AREVA

E-47009
January 6, 2017

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Subject: Submittal of Biennial Report of 10 CFR 72.48 Evaluations Performed for the NUHOMS® HD System, CoC 1030, for the Period 01/08/15 to 01/06/17, Docket 72-1030

Pursuant to the requirements of 10 CFR 72.48(d)(2), AREVA Inc. hereby submits the subject 10 CFR 72.48 summary report. Enclosure 1 provides a brief description of changes, tests, and experiments, including a summary of the 10 CFR 72.48 evaluation of each change implemented from 01/08/15 to 01/06/17, including indication as to whether the evaluations had associated Updated Final Safety Analysis Report (UFSAR) changes that will be incorporated into the UFSAR for the NUHOMS® HD system in the next update.

Should you or your staff have any questions regarding this submittal, please contact Mr. Dennis Williford by telephone at (704) 805-2223, or by e-mail at Dennis.Williford@areva.com.

Sincerely,

Jayant Bondre

Jayant Bondre
Vice President and Chief Technical Officer

cc: Christian Jacobs (NRC SFM), provided in a separate mailing

Enclosure:

1. Report of 10 CFR 72.48 Evaluations Performed for the NUHOMS® HD System For the Period 01/08/15 to 01/06/17

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REPORT OF 72.48 EVALUATIONS PERFORMED FOR THE NUHOMS® HD SYSTEM FOR THE PERIOD 01/08/15 to 01/06/17

Enclosure 1 Part 1 - DESIGN CHANGES

***LR 721030-406 Rev. 0** – (will be incorporated into next UFSAR revision)*

Change Description

This LR adds the 32PTH Type 2 DSC and OS187H Type 2 TC to the CoC 1030, NUHOMS® HD UFSAR via a new Appendix B. The 32PTH Type 2 DSC is identical to the 32PTH Type 1 DSC described in UFSAR Appendix A but with longer shell and basket lengths. The CoC 1030 Technical Specifications describe allowable fuel assembly types for storage, which remain unchanged. Since the 32PTH Type 2 cavity is longer than the length of the allowed fuel assembly, longer DSC fuel spacers will restrain the axial movement of the fuel assemblies.

The OS187H Type 2 TC is identical to the OS187H Type 1 TC except for a slightly longer inner cavity length. The increased cavity length is achieved by reducing the air flow wedge thickness from 1 inch to 0.50 inch. Since the 32PTH Type 2 DSC is longer, the transfer cask spacer is not required. Note that although these TCs are designed with air flow wedges, under CoC 1030 the TC is pressurized with helium during TRANSFER OPERATIONS and the air flow feature is not used.

The HSM-H has also been modified to include longer rails with an optional bolted spacer to support both the 32PTH Type 1 and the longer 32PTH Type 2 DSC. The HSM-H door used for loading the 32PTH Type 2 DSC has a reduced thickness to accommodate the longer 32PTH Type 2 DSC.

Evaluation

All changes to the OS187H Type 2 Transfer Cask screened out and therefore no evaluations of this SSC are required.

NUHOMS® 32PTH Type 2 DSC

The design function of the 32PTH Type 2 DSC is to provide structural support, thermal cooling, radiological shielding, criticality control, and confinement safety functions for the stored spent fuel assemblies.

Structural Evaluation

The structural design function is not adversely impacted as a result of the reduced top and bottom thickness of the Main Assembly. The evaluation performed for transfer and storage loading conditions and for accident drop scenarios shows that the stresses are below the ASME code allowable values. The DSC shell assembly components and closure shell weld stresses remain structurally adequate.

Thermal Evaluation

REPORT OF 72.48 EVALUATIONS PERFORMED FOR THE NUHOMS® HD SYSTEM FOR THE PERIOD 01/08/15 to 01/06/17

The thermal design function of the 32PTH Type 2 DSC is not adversely affected as a result of the proposed design change. The overall increase in length of the DSC provides a larger heat transfer surface for the DSC outer shell and increases the heat rejection capability.

Shielding Evaluation

The reduced thickness of the top shield plug (2 inches thinner) and bottom lid (2.25 inches thinner) adversely impacts the shielding function. The total calculated system operational dose during pool to pad operations increases from 2.2 Rem to 3.6 Rem (assuming no draining of the neutron shield based on ALARA requirements). The maximum calculated dose rates during transfer and storage operations for the 32PTH Type 2 DSC are bounded by those previously calculated in the UFSAR. Further, there are no changes to the calculated dose rates for postulated accidents.

Criticality Evaluation

The DSC Main Assembly does not perform a criticality design function, so there is no impact on the criticality design function for the 32PTH Type 2 DSC.

Confinement Evaluation

The confinement design function is not adversely affected as a result of the proposed design change. Confinement is achieved for the spent fuel by the shell and cover plates which are welded to the shell assembly.

NUHOMS® HSM-H

The design function of the HSM-H is to provide physical protection, radiological shielding, and decay heat removal for the stored spent fuel assemblies. The HSM-H door provides missile protection and shielding for the DSC.

Physical Protection Evaluation

The tornado generated missile impact evaluation of the HSM-H was performed for a spectrum of missiles. There are no changes in the spectrum of postulated missiles. The evaluation of the optional door has been conservatively analyzed for the missile impact load without taking structural credit for the concrete and considering only the outside square/circular steel plate. Therefore, reducing the thickness of the concrete section of the door will not affect the validity of the evaluation performed.

There are no changes to the dynamic pressure loads caused by explosion (blast load). The type of above ground surface explosion (blast) considered causes only a change in the air pressure surrounding the modules, so it can be concluded that the HSM-H is qualified for the 32PTH Type 2 DSC against blast loads. The HSM-H structural analyses related to physical protection remain valid and no further evaluations are required for this design change.

Shielding Evaluation

The HSM-H door accomplishes shielding design functions by use of material type and thickness for effective attenuation of radiation. Both shield doors for the HSM-H consist of a steel plate fastened to the front concrete wall, and have a stepped reinforced concrete block at the rear of the steel plate. The reinforced concrete block for both shield doors consists of a block at the front which is 6-7/8 inches thick. However, the door rear block for the 32PTH Type 2 is 1 foot 6-1/2 inches thick, 4 inches thinner than the design basis 32PTH DSC.

The storage system dose rates for the 32PTH Type 2 DSC in the HSM-H with the Optional Door are generally comparable to those reported in the UFSAR within the statistical uncertainty of the evaluation method. There is no change to the maximum and average dose rates reported in the UFSAR and employed as the basis for the Technical Specification limits and site dose calculations. However, the local dose rate at the door center line is increased (due to a reduction in the concrete thickness of the HSM-H door and the steel thickness in the DSC shield plug).

The results of the shielding calculations indicate that the dose rates calculated in the immediate vicinity of the HSM-H are in the same order of magnitude of the 32PTH or the 32PTH Type 1. For the 32PTH Type 2 DSC, a localized increase of a factor of 1.78 is expected at the door centerline (HSM-H door centerline dose rate increases from 0.8 mrem/hr to 1.42 mrem/hr), although there is no change to the average dose rate on the front surface of the HSM-H. The average front surface dose rate is significantly dominated by the front vent dose rate and the average dose rates at the various HSM-H surfaces (front, side and roof) are bounded by the design basis average surface dose rates reported in the UFSAR (remains approximately 320 mrem/hr for the 32PTH Type 2 DSC and 752 mrem/hr for the design basis dose rate). This localized dose rate increase will, therefore, not have any impact on the site dose rate since this is calculated using the average surface dose rates.

Thermal Evaluation

The thermal design function of the HSM-H is not adversely affected as a result of the proposed use of the reduced thickness optional (Type B) door when loading a 32PTH Type 2 DSC. The overall increase in length of the 32PTH Type 2 DSC provides a larger heat transfer surface for the DSC outer shell and increases the heat rejection capability. The HSM-H design is based on a bounding heat load of 40.8 kW which is higher than the 32PTH Type 2 maximum heat load of 34.8 kW. Therefore, the thermal function of the HSM-H is unchanged.

The 32PTH Type 2 DSC and HSM-H are designed using the same design criteria as the original 32PTH DSC and HSM-H, and are functionally identical to the DSC and HSM-H previously evaluated in the UFSAR.

The evaluation of the safety functions resulting from this design change demonstrate that the eight 72.48 evaluation criteria were met.