

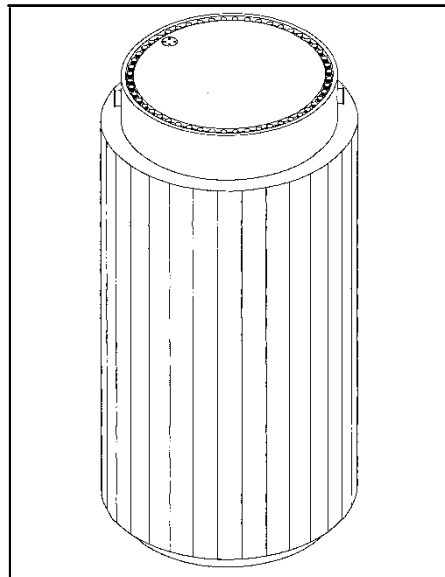
HI-STAR 100

Storage Amendment Request 72-1008-3

Pre-Submittal Presentation to NRC

September 9, 2015

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HI-STAR 100 – Storage Cask Amendment



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- Agenda
 - Background
 - Reason for Amendment
 - Amendment Scope
 - HI-STAR / HI-STORM Performance Comparison
 - Discussion on individual proposed Changes
 - Schedule

HI-STAR 100 – Storage Cask Amendment



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- Background
 - HI-STAR 100 Transportation
 - > Initial Certificate (R0) – March 1999
 - > Latest Certificate (R9) – 2010 / 2014
 - HI-STAR 100 Storage
 - > Initial Certificate (A0) – October 1999
 - > Latest Certificate (A2) – May 2001
 - > Several HI-STAR 100 systems, with MPC-68s, are in use as storage casks
 - HI-STORM 100 Storage
 - > Initial Certificate (A0) – May 2000
 - > Latest Certificate (A9) – March 2014
- Reason for Amendment
 - Re-align HI-STAR 100 storage certificate with HI-STAR 100 transport and HI-STORM 100 storage
 - Permit MPC storage in HI-STAR if need arises

HI-STAR 100 – Storage Cask Amendment



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- Amendment Scope
 - This amendment intends to only incorporate aspects that do NOT require additional analyses
 - > All technical justifications rely on previously reviewed and approved calculations and methodologies
 - Major items that are included
 - > MPC-32
 - > Metamic
 - Items that are NOT included (for now)
 - > High Burnup Fuel
 - > Burnup Credit

HI-STAR 100 and HI-STORM 100



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- HI-STAR 100
- Storage Amendments 0, 1, and 2
 - MPC-24, 68, 68F
 - Heat loads / Burnups:
 - > MPC-24 – 19 kW / 42,100 MWD/MTU
 - > MPC-68 – 18.5 kW / 37,600 MWD/MTU
- Transport – Part 71 CoC – Revision 9
 - MPC-24, 24E, 24EF, 32, 68, 68F, HB
 - Heat Loads / Burnups:
 - > MPC-24 – 20 kW / 44,500 MWD/MTU
 - > MPC-68 – 18.5 kW / 44,500 MWD/MTU
 - > MPC-32 – 20 kW / 44,500 MWD/MTU
- HI-STORM 100
- Storage Amendments 0 through 9
 - MPC-24, 24E, 24EF, -32, -32F, -68, -68F, -68M
 - Heat Loads / Burnups
 - > MPC-24 – 36.9 kW / 68,200 MWD/MTU
 - > MPC-32 – 36.9 kW / 68,200 MWD/MTU
 - > MPC-68 – 36.9 kW / 65,000 MWD/MTU

Change #1

1) Addition of MPC-32 for PWR Fuel

- Allows storage of existing MPCs from HI-STORM 100 system
- Aligns with transport, except no burnup credit taken
- Reviewed existing design basis calculations
 - > Existing storage calculations bound MPC-32, or
 - > Transportation design basis analyses utilized
- MPC-32 approved for transport in HI-STAR 100, Rev 5
- Approved for storage in HI-STORM 100, Amendment 1

Changes #2 and #3



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2) Metamic Neutron Absorber

- Metamic neutron absorber used in MPC-32, -24, and -68
- Aligns with updated approvals of newer material
- Metamic first approved for transport in HI-STAR 100, Revision 8

3) MPCs Leak-Tight

- MPCs ruled to be leak-tight in accordance with ISG-18
- MPCs stored in HI-STAR 100 are identical to those stored in HI-STORM 100
- Leak-tight criteria approved in HI-STORM 100, Amendment 2

Changes #4 and #5

4) Soluble Boron Credit

- Soluble boron credit for MPC-32 and MPC-24
- Same credit taken for the MPC-32 and MPC-24 in HI-STORM 100
- Soluble boron credit first approved for MPCs in HI-STORM 100, Revision 1

5) Pocket Trunnions optional

- Pocket trunnions made optional under HI-STAR 100 transportation Rev 2
- Pocket trunnions not needed for storage

Change #6 and #7

6) Forced Helium Dehydration (FHD)

- Added FHD as drying option
- Aligns with updated approvals
- FHD first approved for storage in HI-STAR 100, Amendment 2

7) Horizontal Storage of HI-STAR

- Allows flexibility in storage
- Utilizes transportation analyses as bounding, same heat load and helium backfill as allowed in transportation

Changes #8 and #9



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8) Drawing Updates

- Most recent drawings approved under transportation included
- Updated drawings include some alternative material for forged materials
- Approved under HI-STAR 100 Revision 9

9) Fuel Cladding Temperature Limits

- Updated in accordance with ISG-11 Rev 3
- Aligns with most recent staff guidance

Changes #10 and #11



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10) Single Failure Proof Handling Devices

- Updated in accordance with HI-STORM FW
- Same criteria approved for storage in HI-STORM FW, Amendment 0

11) Quality Assurance

- Most recent quality assurance program description added
- Aligns with current QA program

HI-STAR 100 – Storage Cask Amendment #3

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- Other items of note
 - NUREG-1536 Rev 0 format maintained for convenience / ease of review, technical basis from Rev 1 followed.
 - MPC Design Pressure (accident condition) updated to match transportation limit
- Schedule
 - Submittal planned for September 2015

HI-STAR 100 – Storage Cask Amendment #3



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Thank you!