TABLE OF CONTENTS

2.0 Approved Contents

2.1 Fuel Specifications and Loading Conditions (cont'd)

2.1.3 Regionalized Fuel Loading

Users may choose to store fuel using regionalized loading in lieu of uniform loading to allow higher heat emitting fuel assemblies to be stored than would otherwise be able to be stored using uniform loading. ~~Regionalized loading is limited to INTACT FUEL ASSEMBLIES or UNDAMAGED FUEL ASSEMBLIES~~ with ZR cladding. Figures 2.1-1 through 2.1-4 define the regions for the MPC-24, MPC-24E, MPC-24EF, MPC-32, MPC-32F, MPC-68, MPC-68FF, and MPC-68M models, respectively[1]. Fuel assembly decay heat limits for regionalized loading are specified in Section 2.4.2. Fuel assemblies used in regionalized loading shall meet all other applicable limits specified in Tables 2.1-1 through 2.1-3.

2.2 Violations

If any Fuel Specifications or Loading Conditions of 2.1 are violated, the following actions shall be completed:

2.2.1 The affected fuel assemblies shall be placed in a safe condition.

2.2.2 Within 24 hours, notify the NRC Operations Center.

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

2.3 Not Used

[1] These figures are only intended to distinguish the fuel loading regions. Other details of the basket design are illustrative and may not reflect the actual basket design details. The design drawings should be consulted for basket design details.

Table 2.1-1 (page 25 of 30)
Fuel Assembly Limits

VI. MPC MODEL: MPC-68M

A. Allowable Contents

1. Uranium oxide BWR UNDAMAGED FUEL ASSEMBLIES listed in Table 2.1-3, with or without channels and meeting the following specifications:

a. Cladding Type:	ZR
b. Maximum PLANAR-AVERAGE INITIAL ENRICHMENT:	As specified in Table 2.1-3 for the applicable fuel assembly array/class.
c. Initial Maximum Rod Enrichment	As specified in Table 2.1-3 for the applicable fuel assembly array/class.
d. Post-irradiation Cooling Time and Average Burnup Per Assembly	
i. Array/Class 8x8F	Cooling time ≥ 10 years and an average burnup ≤ 27,500 MWD/MTU.
ii. All Other Array/Classes	Cooling time ≥ ~~3~~ 2 years and an average burnup ≤ 65,000 MWD/MTU.

2.4.2 Regionalized Fuel Loading Decay Heat Limits for ZR-Clad Fuel ~~(Intact or Undamaged Fuel only)~~

The maximum allowable decay heat per fuel storage location for intact fuel assemblies in regionalized loading is determined using the following equations:

$Q(X) = 2 \times Q_0 / (1 + X^y)$

$y = 0.23 / X^{0.1}$

$q_2 = Q(X) / (n_1 \times X + n_2)$

$q_1 = q_2 \times X$

Where:

Q_0 = Maximum uniform storage MPC decay heat (34 kW)

X = Inner region to outer region assembly decay heat ratio
$(0.5 \leq X \leq 3)$

n_1 = Number of storage locations in inner region from Table 2.4-2.

n_2 = Number of storage locations in outer region from Table 2.4-2.

Allowable heat loads for Damaged Fuel and Fuel Debris in regionalized loading are shown in Table 2.4-3.

An optional regionalized loading pattern for MPC-68M is shown in Figure 2.4-1.

Table 2.4-2

Fuel Storage Regions per MPC

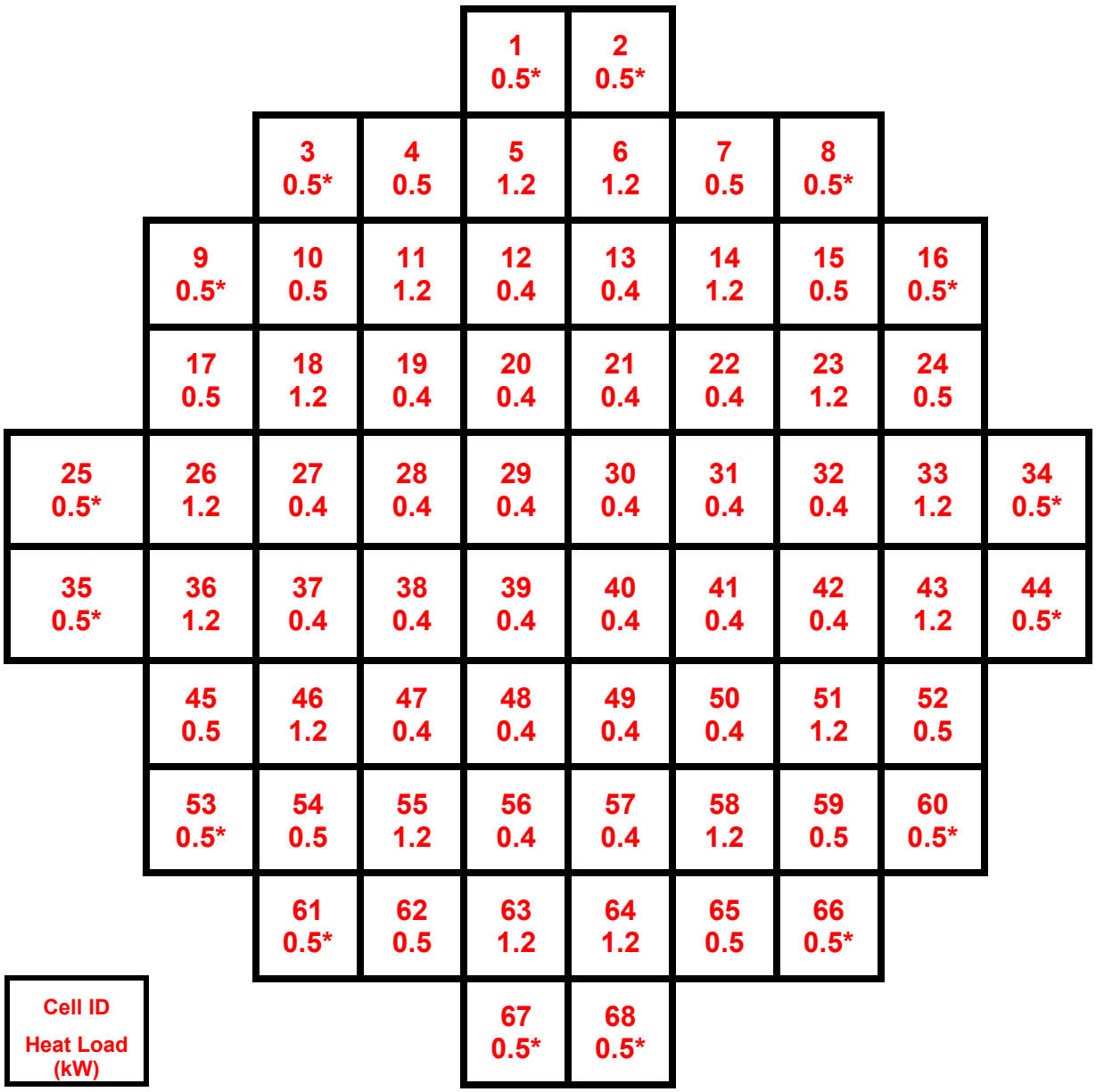
MPC Model	Number of Storage Locations in Inner Region (Region 1)	Number of Storage Locations in Outer Region (Region 2)
MPC-24 and MPC-24E/EF	12	12
MPC- 32/32F	12	20
MPC-68/68FF/68M[Note 1]	32	36

Note 1: For an optional regionalized loading pattern for MPC-68M, see Figure 2.4.1

Table 2.4-3

Allowable Heat Load for Damaged Fuel Assemblies and Fuel Debris under Regionalized Loading

MPC Model	Maximum Per Cell Allowable Heat Load for Damaged Fuel Assemblies and Fuel Debris [Note 1]
MPC-24E/24EF	$0.75*q_2$
MPC- 32/32F	$0.65*q_2$
MPC-68/68FF/68M[Note 2]	$0.75*q_2$
Note 1: q_2 is the maximum permissible heat load in Region 2 for intact fuel assemblies. Note 2: An optional regionalized loading pattern for MPC-68M including Damaged Fuel and Fuel Debris is shown in Figure 2.4.2	



* When DAMAGED FUEL or FUEL DEBRIS is stored in this location (in a DFC), the allowable heat load of the cell is limited to 0.35 kW

Figure 2.4-1
Per Cell Allowable Heat Loads (kW) - MPC-68M

Table 3-1 (page 2 of 9)
LIST OF ASME CODE ALTERNATIVES FOR HI-STORM 100 CASK SYSTEM

Component	Reference ASME Code Section/Article	Code Requirement	Alternative, Justification & Compensatory Measures
MPC basket supports and lift lugs	NB-1130	NB-1132.2(d) requires that the first connecting weld of a nonpressure-retaining structural attachment to a component shall be considered part of the component unless the weld is more than 2t from the pressure-retaining portion of the component, where t is the nominal thickness of the pressure-retaining material. NB-1132.2(e) requires that the first connecting weld of a welded nonstructural attachment to a component shall conform to NB-4430 if the connecting weld is within 2t from the pressure-retaining portion of the component.	The MPC basket supports (nonpressure-retaining structural attachments)and lift lugs (nonstructural attachments (relative to the function of lifting a loaded MPC) that are used exclusively for lifting an empty MPC) are welded to the inside of the pressure-retaining MPC shell, but are not designed in accordance with Subsection NB. The basket supports and associated attachment welds are designed to satisfy the stress limits of Subsection NG and the lift lugs and associated attachment welds are designed to satisfy the stress limits of Subsection NF, as a minimum. These attachments and their welds are shown by analysis to meet the respective stress limits for their service conditions. Likewise, non-structural items, such as shield plugs, spacers, etc. if used, can be attached to pressure-retaining parts in the same manner.
MPC	NB-2000	Requires materials to be supplied by ASME-approved material supplier.	Materials will be supplied by Holtec-approved suppliers with Certified Material Test Reports (CMTRs) in accordance with NB-2000 requirements.
MPC	NB-2121	Provides permitted material specification for pressure-retaining material, which must conform to Section II, Part D, Tables 2A and 2B	Certain duplex stainless steels are not included in Section II, Part D, Tables 2A and 2B. These stainless steel alloys are evaluated in the HI-STORM 100 FSAR and meet the required design criteria for use in the HI-STORM 100 system.