel Rods

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

BU (GWd/ MTU)	Initial Enrichment																													
	1.8	1.9	2	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
10	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	7	7	7	7
15	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	7	7	7	7
20	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	7	7	7	7
25	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	7	7	7	7
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	7	7	7	7
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	7	7	7	7	7
32	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	7	7	7	7
34	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	7	7	7	7
36	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	7	7	7	7
38											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
39											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
40											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
41			Not Analyzed								7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
42											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
43																7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
44																7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
45																					7	7	7	7	7	7	7	7	7	7	7
48																					8	8	8	8	8	8	8	8	8	8	8
51																					8	8	8	8	8	8	8	8	8	8	8
54																					9	9	9	9	9	9	9	9	9	9	9
57																					10	10	10	10	10	10	10	10	10	10	10
60																					12	12	12	12	12	12	12	12	12	12	12

Notes:

- BU = Assembly average burnup.
- This table is to be used only for RECONSTITUTED FUEL ASSEMBLIES.
- 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 either less than 1.8 or greater than 4.85 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 60 GWd/MTU is unacceptable for storage.
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 7-years cooling.
- Example: An assembly with an initial enrichment of 4.85 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a seven-year cooling time as defined by 4.8 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

Table 2-14 PWR Fuel Qualification Table for 1.2 kW per Assembly for the NUHOMS® 24PT4-DSC, Reconstituted Fuel with Stainless Steel Rods

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

BU (GWd/ MTU)	Initial Enrichment																													
	1.8	1.9	2	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
10	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	7	7	7	7
15	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	7	7	7	7
20	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	7	7	7	7
25	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	7	7	7	7
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	7	7	7	7
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	7	7	7	7	7
32	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	7	7	7	7
34	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	7	7	7	7
36	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	7	7	7	7
38											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
39											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
40											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
41			Not Analyzed								7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
42											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
43																7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
44																7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
45																					7	7	7	7	7	7	7	7	7	7	7
48																					8	8	8	8	8	8	8	8	8	8	8
51																					8	8	8	8	8	8	8	8	8	8	8
54																					9	9	9	9	9	9	9	9	9	9	9
57																					10	10	10	10	10	10	10	10	10	10	10
60																					12	12	12	12	12	12	12	12	12	12	12

Notes:

- BU = Assembly average burnup.
- This table is to be used only for RECONSTITUTED FUEL ASSEMBLIES.
- 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 either less than 1.8 or greater than 4.85 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 60 GWd/MTU is unacceptable for storage.
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 7-years cooling.
- Example: An assembly with an initial enrichment of 4.85 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a seven-year cooling time as defined by 4.8 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

Table 2-15 PWR Fuel Qualification Table for 1.0 kW per Assembly for the NUHOMS® 24PT4-DSC, Reconstituted Fuel with Stainless Steel Rods

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

BU (GWd/ MTU)	Initial Enrichment																													
	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
10	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	7	7	7	7
15	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	7	7	7	7
20	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	7	7	7	7
25	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	7	7	7	7
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	7	7	7	7
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	7	7	7	7	7
32	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	7	7	7	7
34	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	7	7	7	7
36	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	7	7	7	7
38											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
39											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
40											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
41				Not Analyzed							7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
42											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
43																7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
44																7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
45																					7	7	7	7	7	7	7	7	7	7	7
48																					8	8	8	8	8	8	8	8	8	8	8
51																					9	9	9	9	9	9	9	9	9	9	9
54																					11	11	11	11	11	10	10	10	10	10	10
57																					13	13	13	13	12	12	12	12	12	12	12
60																					15	15	15	15	15	15	15	14	14	14	14

Notes:

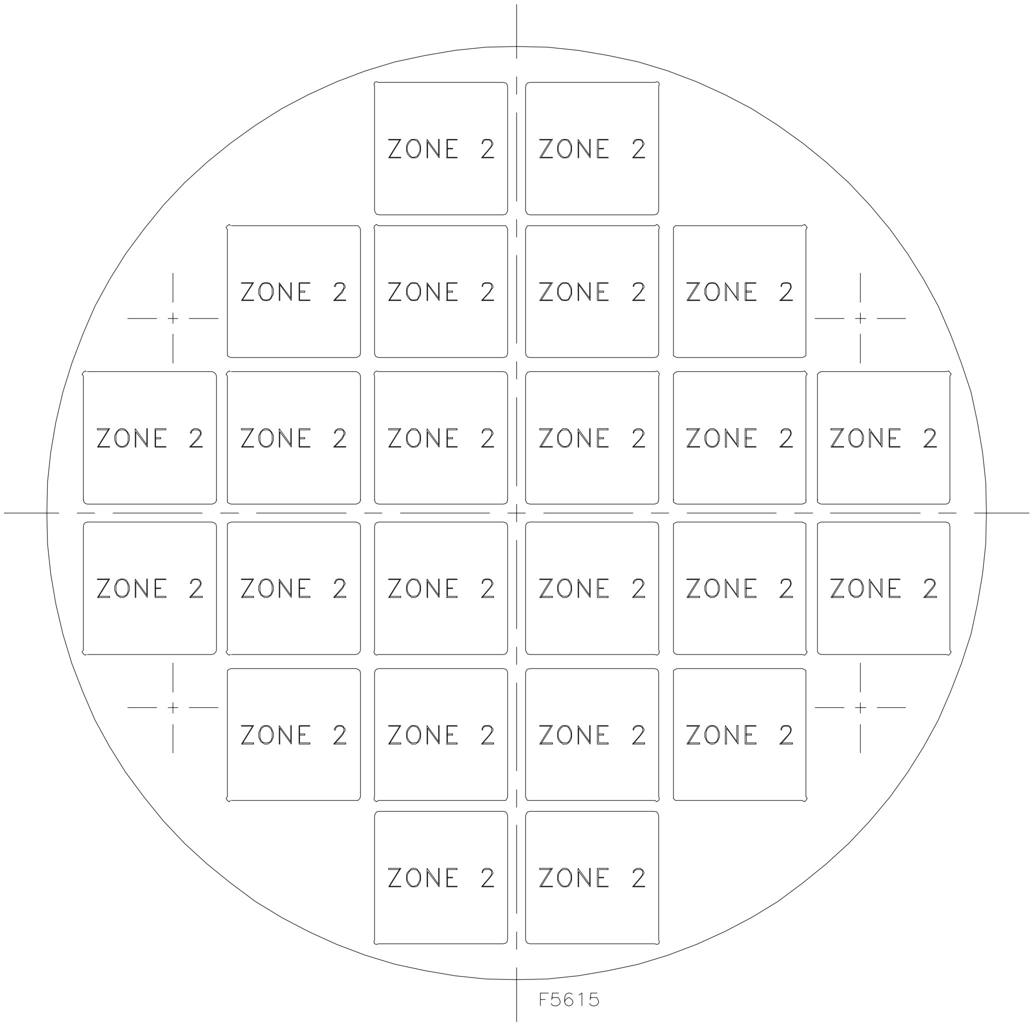
- BU = Assembly average burnup.
- This table is to be used only for RECONSTITUTED FUEL ASSEMBLIES.
- Use burnup and enrichment to lookup minimum cooling time in years. Licensee is responsible for ensuring that uncertainties in fuel enrichment and burnup are conservatively applied in determination of 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 either less than 1.8 or greater than 4.85 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 60 GWd/MTU is unacceptable for storage.
- Fuel with a burnup less than 10 GWd/MTU is acceptable for storage after 7-years cooling.
- Example: An assembly with an initial enrichment of 4.85 wt. % U-235 and a burnup of 41.5 GWd/MTU is acceptable for storage after a seven-year cooling time as defined by 4.8 wt. % U-235 (rounding down) and 42 GWd/MTU (rounding up) on the qualification table.

Table 2-16 PWR Fuel Qualification Table for 0.9 kW per Assembly for the NUHOMS® 24PT4-DSC, Reconstituted Fuel with Stainless Steel Rods
(Minimum required years of cooling time after reactor core discharge)

BU (GWd/ MTU)	Initial Enrichment																														
	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
10	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	7	7	7	7
15	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	7	7	7	7
20	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	7	7	7	7
25	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	7	7	7	7
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	7	7	7	7
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	7	7	7	7	7
32	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	7	7	7	7
34	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	7	7	7	7
36	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	7	7	7	7
38											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
39											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
40											7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
41			Not Analyzed								7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
42											8	8	8	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
43																8	8	8	8	8	7	7	7	7	7	7	7	7	7	7	7
44																8	8	8	8	8	8	8	8	8	8	8	8	8	8	7	7
45																					8	8	8	8	8	8	8	8	8	8	8
48																					10	10	9	9	9	9	9	9	9	9	9
51																					11	11	11	11	11	11	11	11	11	11	11
54																					14	14	14	13	13	13	13	13	13	13	13
57																					17	16	16	16	16	16	16	16	15	15	15
60																					20	19	19	19	19	19	19	18	18	18	18

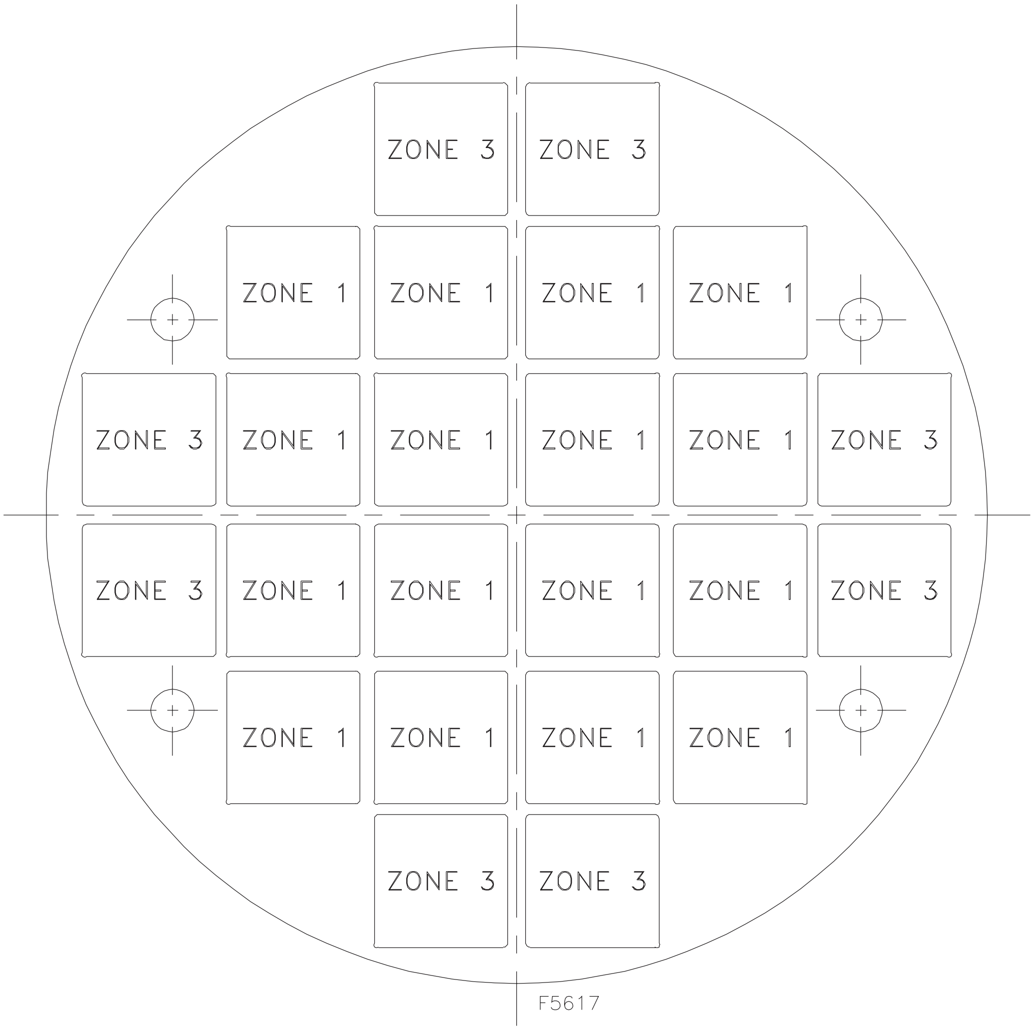
Notes:

- BU = Assembly average burnup.
- This table is to be used only for RECONSTITUTED FUEL ASSEMBLIES.
- 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 either less than 1.8 or greater than 4.85 wt.% U-235 is unacceptable for storage.
- Fuel with a burnup greater than 60 GWd/MTU is unacceptable for storage.
- Fuel with a burnup less than 10 GWd/MTU and is acceptable for storage after 7-years cooling.
- Example: An assembly with an initial enrichment of 4.85 wt. % U-235 and a burnup of 47 GWd/MTU is acceptable for storage after a nine-year cooling time as defined by 4.8 wt. % U-235 (rounding down) and 48 GWd/MTU (rounding up) on the qualification table.



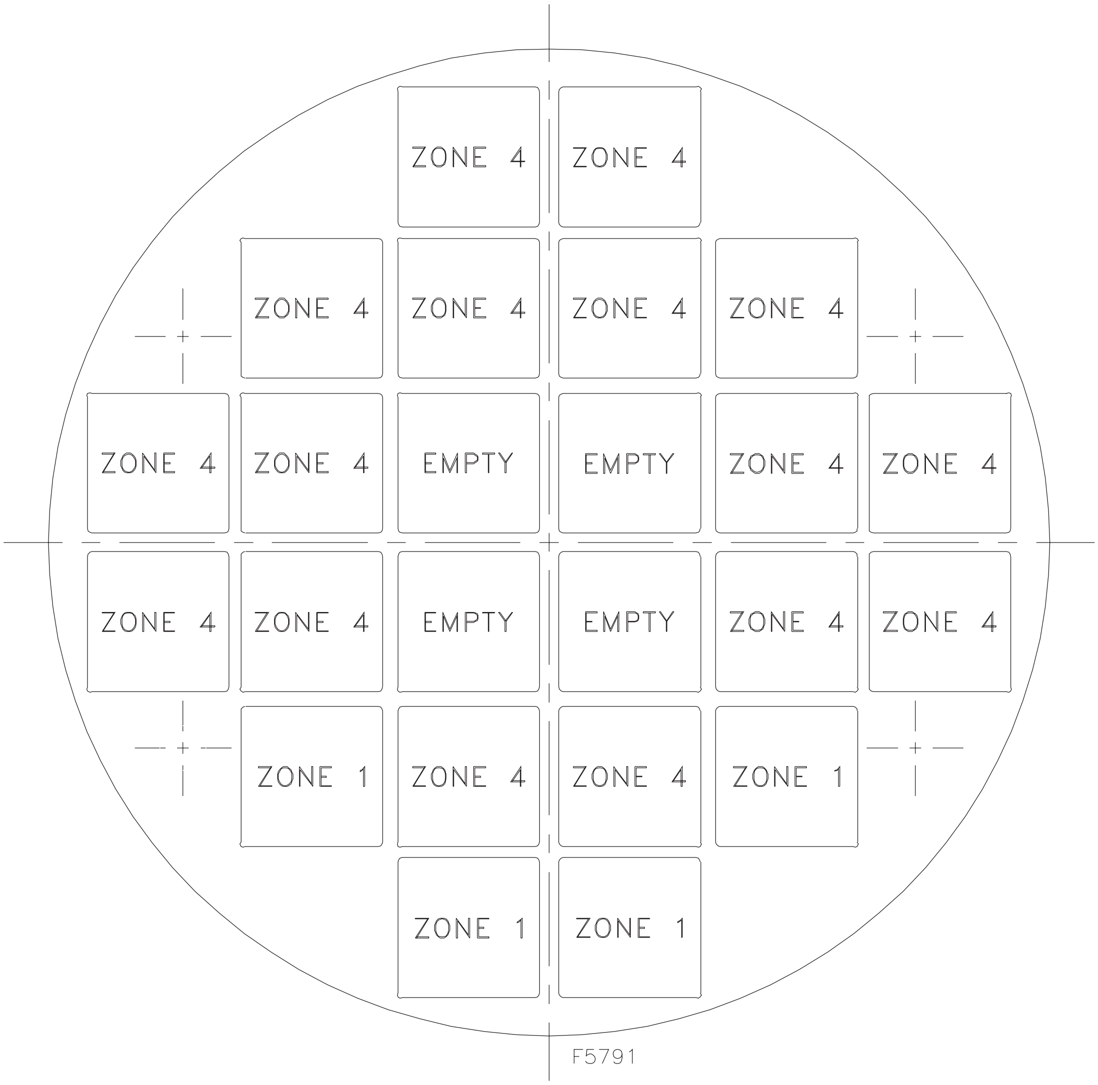
	Zone 1	Zone 2	Zone 3	Zone 4
Maximum Decay Heat (kWatts / FA)	**NA**	**1.0**	**NA**	**NA**
Maximum Decay Heat per Zone (kWatts)	**NA**	**24.0**	**NA**	**NA**

Figure 2-1 24PT4-DSC Heat Load Configuration #1, kW/Assembly



Maximum Decay Heat (kWatts / FA)	**0.9**	**NA**	**1.2**	**NA**
Maximum Decay Heat per Zone (kWatts)	**14.4**	**NA**	**9.6**	**NA**

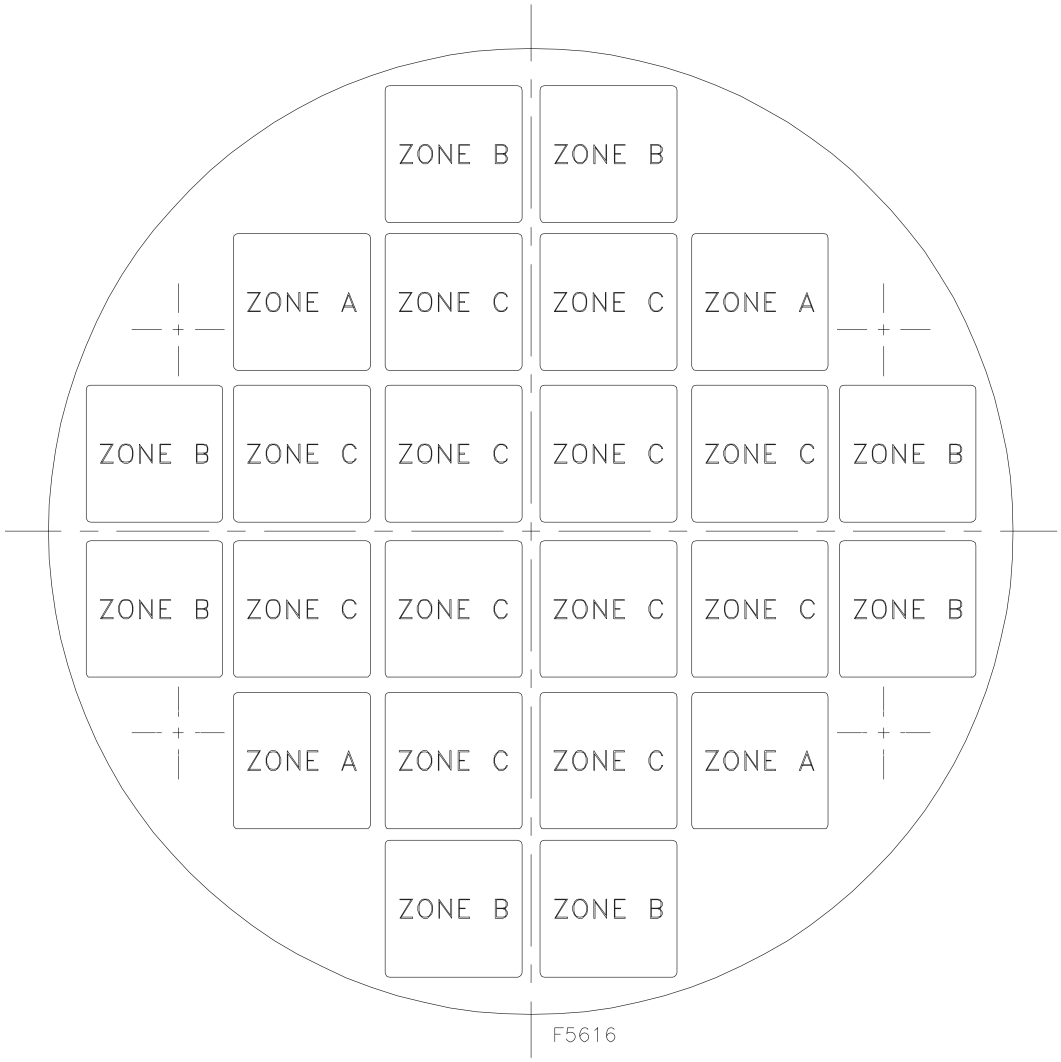
Figure 2-2 24PT4-DSC Heat Load Configuration #2, kW/Assembly



	Zone 1	Zone 2	Zone 3	Zone 4
Maximum Decay Heat (kWatts / FA)	**0.9**	**NA**	**NA**	**1.26**
Maximum Decay Heat per Zone (kWatts)	**3.6**	**NA**	**NA**	**20.16**

Note: FUEL ASSEMBLIES with a heat load of 0.9 kW (Zone 1) may also be placed anywhere in Zone 4.

Figure 2-3 24PT4-DSC Heat Load Configuration #3, kW/Assembly



Notes:

1. Locations identified as Zone A are for placement of up to 4 DAMAGED FUEL ASSEMBLIES.
2. Locations identified as Zone B are for placement of up to 8 additional DAMAGED FUEL ASSEMBLIES (Maximum of 12 DAMAGED FUEL ASSEMBLIES allowed, Zones A and B combined).
3. Locations identified as Zone C are for placement of up to 12 intact FUEL ASSEMBLIES, including 4 empty slots in the center as shown in Figure 2-3.
4. Poison Rodlets are to be located in the guide tubes of intact FUEL ASSEMBLIES placed in Zone C only per Table 2-4.

Figure 2-4 Location of FAILED FUEL CANS inside 24PT4-DSC

LCO 3.0.1	LCOs shall be met during specified conditions in the Applicability, except as provided in LCO 3.0.2.
LCO 3.0.2	Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met, except as provided in LCO 3.0.5. If the LCO is met or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated.
LCO 3.0.3	Not applicable to a spent fuel storage cask.
LCO 3.0.4	When an LCO is not met, entry into a specified condition in the Applicability shall not be made except when the associated ACTIONS to be entered permit continued operation in the specified condition in the Applicability for an unlimited period of time. This Specification shall not prevent changes in specified conditions in the Applicability that are required to comply with ACTIONS, or that are related to the unloading of a 24PT1-DSC or 24PT4-DSC. Exceptions to this Specification are stated in the individual Specifications. These exceptions allow entry into specified conditions in the Applicability when the associated ACTIONS to be entered allow operation in the specified condition in the Applicability only for a limited period of time.
LCO 3.0.5	Equipment removed from service or not in service in compliance with ACTIONS may be returned to service under administrative control solely to perform testing required to demonstrate it meets the LCO or that other equipment meets the LCO. This is an exception to LCO 3.0.2 for the system returned to service under administrative control to perform the testing required to demonstrate that the LCO is met.
LCO 3.0.6	Not applicable to a spent fuel storage cask.
LCO 3.0.7	Not applicable to a spent fuel storage cask.

SR 3.0.1

SRs shall be met during the specified conditions in the Applicability for individual LCOs, unless otherwise stated in the SR. Failure to meet a Surveillance, whether such failure is experienced during the performance of the Surveillance or between performances of the Surveillance, shall be failure to meet the LCO. Failure to perform a Surveillance within the specified Frequency shall be failure to meet the LCO except as provided in SR 3.0.3. Surveillances do not have to be performed on equipment or variables outside specified limits.

SR 3.0.2

The specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met.

For Frequencies specified as "once," the above interval extension does not apply. If a Completion Time requires periodic performance on a "once per . . ." basis, the above Frequency extension applies to each performance after the initial performance.

Exceptions to this Specification are stated in the individual Specifications.

SR 3.0.3

If it is discovered that a Surveillance was not performed within its specified Frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever is less. This delay period is permitted to allow performance of the Surveillance.

If the Surveillance is not performed within the delay period, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered.

When the Surveillance is performed within the delay period and the Surveillance is not met, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered.

SR 3.0.4

Entry into a specified condition in the Applicability of an LCO shall not be made unless the LCO's Surveillances have been met within their specified Frequency. This provision shall not prevent entry into specified conditions in the Applicability that are required to comply with ACTIONS or that are related to the unloading of a DSC.

3.1 DSC Integrity

3.1.1.a <u>24PT1-DSC Vacuum Drying Time (Duration) and Pressure</u>

LCO 3.1.1.a Duration: Vacuum Drying of the 24PT1-DSC shall be achieved with the following time durations after the start of bulk water removal (blowdown):

Heat Load (kW)	Time Limit
kW # 12	No limit
12 < kW # 13	71 Hours
13 < kW # 14	54 Hours

Pressure: The 24PT1-DSC vacuum drying pressure shall be sustained at or below 3 Torr (3 mm Hg) absolute for a period of at least 30 minutes following stepped evacuation.

APPLICABILITY: During LOADING OPERATIONS.

ACTIONS

-------------------------------- NOTE -----------------------------------

This specification is applicable to all 24PT1-DSCs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. 24PT1-DSC vacuum drying pressure limit not met within 47 hours for a DSC with heat load greater than 12 kW and $\leq$ 13 kW or within 30 hours for a DSC with heat load greater than 13 kW and $\leq$ 14 kW.	A.1 Establish helium pressure of at least 1 atm and no greater than 20 psig in the 24PT1-DSC.	24 hours
	<u>OR</u>	
	A.2 Flood the 24PT1-DSC with water submerging all FUEL ASSEMBLIES.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.a.1	Verify that the 24PT1-DSC vacuum pressure is less than, or equal to, 3 Torr (3 mm Hg) absolute for at least 30 minutes, within the specified total time duration based on heat load.	Once per 24PT1-DSC, after an acceptable NDE of the inner top cover plate weld.

3.1.1.b 24PT4-DSC Vacuum Drying Time (Duration) and Pressure

LCO 3.1.1.b Duration: Vacuum Drying of the 24PT4-DSC shall be achieved within the following durations (depending upon the 24PT4-DSC specific heat load configuration) following completion of blowdown using air. No time limits apply for vacuum drying of 24PT4-DSC if helium is used for blowdown. Transfer between air and helium blowdown within the time limits specified below is acceptable. Blowdown with helium with a volume equal to the DSC free volume is required within the air time limit.

Heat Load Configuration	Time Limit Using Air	Time Limit Using Helium
1	35 Hours	No Limit
2	35 Hours	No Limit
3	26 Hours	No Limit

Pressure: The 24PT4-DSC vacuum drying pressure shall be sustained at or below 3 Torr (3 mm Hg) absolute for a period of at least 30 minutes following stepped evacuation.

APPLICABILITY: During LOADING OPERATIONS.

ACTIONS

-------------------------------- NOTE ----------------------------------
This specification is applicable to all 24PT4-DSCs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. 24PT4-DSC vacuum drying pressure limit not met when using air for blowdown within 33 hours (Configurations #1 or 2) or 24 hours (Configuration #3).	A.1 Establish helium pressure of at least 1 atm and no greater than 20 psig in the 24PT4-DSC. Vacuum drying can proceed with no time limit.	2 hours
	OR	
	A.2 Flood the 24PT4-DSC with water submerging all FUEL ASSEMBLIES.	2 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.b.1	Verify that the 24PT4-DSC vacuum pressure is less than, or equal to, 3 Torr (3 mm Hg) absolute for at least 30 minutes, within the specified total time duration based on heat load.	Once per 24PT4-DSC, after an acceptable NDE of the inner top cover plate weld.

3.1.2.a 24PT1-DSC Helium Backfill Pressure

LCO 3.1.2.a 24PT1-DSC helium backfill pressure shall be 1.5 ± 1.5 psig (stable for 30 minutes after filling).

APPLICABILITY: During LOADING OPERATIONS.

ACTIONS

------------------------------------ NOTE ----------------------------------

This specification is applicable to all 24PT1-DSCs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
Note: Not applicable until SR 3.1.2.a.1 is performed. A. The required backfill pressure cannot be obtained or stabilized.	A.1 Establish the 24PT1-DSC helium backfill pressure to within the limit. OR A.2 Flood the 24PT1-DSC with water submerging all fuel assemblies.	24 hours 24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.a.1	Verify that the 24PT1-DSC helium backfill pressure is 1.5 ± 1.5 psig.	Once per 24PT1-DSC, after the completion of TS 3.1.1.a actions.

3.1.2.b 24PT4-DSC Helium Backfill Pressure

LCO 3.1.2.b 24PT4-DSC helium backfill pressure shall be 6.0 + 1.0 / -0.0 psig (stable for 30 minutes after filling).

APPLICABILITY: During LOADING OPERATIONS.

ACTIONS

------------------------------------ NOTE -----------------------------------

This specification is applicable to all 24PT4-DSCs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
Note: Not applicable until SR 3.1.2.b.1 is performed.		
A. The required backfill pressure cannot be obtained or stabilized.	A.1 Establish the 24PT4-DSC helium backfill pressure to within the limit.	24 hours
	OR	
	A.2 Re-initiate vacuum drying.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.2.b.1 Verify that the 24PT4-DSC helium backfill pressure is 6.0 + 1.0 / -0.0 psig.	Once per 24PT4-DSC, after the completion of TS 3.1.1.b actions.

4.0 Design Features

The specifications in this section include the design characteristics of special importance to each of the physical barriers and to maintenance of safety margins in the Advanced NUHOMS® System design. The principal objective of this section is to describe the design envelope that may constrain any physical changes to essential equipment. Included in this section are the site environmental parameters that provide the bases for design, but are not inherently suited for description as LCOs.

4.1 Site

4.1.1 Site Location

Because this FSAR is prepared for a general license, a discussion of a site-specific ISFSI location is not applicable.

4.2 Storage System Features

4.2.1 Storage Capacity

The total storage capacity of the ISFSI is governed by the plant-specific license conditions.

4.2.2 Storage Pad

For sites for which soil-structure interaction is considered important, the licensee is to perform site-specific analysis considering the effects of soil-structure interaction. Amplified seismic spectra at the location of the AHSM center of gravity (CG) is to be developed based on the SSI responses. The AHSM center of gravity is shown in Table 3.2-1. The site-specific spectra at the AHSM CG must be bounded by the spectra presented in Chapter 2.

The storage pad location shall have no potential for liquefaction at the site-specific SSE level earthquake.

Additional requirements for the pad configuration are provided in Section 4.4.2.

4.2.3 Canister Neutron Absorber

For a 24PT1-DSC basket, neutron absorber with a minimum ^{10}B loading of 0.025 grams/square centimeter is provided for criticality control.

For a 24PT4-DSC basket, two alternate neutron absorber specifications are provided for criticality control depending upon the number of DAMAGED ASSEMBLIES and/or the maximum fuel enrichment of the payload as shown in Table 2-8:

- Type A Basket (minimum areal ^{10}B loading of 0.025 gm/cm^2)
- Type B Basket (minimum areal ^{10}B loading of 0.068 gm/cm^2)

4.2.4 Canister Flux Trap Configuration

The canister flux trap configuration is defined by the spacer disc ligament width dimensions. Figure 4-1 (applicable to 24PT1-DSC and 24PT4-DSC) shows the location and dimensions of the ligaments (the dimensions shown in the one quadrant are applicable to all four quadrants).

4.2.5 Fuel Spacers

Bottom fuel spacers are required to be located at the bottom of the DSC below each FUEL ASSEMBLY stored in the 24PT1-DSC. Top fuel spacers are required to be located above each INTACT FUEL ASSEMBLY stored in the 24PT1-DSC (the FAILED FUEL CAN design includes an integral top fuel spacer and therefore does not require a top fuel spacer).

No fuel spacers are required for 24PT4-DSC.

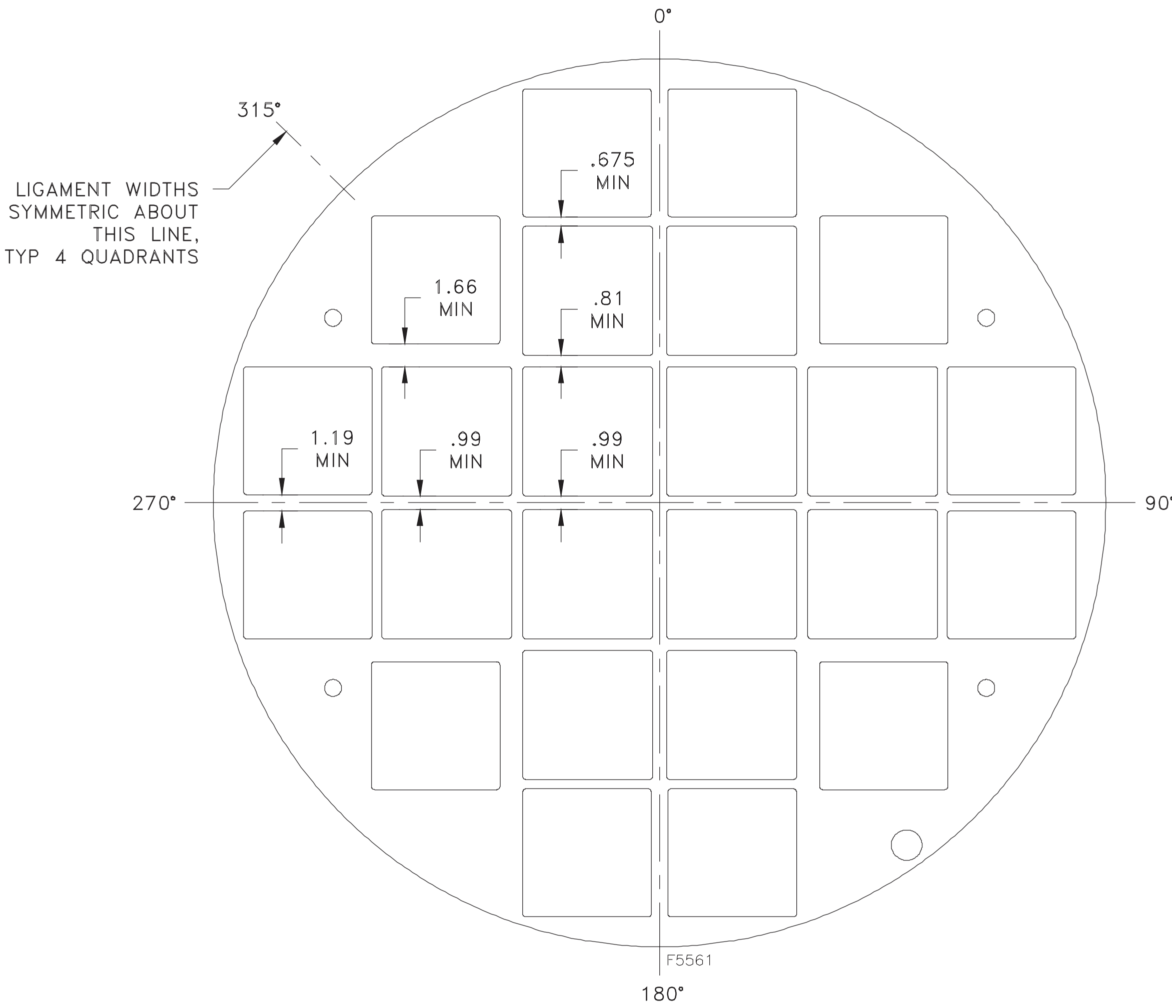


Figure 4-1   Minimum Spacer Disc Ligament Widths

4.3 Codes and Standards

4.3.1 Advanced Horizontal Storage Module (AHSM)

The reinforced concrete AHSM is designed to meet the requirements of ACI 349-97. Load combinations specified in ANSI 57.9-1984, Section 6.17.3.1 are used for combining normal operating, off-normal, and accident loads for the AHSM.

4.3.2 Dry Shielded Canister, 24PT1-DSC or 24PT4-DSC (DSC)

The DSC is designed fabricated and inspected to the maximum practical extent in accordance with ASME Boiler and Pressure Vessel Code Section III, Division 1, 1992 Edition with Addenda through 1994, including exceptions allowed by Code Case –595-1, Subsections NB, NF, and NG for Class 1 components and supports. In addition, Code Case –499-1 applies to 24PT4-DSC spacer discs. Code Alternatives are discussed in 4.3.4.

4.3.3 Transfer Cask

The TRANSFER CASK (OS197 or OS197H) shall meet the codes and standards that are applicable to its design under Certificate of Compliance C of C 1004.

A solar shield is required for cask TRANSFER OPERATIONS at temperatures exceeding 100ºF.

4.3.4 Alternatives to Codes and Standards

ASME Code alternatives for the 24PT1-DSC or 24PT4-DSC (DSC) are listed below:

DSC Shell Assembly Alternatives to ASME Code, Subsection NB

Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
NCA	All	Not compliant with NCA
NB-1100	Requirements for Code Stamping of Components	The DSC shell is designed & fabricated in accordance with the ASME Code, Section III, Subsection NB to the maximum extent practical. However, Code Stamping is not required. As Code Stamping is not required, the fabricator is not required to hold an ASME "N" or "NPT" stamp, or to be ASME Certified.
NB-2130 NB-4121	Material must be supplied by ASME approved material suppliers Material Certification by Certificate Holder	All materials designated as ASME on the FSAR drawings are obtained from ASME approved MM or MS supplier(s) with ASME CMTR's. Material is certified to meet all ASME Code criteria but is not eligible for certification or Code Stamping if a non-ASME fabricator is used. As the fabricator is not required to be ASME certified, material certification to NB-2130 is not possible. Material traceability & certification are maintained in accordance with TN's NRC approved QA program.

Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
NB-6111	All completed pressure retaining systems shall be pressure tested	The shield plug support ring and vent and siphon block are not pressure tested due to the manufacturing sequence. The support ring is not a pressure-retaining item and the siphon block weld is helium leak tested after fuel is loaded and the inner top closure plate installed in accordance with Code Case N-595-1.
NB-7000	Overpressure Protection	No overpressure protection is provided for the DSC. The function of the DSC is to contain radioactive materials under normal, off-normal and hypothetical accident conditions postulated to occur during transportation and storage. The DSC is designed to withstand the maximum internal pressure considering 100% fuel rod failure at maximum accident temperature. The DSC is pressure tested to 120% of normal operating design pressure. An overpressure protection report is not prepared for the DSC.
NB-8000	Requirements for nameplates, stamping & reports per NCA-8000	The DSC nameplate provides the information required by 10CFR71, 49CFR173 and 10CFR72 as appropriate. Code stamping is not required for the DSC. In lieu of code stamping, QA Data packages are prepared in accordance with the requirements of 10CFR71, 10CFR72 and TN's approved QA program.

Basket Alternatives to ASME Code, Subsection NG/NF

Reference ASME Code Section/Article	**Code Requirement**	**Alternative, Justification & Compensatory Measures**
NCA	All	Not compliant with NCA
NG/NF-1100	Requirements for Code Stamping of Components	The DSC baskets are designed & fabricated in accordance with the ASME Code, Section III, Subsection NG/NF to the maximum extent practical as described in the FSAR, but Code Stamping is not required. As Code Stamping is not required, the fabricator is not required to hold an ASME N or NPT stamp or be ASME Certified.
NG/NF-2130 NG/NF-4121	Material must be supplied by ASME approved material suppliers Material Certification by Certificate Holder	All materials designated as ASME on the FSAR drawings are obtained from ASME approved MM or MS supplier with ASME CMTR's. Material is certified to meet all ASME Code criteria but is not eligible for certification or Code Stamping if a non-ASME fabricator is used. As the fabricator is not required to be ASME certified, material certification to NG/NF-2130 is not possible. Material traceability & certification are maintained in accordance with TN's NRC approved QA program.
Table NG-3352-1	Permissible Joint Efficiency Factors	Joint efficiency (quality) factor of 1 is assumed for the guidesleeve longitudinal weld. Table NG-3352-1 permits a quality factor of 0.5 for full penetration weld with visual inspection. Inspection of both faces provides n= (2*0.5)=1. This is justified by this gauge of material (0.12 inch) with visual examination of both surfaces which ensures that any significant deficiencies would be observed and corrected.

Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
NG/NF-8000	Requirements for nameplates, stamping & reports per NCA-8000	The DSC nameplate provides the information required by 10CFR71, 49CFR173 and 10CFR72 as appropriate. Code stamping is not required for the DSC. In lieu of code stamping, QA Data packages are prepared in accordance with the requirements of 10CFR71, 10CFR72 and TN's approved QA program.
N/A	N/A	Oversleeve to guidesleeve welds are non-code welds which meet the requirements of AWS D1.3-98, the Structural Welding Code-Sheet Steel.
NG-3000 / Section II, Part D, Table 2A	Maximum temperature limit for Type 304 plate material is 800ºF	For 24PT4-DSC only: The DSC guidesleeves, oversleeves and failed fuel cans do not comply with ASME Code limit of 800ºF for Type 304 steel for the postulated blocked vent accident for approximately 25 hours. The maximum predicted temperature of those components for this event is less than 900ºF. In accordance with Table I-14.5 of Article NH, the expected reduction in material strength is small (less than 1 ksi) and the calculated stress ratio is very small.

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

1. The proposed alternatives would provide an acceptable level of quality and safety, or

2. Compliance with the specified requirements of ASME Code, Section III, 1992 Edition with Addenda through 1994 would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Requests for alternatives in accordance with this section should be submitted in accordance with 10CFR 72.4.

4.4 Storage Location Design Features

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

4.4.1 Storage Configuration

AHSMs are to be tied together in single rows or back to back arrays with not less than 3 modules tied together (side by side). Any 2 of the 3 modules may be empty (not contain a loaded DSC). Each group of modules not tied together must be separated from other groups by a minimum of 20 feet to accommodate possible sliding during a seismic event. The distance between any module and the edge of the ISFSI pad shall be no less than 10 feet.

4.4.2 Concrete Storage Pad Properties to Limit DSC Gravitational Loadings Due to Postulated Drops

The TC/DSC has been evaluated for drops of up to 80 inches onto a reinforced concrete storage pad. The evaluations are based on the concrete parameters specified in EPRI Report NP-4830, "The Effects of Target Hardness on the Structural Design of Concrete Storage Pads for Spent Fuel Casks," October 1986.

4.4.3 Site Specific Parameters and Analyses

The following parameters and analyses shall be verified by the system user for applicability at their specific site.

1. Tornado maximum wind speeds: 290 mph rotational
   70 mph translational

2. Flood levels up to 50 ft. and water velocity of 15 fps.

3. One-hundred year roof snow load of 110 psf.

4. Normal ambient temperatures of 0°F to 104°F.

5. Off-normal ambient temperature range of –40°F without solar insolation to 117°F with full solar insolation.

6. The potential for fires and explosions shall be addressed, based on site-specific considerations.

7. Supplemental Shielding: In cases where engineered features (i.e., berms, shield walls) are used to ensure that the requirements of 10CFR 72.104(a) are met, such features are to be considered important to safety and must be evaluated to determine the applicable Quality Assurance Category.

8. Seismic restraints shall be provided to prevent overturning of a loaded TC in a vertical orientation in the plant's decontamination area 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.

9. The effects of lightning, tsunamis, hurricanes and seiches, based on site-specific conditions shall be shown to be bounded by the design capability of the storage cask system.

5.0 Administrative Controls

5.1 Procedures

Each user of the Advanced NUHOMS® System will prepare, review, and approve written procedures for all normal operations, maintenance, and testing at the ISFSI prior to its operation. Written procedures shall be established, implemented, and maintained covering the following activities that are important to safety:

- Organization and management
- Routine ISFSI operations
- Alarms and annunciators
- Emergency operations
- Design control and facility change/modification
- Control of surveillances and tests
- Control of special processes
- Maintenance
- Health physics, including ALARA practices
- Special nuclear material accountability
- Quality assurance, inspection, and audits
- Physical security and safeguards
- Records management
- Reporting
- All programs specified in Section 5.2

5.2 Programs

Each user of the Advanced NUHOMS® System will implement the following programs to ensure the safe operation and maintenance of the ISFSI:

- Safety Review Program
- Training Program
- Radiological Environmental Monitoring Program
- Radiation Protection Program
- AHSM Thermal Monitoring Program

5.2.1 Safety Review Program

Users shall conduct safety reviews in accordance with 10CFR 72.48 to determine whether proposed changes, tests, and experiments require NRC approval before implementation. Changes to the Technical Specification Bases and other licensing basis documents will be conducted in accordance with approved administrative procedures. Changes may be made to Technical Specification Bases and other licensing basis documents without prior NRC approval, provided the changes meet the criteria of 10CFR 72.48.

The safety review process will contain provisions to ensure that the Technical Specification Bases and other licensing basis documents are maintained consistent with the FSAR.

Proposed changes that do not meet the criteria above will be reviewed and approved by the NRC before implementation. Changes to the Technical Specification Bases implemented without prior NRC approval will be provided to the NRC in accordance with 10CFR 72.48.

5.2.2 Training Program

Training modules shall be developed as required by 10CFR 72. Training modules shall require a comprehensive program for the operation and maintenance of the Advanced NUHOMS® System and the INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI). The training modules shall include the following elements, at a minimum:

- Advanced NUHOMS® System design (overview)
- ISFSI Facility design (overview)
- Systems, Structures, and Components Important to Safety (overview)
- Advanced NUHOMS® System Safety Analysis Report (overview)
- NRC Safety Evaluation Report (overview)
- Certificate of Compliance conditions
- Advanced NUHOMS® System Technical Specifications
- Applicable Regulatory Requirements (e.g., 10CFR 72, Subpart K, 10CFR 20, 10 CFR Part 73)
- Required Instrumentation and Use
- Operating Experience Reviews
- Advanced NUHOMS® System and Maintenance procedures, including:
  - Fuel qualification and loading,
  - Rigging and handling,
  - LOADING OPERATIONS as described in Chapters 8, A.8, and Sections 9.2 and A.9.2 of the FSAR,
  - UNLOADING OPERATIONS including reflooding,
  - Auxiliary equipment operations and maintenance (i.e., welding operations, vacuum drying, helium backfilling and leak testing, reflooding),
  - TRANSFER OPERATIONS including loading and unloading of the Transfer Vehicle,
  - ISFSI Surveillance operations,
  - Radiation Protection,
  - Maintenance,
  - Security,
  - Off-normal and accident conditions, responses and corrective actions.

5.2.3 Radiological Environmental Monitoring Program

a) A radiological environmental monitoring program will be implemented to ensure that the annual dose equivalent to an individual located outside the ISFSI controlled area does not exceed the annual dose limits specified in 10CFR 72.104(a).

b) Operation of the ISFSI will not create any radioactive materials or result in any credible liquid or gaseous effluent release.

c) In accordance with 10CFR 72.212(b)(2), a periodic report will be submitted by the licensee that specifies the quantity of each of the principal radionuclides released to the environment in liquid and gaseous effluents during the previous year of operation.

5.2.4 Radiation Protection Program

The Radiation Protection Program will establish administrative controls to limit personnel exposure to As Low As Reasonably Achievable (ALARA) levels in accordance with 10CFR Part 20 and Part 72.

a. As part of its evaluation pursuant to 10CFR 72.212, the licensee shall perform an analysis to confirm that the limits of 10CFR 20 and 10CFR 72.104 will be satisfied under the actual site conditions and configurations considering the planned number of DSCs to be used and the planned fuel loading conditions.

b. A monitoring program to ensure the annual dose equivalent to any real individual located outside the ISFSI controlled area does not exceed regulatory limits is incorporated as part of the environmental monitoring program in the Radiological Environmental Monitoring Program of Section 5.2.3.

c. Following placement of each loaded TRANSFER CASK into the cask decontamination area and prior to transfer to the ISFSI, the DSC smearable surface contamination levels on the outer surface of the DSC shall be less than 2,200 dpm/100 cm^2 from beta and gamma emitting sources, and less than 220 dpm/100 cm^2 from alpha emitting sources.

   The contamination limits specified above are based on the allowed removable external radioactive contamination specified in 49 CFR 173.443 (as referenced in 10 CFR 71.87(i)) the system provides significant additional protection for the DSC surface than the transportation configuration). The AHSM will protect the DSC from direct exposure to the elements and will therefore limit potential releases of removable contamination. The probability of any removable contamination being entrapped in the AHSM air flow path released outside the AHSM is considered extremely small.

d. TC surface dose rates with 24PT4-DSC payload as specified below shall be confirmed prior to 24PT4-DSC closure to assure proper loading and consistency with the offsite dose analysis.

   a. ≤ 260 mrem/hr (gamma) at 3 feet from the centerline of the top of the welder neutron shield prior to wet welding operations, with the shield plug in place and approximately 4" of water drained and the welder with its neutron shield in place.

   b. ≤ 95 mrem/hr (gamma) at 3 feet from the surface of the TC neutron shield at the centerline (mid-height) of the TC prior to wet welding operations

5.2.5 <u>AHSM Thermal Monitoring Program</u>

This program provides guidance for temperature measurements that are used to monitor the thermal performance of each AHSM. The intent of the program is to prevent conditions that could lead to exceeding the concrete and fuel clad temperature criteria.

a) AHSM Concrete Temperature

The temperature measurement will be a direct measurement of the AHSM concrete temperature, or 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. A temperature measurement of the thermal performance for each AHSM will be taken on a daily basis for the 24PT1-DSC with a 40 hour blocked vent time limit and twice a day for the 24PT4-DSC with a 25 hour blocked vent time limit.

If the temperature of the AHSM at the monitored location rises by more than 80°F for the 24PT1-DSC and 30°F for the 24PT4-DSC, based on this surveillance, then it is possible that some type of an inlet and or outlet vent blockage has occurred. Visual inspection of the vents will be initiated and appropriate corrective actions will be taken to avoid exceeding the concrete and cladding temperature limits. The 80°F/30°F values are obtained from a review of a transient thermal analysis of the AHSM with a 24 kW heat load to ensure that the rapid heatu initiate corrective action prior to exceeding concrete or DSC basket material temperature limits for the resp payloads.

In addition, if the temperature of the AHSM at the monitored location is greater than 225°F, then it is possible that some type of an inlet and or outlet vent blockage has occurred. Visual inspection of the vents will be initiated and appropriate corrective actions need to be taken to avoid exceeding the concrete and cladding temperature limits. The 225°F temperature limits are chosen based on the expected concrete temperature for the 24 kW blocked vent scenarios to ensure that the associated fuel clad temperature is not exceeded.

The AHSM Thermal Monitoring Program provides a positive means to identify conditions that could approach the temperature criteria for proper AHSM operation and allow for the correction of off-normal thermal conditions that could lead to exceeding the concrete and fuel clad temperature criteria.

b) AHSM Air Temperature Difference

Following initial DSC transfer to the AHSM, the air temperature difference between ambient temperature and the roof vent temperature will be measured 24 hours (plus or minus 8 hours) after DSC insertion into the AHSM and again 5 to 7 days after insertion into the AHSM and prior to removing the AHSM door to perform the DSC retainer adjustment. If the air temperature differential is greater than 100°F, the air inlets and exits should be checked for blockage. If after removing any blockage found, the temperature differential is still greater than 100ºF, corrective actions and analysis of existing conditions will be performed in accordance with the site corrective action program to confirm that conditions adversely affecting the concrete or fuel cladding do not exist.

The specified air temperature rise ensures the fuel clad and concrete temperatures are maintained at or below acceptable long-term storage limits. If the temperature rise is within the ≤100ºF, then the AHSM and DSC are performing as designed and no further temperature measurements are required.

c) AHSM Air Vents

Since the AHSMs are located outdoors, there is a possibility that the AHSM air inlet and outlet openings could become blocked by debris. Although the ISFSI security fence and AHSM bird screens reduce the probability of AHSM air vent blockage, the ISFSI FSAR postulates and analyzes the effects of air vent blockage.

The AHSM design and accident analyses demonstrate the ability of the ISFSI to function safely if obstructions in the air inlets or outlets impair airflow through the AHSM for extended periods. This specification ensures that blockage will not exist for periods longer than assumed in the analyses.

Site personnel will conduct a daily visual inspection of the air vents to ensure that AHSM air vents are not blocked for more than 40 hours (with 24PT1-DSC). For the 24PT4-DSC credit will be taken for the temperature measurement taken in Section 5.2.5.a. Visual inspection of the AHSM air vents with the 24PT4-DSC will be performed only if the temperature monitoring system data is unavailable or if the temperature limits specified in Section 5.2.5.a are exceeded to ensure that AHSM air vents are not blocked for more than 25 hours.

5.3 <u>Lifting Controls</u>

5.3.1 <u>Cask Lifting Heights</u>

The lifting height of a loaded TC/DSC, is limited as a function of location and temperature as follows:

a) The maximum lift height of the TC/DSC inside the Fuel Handling Building shall be 80 inches if the ambient temperature is below 0°F but higher than -80°F.

b) No lift height restriction other than 10CFR50 administrative controls, is imposed on the TC/DSC during LOADING OPERATIONS provided that a single-failure-proof crane is used and if the ambient temperature is higher than 0°F.

c) The maximum lift height and handling height for all TRANSFER OPERATIONS shall be 80 inches if the ambient temperature is greater than 0°F.

These restrictions ensure that any DSC drop as a function of location or low temperature is within the bounds of the accident analysis. If the ambient temperature is outside of the specification limits, LOADING and TRANSFER OPERATIONS will be terminated.

5.3.2 Cask Drop

Inspection Requirement

The DSC will be inspected for damage after any TRANSFER CASK drop of fifteen inches or greater.

Background

TC/DSC handling and loading activities are controlled under the 10CFR 50 license until a loaded TC/DSC is placed on the transporter, at which time fuel handling activities are controlled under the 10CFR 72 license. Although the probability of dropping a loaded TC/DSC while en route from the Fuel Handling Building to the ISFSI is small, the potential exists to drop the cask 15 inches or more.

Safety Analysis

The analysis of bounding drop scenarios shows that the TRANSFER CASK will maintain the structural integrity of the DSC confinement boundary from an analyzed drop height of 80 inches. The 80-inch drop height envelopes the maximum vertical height of the TRANSFER CASK when secured to the transfer trailer while en route to the ISFSI.

Although analyses performed for cask drop accidents at various orientations indicate much greater resistance to damage, requiring the inspection of the DSC after a drop of 15 inches or greater ensures that:

1. The DSC will continue to provide confinement

2. The TRANSFER CASK can continue to perform its design function regarding DSC transfer and shielding.