72-1004

TRANSNUCLEAR

July 27, 2004
NUH03-04-67

Ms. Mary Jane Ross Lee
Spent Fuel Project Office
U. S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Subject: Report of 72.48 Evaluations Performed for the Standardized NUHOMS® System for the Period 11/01/03 to 6/30/04.

References: 1. FSAR for the Standardized NUHOMS® Horizontal Modular Storage System For Irradiated Nuclear Fuel, Revision 8.

Dear Ms. Ross Lee:

Pursuant to the requirements of 10 CFR 72.48(d)(2), Transnuclear, Inc., (TN) herewith submits the subject 72.48 summary report. This report provides a brief description of changes, tests and experiments, including a summary of the 72.48 evaluation of each change implemented from 11/01/03 to 6/30/04.

Enclosure 2 provides a listing of each of the 72.48 changes implemented in Reference 1. Enclosure 3 provides a listing of changes implemented in Reference 1 as a result of incorporation of NRC approved amendments.

Please contact me at 510-744-6053 if you require any additional information in support of this submittal.

Sincerely,

UBChopra

U. B. Chopra
Licensing Manager

Docket 72-1004

Enclosures:

1. Report of 72.48 Evaluations Performed for the Period 11/01/03 to 6/30/04.
2. Listing of 72.48 Changes Implemented in the Standardized NUHOMS® FSAR Revision 8.
3. Listing of Approved Amendment Changes Implemented in the Standardized NUHOMS® FSAR Revision 8.

CC: Mr. L. Raynard Wharton

NMSS01

REPORT OF 72.48 EVALUATIONS PERFORMED FOR THE PERIOD 11/01/03 TO 06/30/04

(REFERENCE: STANDARDIZED NUHOMS® FSAR, NUH-003, REVISION 8)

Prepared by: UB Chopra Date: 7/27/04
U. B. Chopra

Reviewed by: Jayant Bondre Date: 7/27/04
J. Bondre

Approved by: UB Chopra Date: 7/27/04
U. B. Chopra

REPORT OF 72.48 EVALUATIONS PERFORMED FOR THE STANDARDIZED NUHOMS® SYSTEM FOR THE PERIOD 11/01/03 TO 6/15/04 (REFERENCE NUHOMS® FSAR REVISION 8)

DESIGN CHANGES

SE 721004-029

Change Description:

This 72.48 evaluation addresses the following 2 changes to the 32PT DSC Main Assembly procurement drawings:

1. Allow for the siphon & vent block to be positioned below the top of the support ring. As a result, the top shield plug will rest only on the support ring. The bearing stresses on the support ring are increased due to the reduction of bearing area available to support the top shield plug.

2. Add notches to the support ring to facilitate loading/unloading of the fuel assemblies into/from the outermost fuel compartments of the DSC basket. Clarify nomenclature for stamping serial numbers on 32PT DSCs

Evaluation of Change 1:

The impact of the revised elevation of the support ring relative to the siphon and vent block results in an increase of 8.3% in the support ring stresses. The worst case stress ratio is 0.70 for the upper weld of the support ring which is acceptable.

The fitup of the top end components and the support ring is verified during performance testing. The slight elevation change has no adverse impact on the DSC. Once the DSC is sealed, the support ring no longer interfaces with other components.

The support ring is not explicitly modeled in the thermal, shielding or criticality analysis as it is located outside the active fuel region. Hence this change does not adversely impact the thermal, shielding or criticality analysis.

Evaluation of Change 2:

The notch in the support ring reduces the amount of bearing surface for the top shield plug. Considering that there are eight (8) locations that could be notched, the notching represents approximately 21% of the support ring length.

The worst case stress ratio after considering a reduction in bearing surface due to the siphon and vent block elevation change (Change 1 described above) is 0.70. Therefore, a 21% increase would result in a revised stress ratio of 0.70 x 1.21 = 0.85 which is acceptable.

The notch in the support ring has no adverse impact on the shielding analysis. The amount of material removed from the support ring is small and located at the edge of the DSC, away from the greatest source term. As discussed in evaluation of change 1above, changes to support ring do not adversely affect thermal or criticality analysis.

The specification of the nomenclature for stamping serial numbers is an editorial change.

SE 721004-037

Change Description:

REPORT OF 72.48 EVALUATIONS PERFORMED FOR THE STANDARDIZED NUHOMS® SYSTEM FOR THE PERIOD 11/01/03 TO 6/15/04 (REFERENCE NUHOMS® FSAR REVISION 8)

This 72.48 evaluation addresses the following 2 changes to the 32PT DSC Shell Assembly procurement drawings:

1. Add an alternate option for the 32PT DSC bottom end closure. This option replaces the inner and outer bottom cover plates plus the bottom shield plug with a single solid forging welded to the DSC shell. This alternate configuration of the DSC bottom closure is ASME NB compliant and subject to full volumetric examination.
2. Add details for a basket shear key to prevent basket rotation.

Evaluation of Change 1:

The use of a one-piece bottom end forging that combines the inner bottom cover plate (IBCP), bottom shield plug (BSP), and outer bottom cover plate (OBCP) into one thick end plate (up to 8.75 inches thick) results in some redistribution of the primary stresses. The stresses (mainly bending) due to pressure loads are reduced as the end plate thickness is increased. Hoop stresses and bending stresses in the cylindrical shell are reduced as a result of the additional stiffening provided by the thicker end plate. The bending stresses in the cylindrical shell are also expected to decrease, since the rotations at the end plate perimeter (based on a circular plate model with pinned edges) are reduced due to the thicker plate.

The thermal stresses in the shell are increased due to a thicker bottom forging. The increased thermal stresses in the shell are included in the revised load combination calculation and are shown to be within the ASME Code limits.

The bottom end forging is outside the active fuel region, where most of the heat rejection occurs radially. The thermal resistance of the alternate bottom end closure is similar to the base configuration. Although the fraction of the total heat rejection along the DSC axial direction is very small, the one-piece forging eliminates the gaps between the IBCP-to-BSP and BSP-to-OBCP and thus provides improved axial heat transfer. Hence, this is a betterment change relative to DSC thermal performance.

The bottom end forging is outside the active fuel region and has no adverse effect on the shielding and criticality control capabilities of the DSC. The total thickness of the bottom end is unchanged. The external geometry (e.g., diameter, lead-in chamfers) of the bottom end is unchanged and does not result in any adverse mechanical interface issues

Evaluation of Change 2:

The structural evaluation determines the stresses in the shear key, the attachment weld, and the shell. All these stresses remain within ASME Code allowables.

The new basket key covers less than 0.03% of the total transition rail surface. In addition, the basket key is located at the bottom of the DSC, away from the active fuel region. The DSC model used in the thermal analysis does not contain this level of detail. The basket shear key will have no adverse impact on the thermal analysis.

The optional basket shear key has no adverse impact on criticality and shielding, as the key is outside the active fuel region, both radially, and axially. The optional basket key material (stainless steel) compensates for the material lost in the R90 transition rail (aluminum).

The optional basket shear key keeps the basket from rotating with respect to the shell, ensuring the integrity of the siphon tube. The shear key has no potential interference with any loading/unloading equipment.

REPORT OF 72.48 EVALUATIONS PERFORMED FOR THE STANDARDIZED NUHOMS® SYSTEM FOR THE PERIOD 11/01/03 TO 6/15/04 (REFERENCE NUHOMS® FSAR REVISION 8)

SE 721004-038

Change Description:

This 72.48 evaluation addresses the following changes to the 32PT DSC Basket Assembly procurement drawings:

1. Add two alternative basket configurations, designated as Alternate 1 (Type A Basket only) and Alternate 2 (Type A/B/C/D Basket), to the 32PT DSC design. Alternate 1 basket consists of 16 neutron absorbing plates (NAP) and 16 aluminum compartment plates, with all the L-shaped chevron plates being oriented such that one of its legs is at the bottom and the other vertical within each basket cell, when the DSC is in a storage configuration (horizontal). Included in this change is the reduced minimum emissivity requirement of 0.8 for the NAP and compartment plates. Alternate 2 basket is similar to the Alternate 1 basket with regards to plate orientation and emissivity specification but has 24 NAPs and 8 aluminum plates instead.
2. Add an alternate basket configuration which deletes the retention plates at the bottom of the basket. This alternate option requires the NAP and aluminum compartment plates to be extended to the bottom of the basket grid.
3. Add four lifting cutouts in the bottom end of the basket plates. These lifting cutouts are used to place the empty DSC basket into the canister during fabrication.
4. Add an alternative for the R90 transition rail, which utilizes a 3-piece, radially split, configuration. This change is only applicable to the 2 Alternative basket configurations listed in Change 1 above.
5. Add acceptance criteria for scratches and local thinning on the NAP and compartment plates. This is done as a contingency to address potential fabrication non-conformances. This change is only applicable to the 2 Alternative basket configurations listed in Change 1 above.
6. Allow use of lifting lugs to restrain the basket against rotation. This utilizes shimming plates attached to the transition rails.
7. Revise the Non-Destructive Examination (NDE) requirements for the R45 and R90 transition rail attachment stud weldments and allow an alternative attachment stud configuration with different NDE requirement.

Evaluation of Change 1:

Structural:

The NAP and compartment plates are not relied upon to perform structural functions, other than self-weight support. The total mass of the NAP and compartment plates for the 2 alternate basket configurations is unchanged relative to the base configuration described in the FSAR, as is the method of attachment (number and size of screws). Therefore, there is no adverse impact on the structural analysis of the basket cell plates.

Thermal:

A new thermal evaluation, using the same methodology as described in the FSAR, was performed for the 2 alternate basket configurations. This evaluation demonstrates that the fuel cladding temperatures as documented in FSAR Appendix M remain bounding.

The basket component temperatures are also bounded by the temperatures documented in FSAR Appendix M. Since the temperatures are lower and there are no changes to the volume inside the DSC, the DSC internal pressures for these two basket alternatives are bounded by the DSC internal pressures documented in FSAR Appendix M.

Shielding:

The total mass of NAP plus the aluminum compartment plates is not changed from the base configuration. Therefore, the two alternative basket configurations, which differ only in the relative number of NAP and compartment plates, have no adverse impact on the shielding analysis.

Criticality:

The two alternative basket configurations are evaluated using the same methodology as described in the FSAR for all the fuel assembly types listed in the Technical Specifications Table, Table 1-1g. The calculated keff values for the alternate baskets configurations are lower than the original basket described in the FSAR.

Mechanical:

The NAP and compartment plates in the two alternative basket configurations occupy the same amount of space as in the base configuration. The thickness of the NAP and compartment plates is unchanged. Therefore, there are no issues with loading and unloading of the fuel assemblies.

Evaluation of Change 2:

As stated above, the NAP and aluminum compartment plates are relied upon to support self weight only. In the horizontal orientation of the DSC, the deletion of the bottom steel retention plates has no impact on the structural analysis of the plates. In the vertical orientation, without the bottom retention plates, the NAP plates are supported by the inner bottom cover plate of the DSC for vertical (downward) loading. Since the analyzed axial stresses in the NAP and aluminum compartment plates are based on a 175-inch nominal length (which is greater than the 172.1 inches maximum length of the plates), the existing structural analysis is still bounding.

This change essentially results in replacing the bottom steel retention plates with the incremental volume of poison/aluminum plates and thus is a betterment change relative to the shielding and thermal analysis as described in the FSAR.

The extension of the NAP plates, although outside the active fuel region, provides additional criticality control. The allowable shifting of the NAP is unchanged.

There is no change in the interfaces during loading/unloading operations.

Evaluation of Change 3:

The 4 lifting cutouts result in a small reduction (approximately 3.6%) in cross-section at the bottom of the basket.

This change is deemed acceptable since end drop basket cell plate stresses are not controlling (side drop stresses control but the cutouts at the bottom end of the basket do not have an adverse impact under this loading, because the fuel loading is less).

The lifting cutouts, which represent a very small fraction of the basket cross sectional area, are located at the bottom of the basket in an area outside the active fuel region. Hence, the change has no adverse impact on thermal or shielding analysis.

For Alternate 1 (16 NAP/16 aluminum compartment plates) basket configuration, the lifting cutouts do not remove any of the poison material, as the cutouts are located in fuel cell walls that do not contain any poison. In addition, the cutouts are located at the bottom end of the fuel assembly, at the end of the active fuel region. For Alternate 2, a criticality analysis was performed using the same methodology as described in the FSAR and postulating removal of a 3.9" length of poison (both legs of the chevron) from four corner cells. The results of the evaluation demonstrate that the difference in keff between the alternate configurations (with/without the cutouts) is statistically insignificant.

The cutouts do not intrude into the fuel cell openings and thus have no adverse impact on loading/unloading operations.

Evaluation of Change 4:

A structural evaluation was performed for the option of a 3-piece radial configuration of the R90 transition rail. This evaluation demonstrates that the basket stresses are within ASME Code allowables, and that the structure remains stable under all postulated loadings (including side drops).

A thermal evaluation, using the same methodology as described in the FSAR but with an emmisivity value of 0.8 for the NAP and aluminum compartment plates, addresses the 3-piece aluminum transition rails for the 2 Alternate DSC basket configurations. The analysis conservatively considers a uniform gap between the transition rail sections for the alternative configuration. The analysis demonstrates that the existing thermal analyses of the basket given in the FSAR remain bounding.

Any dose rate effects from the gaps between the adjacent rail sections would be very localized and would be insignificant on the outside of the transfer cask or HSM. The presence of the gaps does not result in an adverse impact on the criticality analysis, since any gaps will be filled with borated water, as opposed to aluminum, thus reducing reactivity.

Evaluation of Change 5:

The specification of acceptance criteria for scratches and/or local thinning for the NAP and aluminum compartment plates does not result in any significant metal removal, and thus there is no adverse structural impact. The NAP and aluminum compartment plates are not relied upon structurally, except for self support and bearing between the fuel assemblies and the basket cell plates.

As described in Change 4 above, a thermal evaluation was performed for the 2 Alternate basket configurations. This analysis demonstrates that even if 10% of the plate area becomes uncoated due to scratches, the thermal analysis results provided in the FSAR are bounding. The allowed reduction in plate thickness is localized and relatively small (controlled primarily by criticality); thus the ability of the NAP and aluminum compartment plates to reject heat is not adversely impacted.

The NAP and compartment plates are not relied upon in the shielding analysis. Scratches in the anodized surfaces have no adverse impact on criticality, as the anodized surfaces are not credited in the criticality analyses.

The acceptance criteria for local thinning for the NAPs conservatively requires that the thinning is limited to less than 0.5% of the plate area and the thinnest section is at least 90% of the specified minimum.

The criticality analyses were performed for the Alternate 1 basket/DSC (16 NAP/16 compartment plate) configuration using a neutron absorbing plate that is 5% narrower than the design value (8.00" versus 8.435"). This analysis may be extended to the 24 NAP/8 compartment plate configuration. A factor of 10 reduction in this parameter (5% to 0.5%) was then conservatively used in the criteria. The conclusion of this analysis is that criticality results are not adversely impacted.

The 90% thickness limitation over the 0.5% area is conservatively bounded by the analysis that demonstrated that criticality is maintained even if 5% of the total area were completely removed.

The fuel gauge free path test during fabrication ensures that the neutron absorbing plates fit properly within the basket and the intended fuel will be accommodated by the fuel compartments. Therefore, there are no issues with loading and unloading of the fuel assemblies.

Evaluation of Change 6:

The use of the lifting lugs to prevent basket rotation involves the use of additional shim plates, inserted between the lugs and the existing cutout in the R45 transition rail. This change is evaluated in a structural analysis and shown to be acceptable. Note that the lifting lugs are only used to lift an unloaded or empty canister (without fuel).

The lifting lugs are not credited in the thermal analysis, since they are located at the DSC periphery and top of the DSC (away from the active fuel region). The addition of shim plates provide additional heat transfer capacity and additional shielding and thus are a betterment change. It has no adverse criticality impact as the lifting lugs are located away from the active fuel region; both axially and radially. The fuel compartment opening is not impacted. Therefore, there is no adverse impact on loading/unloading operations.

Evaluation of Change 7:

Structural:

The R45 and R 90 transition rails are provided with attachment studs. A structural analysis evaluated the change from a progressive PT examination to a visual examination (VT) for these stud weldments and determined that the R90 stud weldments don't need to be qualified, since the R45 alone carry load during a side drop event. Thus the change is acceptable for the R90 rail stud weldments.

The stud weldments for the R45 rail end sections meet the design requirements, even if they are only subject to visual NDE. However, the center section of the R45 rails which are 83.5" long with 3 pairs of studs shall be PT examined to satisfy the analysis assumptions of a quality factor of 0.55. The structural analysis also evaluates an alternate option for 4 pairs of attachment studs for the center section of a R45 rail and determines that it is acceptable to substitute VT for PT examined for this alternate configuration and still meet the design requirements.

The transition rail attachment studs are not relied upon for thermal analysis modeling. The change in NDE requirements or the addition of a 4^{th} row of studs for the R45 rails has no thermal impact.

The revision to the NDE requirements has no adverse impact on the shielding or criticality analysis, as no change in material volume or type is involved. Similarly, the alternative to add a pair of attachment studs for the R45 rail has no adverse impact on these analyses as the added studs replace aluminum.

REPORT OF 72.48 EVALUATIONS PERFORMED FOR THE STANDARDIZED NUHOMS® SYSTEM FOR THE PERIOD 11/01/03 TO 6/15/04 (REFERENCE NUHOMS® FSAR REVISION 8)

SE 721004-044

Change Description:

The 24PHBL DSC procurement documentation is revised to reflect the addition of an alternate design configuration for the top and bottom DSC shield plugs (designated herein as "shifted shielding" option). This "shifted shielding" shield plug design configuration is added as an alternate option to the "ribbed shield plug" design of the 24PHBL DSC design described in the FSAR.

This alternate option differs from the original "ribbed shield plug" design configuration in the following aspects:

1. A portion of the lead shielding is shifted from the Bottom Shield Plug to the Top Shield Plug.
2. The Bottom Lead Shielding is encased within the Outer Bottom Cover Plate and the Inner Grapple Ring Support (at the bottom) and the Bottom Forging (at the top and at the sides).
3. The Top Lead Shielding is encased within the Inner Top Forging (at the bottom and side) and the Lead Plug Top Cover Plate (at the top).
4. No stiffeners (i.e. ribs) are used in the Top and Bottom Lead Shielding for this added option.
5. The Grapple Ring Support (in one piece) is welded to the Bottom Forging, which forms part of the pressure boundary. The Bottom Forging is designed to take the pressure, ram push, and grapple pull loads.
6. An Inner Grapple Ring is welded to the Grapple Ring Support, and is designed to take a ram push load of up to 80 kips.
7. The 24PHBL DSC cavity length has been increased by ¼". Correspondingly, the length of the support rods for the basket assembly has also been increased by ¼".

In addition, this change allows electroless nickel coating in lieu of aluminum thermal spray for the 24PHBL DSC spacer discs.

Evaluation:

Thermal Evaluation

The thermal model for the 24PHB DSC described in Chapter N.4 of the FSAR, does not include the end plugs and assumes that 100% of the heat load is dissipated radially. This is a conservative assumption. The HSM and Transfer Cask thermal analysis presented in the Chapter N.4 of the FSAR for the 24PHB DSC bounds the 24PHBL DSC with shifted shielding option because the longer cavity length would result in lower heat flux, which, in turn, would result in lower temperatures.

The maximum DSC internal pressures calculated in Section N.4 of the FSAR are based on the bounding DSC with standard cavity length, i.e., 24PHBS DSC. Therefore, these pressures would also bound the 24PHBL DSC with shifted shielding option.

Therefore, all the temperatures and DSC internal pressure for the 24PHBL DSC with "shifted shielding" shield plug option are bounded by the analysis presented in the FSAR. No new analysis is required.

Structural Evaluation

A revised structural analysis of the 24PHBL DSC shell assembly with shifted shielding configuration is performed using the same methodology as described in FSAR Chapter N.3. The results of this analysis demonstrate that the 24PHBL DSC Shell Assembly is structurally acceptable for normal, off-normal, and accident conditions and the maximum stress ratio calculated for the DSC shell assembly components for the various load combination remains less than 1.0.

The results of the revised structural analysis for the 24PHBL DSC basket assembly shows that the support rods are structurally acceptable for normal, off-normal, and accident load conditions. The governing stress ratios for the support rods do not change as a result of the ¼" increase in length of the support rods.

The effect of the increase in DSC shell length of 0.125" and the increase in cavity length of 0.25" are considered to have negligible effect on the DSC shell stress evaluations as they represent about 0.06% and 0.1% length change, respectively. From a thermal expansion/interferences standpoint, the 0.25" increase in cavity length is a betterment change because it provides added room for thermal expansion.

Confinement Barriers and Systems Evaluation

The pressure / primary confinement boundary for the 24PHBL DSC is provided by the inner top forging, the siphon and vent block, the DSC shell, and the bottom forging.

At the top, the inner top forging, the siphon and vent block, and the DSC shell are welded to each other using partial penetration welds, which are subject to surface PT. The top pressure boundary also contains two penetrations (vent and siphon ports) for draining, vacuum drying and backfilling the DSC cavity. These ports are closed with welded cover plates. These port cover welds are also subject to surface PT. Similar to the "Ribbed Shielding" option, these top DSC pressure boundary welds are not fully ASME code compliant. ASME Code Exceptions have been applied to these above-mentioned top pressure boundary welds.

At the bottom, the bottom forging is welded to the DSC shell using full penetration weld (i.e., NB-4240 compliant), which is subjected to full volumetric RT examination with surface PT (i.e., NB-5230 compliant). In addition, the DSC shell, the bottom forging, and the associated weld are subjected to pressure testing. This satisfies the NB-6111 requirement, which states that all completed pressure retaining systems shall be pressure tested. Therefore, all the components defining the bottom pressure boundary are fully ASME NB Code compliant. This is a betterment change relative to the "ribbed shielding option" where the bottom pressure boundary is not fully ASME code compliant.

In addition, the confinement barrier material for the "Shifted Shielding" option is the same as the -24PHB DSCs i.e. stainless steel, which assures that no operable corrosion mechanism will result in a failure of the DSC to provide confinement.

Nuclear Criticality Safety Evaluation

The criticality analysis for the 24PHB DSC is performed using only the active fuel length and the upper plenum regions explicitly modeled. The presence of fuel assembly components above and below these regions is modeled as borated water. These same models are also applicable to the 24PHBL DSC with shifted shielding option and therefore, these analysis results are also applicable to the optional shifted shielding 24PHBL DSC. No new analysis is required.

Shielding Evaluation

As a result of shifting a portion of the lead shielding (i.e. ½" thick) from the bottom to the top, conservatively neglecting the benefit of the increased lead shielding at the top, the total occupational exposure is 3,085 mrem/canister load. This value is bounded by the FSAR reported value of 3.1 rem/canister load in FSAR Section N.10.1.

Since the change in the occupational exposure (at generally "short distance") is minimal, the expected change in the dose rate exposure to an average on-site worker or off-site individual will also be small and insignificant. In conclusion, this "shifted shielding" option does not significantly alter the near term and long term dose rate exposures of the on-site workers and off-site individuals.

Operations/Maintenance Evaluation

The loading/unloading procedures for the "Shifted Shielding" option of 24PHBL DSC are essentially the same to those provided in Chapter N.8 of the FSAR for the 24PHB DSCs. For the 24PHBL DSC with shifted shielding option, the inner top cover plate is now integral with the top shield plug. Therefore, only the portion of the loading/unloading procedures which included separate inner top cover plate and shield plug placement in the DSC is revised in Chapter N.8. The safety function, criteria, or maintenance procedures for the inner top cover plate or shield plug are the same as described in Chapter N.8 of the FSAR.

All the materials used for the added shifted shielding option have been evaluated for hydrogen generation during fuel loading, as required by IEB 96-04. These evaluations are documented in the FSAR. There is no change to the hydrogen monitoring requirement as discussed in the FSAR for this "Shifted Shielding" option of the 24PHBL DSC.

The NUHOMS® Cask remains a passive system and all acceptance criteria and maintenance requirements are identical to those of the standard DSC described in the body of the FSAR.

Mechanical Evaluation

The addition of the "Shifted Shielding" option has no adverse impact on the mechanical design of the standardized NUHOMS® -24PHB system. The external interfaces with the Transfer Cask, transfer equipment and HSM are unchanged.

SRS 721004-075

Change Description:

The 32PT DSC shielding analysis is revised to correct an error. This error affects only the bounding Burnup/Initial Enrichment/Cooling time combination(s) for the 0.6 kW heat load per assembly case.

The analysis originally determined that Heat Load Zoning Configuration (HLZC) No. 2 is the configuration that produces the highest dose rates on the surfaces of both the HSM and TC. Correction of the error does not result in the change in the bounding configuration. Further, while the absolute value of the ANISN results changed by a factor of 2 for the 0.6 kW cases, the relative results do not change; therefore, the Burnup/Initial Enrichment/Cooling time combination which results in the highest contribution to the dose rates on and around the HSM and TC remains unchanged.

Evaluation:

The analysis revision updates the "dose rates" calculated using ANISN and reported in FSAR Table M.5-36, Table M.5-37, and Section M.5.2.4. While correcting the error in the analysis did revise the ANISN "dose rates" used to determine the design basis combination, it did not alter the conclusion that the selected Burnup/Initial Enrichment/Cooling Time combination remains the bounding combination for determining the design basis source terms.

Since the design basis combination remains unchanged, the design basis source terms remain unchanged. Hence, the design basis shielding evaluation for the dose rates on and around the HSM and TC for all normal, off normal and accident conditions (including occupational and site dose evaluations) as described in the FSAR remain unchanged.

This change does not adversely affect the system design as described in the FSAR, or the method of performing or controlling a design function or the methods of evaluation as described in the FSAR and thus was screened out. However, since it did result in changes to the FSAR, it is reported here for completeness.

SE 721004-076

Change Description:

The structural evaluation of the OS197 Transfer Cask (TC) is revised to allow an increase in the maximum (dry) payload and wet payloads to 97,250 lbs and 102,410 lbs respectively. This makes this analysis consistent with the TC trunnion lifting capacity of 208,500 lbs.

The maximum (dry) payload is based on the OS197 TC trunnion lift capacity of 208,500 lbs less the cask weight of 111,250 lbs (TC neutron shield full, with top lid), or 97,250 lbs.

Similarly, the maximum (wet) payload is calculated as 208,500 lbs less 106,090 lbs (TC neutron shield full, without top lid), or 102,410 lbs. These payload limits assume that the TC neutron shield is full (4,580 lbs).

The maximum allowed loaded TC weight as described in the FSAR remains unchanged i.e 208,500 lb.

As a consequence of this change, any references to 100 ton (32PT-S100 and 32PT-L100 DSC) or 125 ton (32PT-S125 and 32PT-L125 DSC) capacity crane have been deleted from Appendix M. The 32PT DSC 100-ton configuration is now designated as 32PT-S100/32PT-L100, and the 32PT DSC 125-ton configuration is designated as 32PT-S125/32PT-L125 in Appendix M. This is a nomenclature change only.

Evaluation

The OS197 TC design criteria are defined in the FSAR and there is no change in the criteria. There is no change in the design basis decay heat load of 24 kW for the TC. There is no change to the TC design. Therefore, no new thermal analysis is required.

A revised structural evaluation of the TC, using the same methodology as described in the FSAR, demonstrates that the TC components meet the stress criteria for normal, off-normal, and accident load conditions for the increased allowed payload. Based on the calculated stress ratios, the governing minimum inner liner wall thickness for a Service Level D load combination is 0.368", which is less than the minimum fabrication thickness of 0.38" and therefore, is acceptable.

The maximum stress ratios are 0.46, 0.77 and 0.85 for Service Levels A/B, C, and D, respectively. Therefore, the OS197 TC is acceptable for handling an increased dry payload of 97,250 lb, and an increased wet payload of 102,410 lb.

The confinement barriers and systems remain unchanged and unaffected by this change. No new analysis is required.

This change does not involve any configuration change to the DSC or the OS197 TC. The shielding and criticality functions of the system are unaffected by this change.

Since this change does not involve any configuration change to the DSC or the OS197 TC, the external interfaces and thus loading/unloading procedures for the DSC remain unchanged and unaffected.

SRS 721004-088

Change Description:

The analysis which determines the minimum cavity length of 61BT DSC (when storing damaged fuel) is revised to accommodate a generic end cap design.

Evaluation:

This 72.48 screening addresses a generic end cap design in determining the DSC cavity length. The specified minimum cavity length remains unchanged, however, Note 15 of Drawing NUH-61B-1060-SAR is revised to provide clarification.

This change does not adversely affect the system design as described in the FSAR, or the method of performing or controlling a design function or the methods of evaluation as described in the FSAR and thus was screened out. However, since it did result in a change to the 61BT DSC FSAR drawing, it is reported here for completeness.

SE 721004-090

Change Description:

The 61BT DSC procurement drawing is revised to chamfer the bottom of the holddown ring. The 3/8" plate is chamfered 1/16 inch on each side to facilitate placement of the holddown ring into the DSC.

Evaluation:

The compressive stresses in the holddown ring are increased due to the chamfers, since the available cross-sectional area is reduced. The normal condition stresses are increased from 0.15 ksi to 0.23 ksi, which is still below the ASME Section III NF 19.4 ksi bearing stress allowable. For accident conditions, Appendix F applies, and the maximum stress increases from 7.5 ksi to 11.25 ksi.

The addition of chamfers to the DSC holddown ring does not have an adverse impact on the thermal, shielding and criticality response of the DSC, since the holddown ring is beyond the active fuel region. The holddown ring is not part of the 61BT DSC confinement boundary.

The holddown ring is used to prevent shifting of the basket during horizontal transfer operations. The chamfers are desirable to facilitate the placement of the holddown ring into the DSC. There are no other interface requirements.

The analysis changes have no adverse impact on the response of the DSC to other postulated events and no new failure modes are created for these events. No changes to the DSC system function or operation are involved.

REPORT OF 72.48 EVALUATIONS PERFORMED FOR THE STANDARDIZED NUHOMS® SYSTEM FOR THE PERIOD 11/01/03 TO 6/15/04 (REFERENCE NUHOMS® FSAR REVISION 8)

SRS 721004-095

Change Description:

The 61BT DSC procurement drawing is revised to allow the neutron absorber (poison) plate to be divided in 2 halves in the radial direction to allow fabrication flexibility. Also, the minimum width of the basket insert plate is revised to allow its use as a backer support plate for the damaged fuel extension.

Evaluation:

This 72.48 screening addresses a change which provides fabrication flexibility to allow the use of radially split 2 halves of poison plates. The specified dimensions of the poison plate remain unchanged. In addition, the basket insert plate width is modified to accommodate this change.

This change does not adversely affect the system design as described in the FSAR, or the method of performing or controlling a design function or the methods of evaluation as described in the FSAR and thus was screened out. However, since it did result in a change to the 61BT DSC FSAR drawing, it is reported here for completeness.

SRS 721004-098

Change Description:

The 61BT DSC procurement drawing is revised to allow the DSC grapple ring and grapple support ring to be made from a single forged piece and to add a second drain hole at zero azimuth. Also, allow tapping the bottom of the top shield plug to support the top short fuel spacer. Finally, provisions are made to tap the perimeter to allow handling the top shield plug and fill unused taps with stainless steel plugs.

Evaluation:

This 72.48 screening addresses changes which provide fabrication flexibility. These changes do not adversely affect the system design as described in the FSAR, or the method of performing or controlling a design function or the methods of evaluation as described in the FSAR and thus was screened out. However, since it did result in a change to the 61BT DSC FSAR drawing, it is reported here for completeness.

SRS 721004-100

Change Description:

In the Parts List on procurement drawing 1098-30-106 Revision 1, Item 23 is revised from a ½" plate to 3/8" plate. Item 23 is a stiffener plate for the wall attachment angle assembly of the HSM Model 80. FSAR drawing NUH-03-6016-SAR is also corrected as a result.

Evaluation:

This change to the plate thickness brings the procurement drawing 1098-30-106 in agreement with the supporting structural calculation which analyzes the plate as 3/8" thick. The analysis presented in the FSAR is consistent with 3/8" thickness for the stiffener plate and thus this change represents an editorial change.

This change does not adversely affect the system design as described in the FSAR, or the method of performing or controlling a design function or the methods of evaluation as described in the FSAR and thus was screened out. However, since it did result in a change to the FSAR drawing, it is reported here for completeness.

SRS 721004-102

Change Description:

Specific sections of FSAR Appendix K are revised to replace the term "inner pressure boundary" with "confinement boundary" and the term "outer pressure boundary" with either "redundant sealing" or identify specific subcomponents which provide redundant sealing.

Evaluation:

This 72.48 screening addresses a clarification change to provide clarity about the limits of ASME Code jurisdiction in response to CAR 2002-037. This change is consistent with the licensing and design basis as described in the FSAR and is a nomenclature change to the terms "inner pressure boundary" and "outer pressure boundary" as described therein.

This change does not adversely affect the system design as described in the FSAR, or the method of performing or controlling a design function or the methods of evaluation as described in the FSAR and thus was screened out. However, since it did result in a change to the FSAR, it is reported here for completeness.

SRS 721004-107

Change Description:

Revise 61BT DSC procurement drawing (damaged fuel basket configuration) to delete the "all-around" weld symbol for attachment of strap to the fuel compartment extension.

Evaluation:

The reduction in weld length is consistent with supporting analysis. This change does not adversely affect the system design as described in the FSAR, or the method of performing or controlling a design function or the methods of evaluation as described in the FSAR and thus was screened out. However, since it did result in a change to the FSAR drawing, it is reported here for completeness.

SRS 721004-115

Change Description:

The configuration of bottom end cap shown on 61BT DSC procurement drawing is revised to accommodate the attachment of short fuel spacers. In addition, a minor modification is made to the fabrication details related to the four corner pads on the bottom end cap.

Evaluation:

This change to the bottom end cap eliminates fabrication interference and is consistent with the supporting analysis. This change does not adversely affect the system design as described in the FSAR, or the method of performing or controlling a design function or the methods of evaluation as described in the FSAR and thus was screened out. However, since they it did result in a change to the FSAR drawing, it is reported here for completeness.

SRS 721004-118

Change Description:

This 72.48 screening addresses changes to FSAR Table 3.1-1, Table 3.1-1a, and Table M.6-3 of the Standardized NUHMOS® FSAR.

The change to Table M.6-3 is a typographical correction while changes to Table 3.1-1 and 3.1-1a correct inconsistencies between these FSAR tables and the COC 1004 Technical Specifications.

Evaluation:

The changes make the revised FSAR Tables 3.1-1 and 3.1-1a consistent with the COC 1004 and the associated technical specifications. The change to Table M.6-3 is a typographical correction.

The subject changes are editorial and do not adversely affect the system design as described in the FSAR, or the method of performing or controlling a design function or the methods of evaluation as described in the FSAR and thus were screened out. However, these changes did result in changes to FSAR and thus are reported here for completeness.

SE 721004-124

Change Description:

This revision to a structural analysis evaluates the change in ASME service level criteria from Level A to Level B for uplifting and uprighting an empty 32PT DSC. These are non-operational load cases as shown in FSAR Table M.2-15.

Evaluation:

The basis for this change is that the lugs are used only at the time of upending and lifting the empty 32PT DSC into the transfer cask, prior to putting the DSC in service (i.e prior to fuel loading), and removing the empty DSC out of the transfer cask after fuel unloading. This makes this loading condition(s) a rare event (not a frequent event associated with Level A service level criteria), and, therefore, a Level B designation for this loading condition(s) is more appropriate.

A review of the DSC lifting lugs structural analysis shows that the change in the Service Limits from A to B for the vertical lift of an empty DSC has no effect on the function of the lifting lugs. The service level B allowables are identical to service level A allowables for the components (shell, support ring, and lug). For the weld, the level B allowables are increased by 1.33. The evaluation, performed using the same methodology as described in the FSAR, shows that both the welds and components meet the Level B criteria.

The change to the Service Limits from A to B for the vertical lift of an empty DSC has no adverse affect on the thermal, confinement, criticality or shielding analysis of the 32PT-DSC system or the associated loading/unloading procedures as described in the FSAR.

SRS 721004-126

Change Description:

This 72.48 screening addresses a change that deletes specific requirement from the FSAR that the chloride content of lubricants and cleaning consumables be limited to 1ppm. The chloride content of these consumables utilized during DSC fabrication and/or loading operations is not an important to safety consideration, but a limit that is typically plant specific. This level of fabrication detail is not necessary in the FSAR.

Evaluation:

The change is to delete the specific chloride content limit of 1ppm specified in the FSAR (Appendices K and M). Procurement documents specify the contaminant limits during DSC fabrication and typically each plant controls the chemistry limits on consumables during loading and, therefore, these tend to vary from plant to plant. In lieu of specifying a specific limit, the FSAR text is changed to require that the material(s) selected for cleaning the DSC be compatible with DSC materials and pool chemistry requirements. Thus the change is not an adverse change to system design as described in the FSAR.

The subject change does not adversely affect the method of performing or controlling a design function or the methods of evaluation as described in the FSAR and thus was screened out. However, it results in changes to the FSAR and thus is reported here for completeness.

SRS 721004-139

Change Description:

This 72.48 screening addresses the following clarification type changes made to the FSAR:

Changes 1: In Section M.8.1.6, Step 19 change "drop-in retainer" to "axial retainer" to be consistent with the nomenclature in Section 5.1.1.6, Step 8, and HSM drawing NUH-03-6017-01-SAR.

Change 2: In Sections M.8.3 to M.8.8 clarify the "No Change" statement by cross referencing the applicable Sections of the FSAR.

Change 3: In Section M.10.1, First Para. Add the words "Heat Load Zoning" before "Configuration 2 from Chapter M.2" to be consistent with the nomenclature in Chapter M.2.

Evaluation:

All these changes are of editorial/clarification nature. None of these changes adversely affect the system design as described in the FSAR, or the method of performing or controlling a design function or the methods of evaluation as described in the FSAR and thus were screened out. However, these changes did result in changes to the FSAR text and thus are reported here for completeness.

REPORT OF 72.48 EVALUATIONS PERFORMED FOR THE STANDARDIZED NUHOMS® SYSTEM FOR THE PERIOD 11/01/03 TO 6/15/04 (REFERENCE NUHOMS® FSAR REVISION 8)

SRS 721004-146

Change Description:

This 72.48 screening addresses clarifications and corrections which are of an editorial nature to the FSAR: These changes eliminate minor inconsistencies, consolidate cross-references provided in the FSAR to Appendix K, M, and N for 61BT, 32PT and 24PHB DSCs respectively. In addition, an introduction is added in Chapter1 to describe how the newly added FSAR Appendices relate to several recently approved Amendments. Table 3.1-2 is corrected to be consistent with the Technical Specification Table 1-1b.

Evaluation:

All of the changes listed above are of editorial/clarification nature. None of these changes adversely affect the system design as described in the FSAR, or the method of performing or controlling a design function or the methods of evaluation as described in the FSAR and thus were screened out. However, these changes did result in the changes to the FSAR text and thus are reported here for completeness.

REPORT OF 72.48 EVALUATIONS PERFORMED FOR THE STANDARDIZED NUHOMS® SYSTEM FOR THE PERIOD 11/01/03 TO 6/15/04 (REFERENCE NUHOMS® FSAR REVISION 8)

NON CONFORMANCES (NCRS) AND CORRECTIVE ACTION REPORTS (CARS)

SE 721004-063 (SNCR 03-tgi-75, 76, and 77 and NMR N-0401, 0412, 0483)

Change Description:

This 72.48 evaluation addresses two types of Non Conformances associated with the fabrication of 32PT DSC basket assembly as follows:

(a) The neutron absorber sheets developed cracks during the bending/forming process (KSL SNR 03-tgi-75, -76 and -79), and

(b) Localized thinning of the neutron absorber sheets due to the removal of surface defects (Eagle Picher NMR N-0401, N-0412 and N-0483).

Evaluation:

Structural:

The cracks that developed during the bending process run along the longitudinal axis of the poison plates at the bend region. There is no adverse effect on the longitudinal stress calculations, since there is no reduction in the cross-sectional area of the plate due to cracks.

For localized thinning, the poison plate cross sectional area is reduced resulting in higher stresses. Based on a conservative review of the thinned areas of the poison plates, it represents a 5.1% reduction in cross- sectional area. The originally calculated stresses were based on a poison plate length of 175 inches. However, the actual length of the poison plates is approximately 164.1 inches (or about 6.2% shorter than the analyzed length). Since the axial stress is proportional to the length of the plate, the shorter length offsets the stress increase due to thinning (6.2% reduction due to shorter length versus a 5.4% increase due to thinning). Therefore, the stresses reported in the FSAR Sections M.3.6.1.3.2 (F) and M.3.7.5.3 remain bounding.

Thermal:

Cracks:

The thermal model used in Appendix M.4 includes the corners of the neutron poison plates. The effect of the cracks under consideration is to introduce a small discontinuity in the heat conduction path around the corner. Because they are oriented axially, the cracks have no effect on axial heat transfer.

The worst-case plate has a total crack length of 134 mm or 3.2% of the total plate length. Conservatively assuming that the bent corners result in complete through wall cracks, there is a 3.2% reduction in heat flow area. The tested thermal conductivity of the poison material shows a minimum of 8.3% increase in thermal conductivity when compared to that used in analysis. For the small crack lengths and the relatively small portion of overall heat flux going across the bent corners, it is clear that an 8.3% increase in thermal conductivity compensates for a 3.2% decrease in area.

Localized Thinning:

The worst case thin spot corresponds to a minimum plate thickness of 1.444 mm. Thinning of the poison plate from 1.778 mm to 1.444 mm, assuming that it affects 0.5% of total plate surface, results in a 0.1% average poison plate thickness decrease and has a negligible impact on the thermal analysis results.

Comparing the results of the evaluations for cracks with those for localized thinning, there is more than enough margin in the minimum tested thermal conductivity values to offset the effects of cracks and localized thinning. Therefore, there is no adverse impact on the thermal results.

Shielding:

The cracks and localized thinning for the poison plates do not result in an adverse impact on shielding as the plates are not relied upon in the shielding analysis as discussed in FSAR M.5.3.1.

Criticality:

Cracks:

Since some of the plates with cracks also show some lifting of an outer layer of delaminated material at the crack, a potential for loss of this neutron poison material was evaluated.

A revised criticality analysis, using the same methodology as described in the FSAR, was performed to evaluate the effect of reducing the plate width to 8.00 inches from 8.435 inches. Such a change simulates that the entire bend area of the poison plate is eliminated and replaced by borated water. The maximum value of $k_{eff} + 2\sigma$ for this configuration is still below the maximum value reported in the FSAR.

Localized Thinning:

An alternate minimum thickness was determined based on the neutronic inspection requirements of FSAR Section M.9.1.7.1.4.3. Plates whose thinnest location are equal to or exceed this value are accepted; those thinner are rejected. This evaluation showed that the subject absorber plates meet the minimum 7.0 mg $B10/cm^2$ required at the area of local depression.

Mechanical:

The fuel gauge free path test during fabrication ensures that the neutron absorbing plates with cracks and thinning fit properly within the basket and the intended fuel will be accommodated by the fuel compartments. Therefore, there are no issues with loading and unloading of the fuel assemblies.

SE 721004-078 (CAR F-04-011)

Change Description:

The fourteen PWR Model 102 HSMs installed at the Point Beach ISFSI are arranged on a basemat in a double row (back-to-back) array. A small portion of the front of each row (approximately 18") projects past the edge on the basemat and over the approach slabs. The Point Beach ISFSI contains two such basemats and this evaluation covers the initial double row array configuration and is considered applicable to the planned expansion of a double row array on each basemat.

Evaluation:

Only the structural evaluation of the HSM concrete components is affected by the overhang. There is no change to the DSC Support Structure or its support configuration within the module. Other than the foundation support of the HSM array, all other physical configuration of the HSM array remains unchanged. Thermal and shielding performance of the HSM and HSM array is unchanged and criticality is not altered since the change is outside the DSC.

This structural assessment uses traditional static and concrete design methods to confirm that component stresses and module stability are within the allowable limits. For the purpose of this evaluation, the maximum overhang of the module is conservatively assumed to be two feet (2').

The loads from the overhang portion are self weight of a 24" thick portion of the front wall thickness, weight of the shielded door assembly, weight of the 24" long section of the HSM roof, live load acting on this 24" section of the HSM roof and vertical seismic acceleration. The loads are conservatively considered to act on the floor element of the base unit only. That is, only the section properties of the 12" thick floor across the width of the module are used to demonstrate acceptable stress conditions due to the overhang.

The most limiting load combination (including all accidents) that conservatively produces the governing stress condition for the floor, is used in the structural evaluation to demonstrate that the computed bending moment and shear force are acceptable. The evaluation also shows that the module will not tip during loading process because stabilizing moment is much greater than the tipping moment. Finally, potential of long term differential settlement, where the basemat may settle more than the approach slabs, is also assessed, and found to be acceptable.

SE 721004-121 (TN NCR F-04-014 Revision 1)

Change Description:

This 72.48 evaluation addresses the "use-as-is" disposition of NCR F-04.014. Following DSC transfer operations, an inspection of the OS197-H transfer cask (TC) found scratches in the TC inner liner. The client performed a UT of the inner liner and determined that there was approximately an area of 1.75 in^2 that did not meet the minimum inner liner thickness requirement of 0.45 inches specified on TC procurement drawing. This gouge is located at approximately 120°. The base metal thickness of the inner liner was measured at 0.482" and the thickness in the area of the gouge was determined to be 0.412". This is less than the minimum inner liner thickness requirement of 0.45" by 0.038".

Per FSAR drawing NUH-03-8002-SAR, Note 3, the minimum inner liner thickness is 0.44". The NCR disposition for the TC results in a less than the minimum analyzed thickness requirement by 0.028".

Evaluation:

Structural:

This nonconformance of the inner liner of the OS197-H onsite transfer cask has negligible effect on the safety function of the cask since the area of the gouge represents a very small proportion of the liner circumference. ASME Section NC-3217(c) permits the allowable membrane stress to be increased 10% for areas up to $(Rt)^{1/2}$ or a circle of 4" diameter for the 1/2" thick cask inner liner. At this location of the cask, all the stress in the liner can be considered membrane, or secondary in nature. Therefore, the reduction in thickness of 0.028/0.44 represents an increase in stress of 6% and is thus acceptable.

The area in question is very localized, at the same level as the top shield plug and outside the active fuel zone. Hence this non-conformance has no adverse affect on the thermal, criticality, or shielding performance of the TC as described in the FSAR.

This deviation has no impact on DSC/transfer cask/HSM operations since there is no direct interface between the cask inner liner area in question and other system components.

SE 721004-127 (TN NCR F-04.023)

Change Description:

This 72.48 evaluation addresses NCR F-04.023 related to the 24PHBL DSC Bottom Shield Plug Assembly (BSPA), Serial Numbers No. 1 & 2:

The procurement drawing shows the location of the siphon tube counter bore (sump) at approximately 125 degrees and also details the location of the support rod posts in the Bottom Shield Plug Forging. During the inspection of the Bottom Shield Plug Forging following welding of the support rod posts into the forging and lead pour, it was determined that the support rod posts were welded in incorrect locations on the forging. This resulted in the siphon tube counter bore in the incorrect location in the forging.

The nonconformance is dispositioned as "Rework" to machine the sump at the correct location, and "Repair" to "fill-in" the incorrectly located sump.

Evaluation:

The weld fill out of the incorrectly located sump was performed using TN approved ASME material, processes, and procedures. The depth of the counterbore (1/4") is such that NB requires a volumetric (RT) examination of the repair. However, RT is not possible due to the presence of lead, so a best-effort PT of every layer was performed. Therefore, to maintain code compliance, the added weld metal is treated as a nonstructural attachment to pressure retaining material. In the determination of NDE requirements, the weld fill is conservatively considered a structural attachment, which per NB-5260 of the Code, requires a PT. For further conservatism, the weld repair was PT examined after every layer.

The existing structural evaluation and acceptance of the normal sump is adequate to address the "missing" pressure retaining material in the errant sump. This is a local effect, given the 2" diameter of the sump and the 67" diameter of the DSC. Structurally, the removal of material for the sump is a local effect, located in an area of lower stress (outer edge) and the distance between the two sumps is more than 10 diameters. The higher ASME Code allowables for these local stresses (50%) is more than sufficient to address the reduced thickness. The ¼ recess results in only a 15% reduction in thickness.

With the weld fill-in (non-structural attachment) of the sump, the configuration of the bottom forging (one sump at the correct location) was restored, and there is no impact on shielding, thermal, and criticality disciplines. The external interfaces with the Transfer Cask, transfer equipment and HSM are unchanged.

The confinement capability of the empty DSC shell and the bottom forging is ensured by radiographic inspection of the longitudinal and circumferential weld. The mislocated sump is machined no deeper than design and the correctly located sump has the final machined surface PT examined, per the rules of NB.

In addition, the weld filler material, which is ASME Code material, specified by the design specification for compatibility with the BSPA, assures that no operable corrosion mechanism will result in a failure of the DSC to provide confinement.

Listing of 72.48 Changes Implemented in the Standardized NUHOMS® FSAR Revision 8

FSAR Section Number	Description of Change	Evaluation Category	Applicable SRS/SE
Appendix M.1.2.1, M.1.2.2.3.1, M.2.1, M.3.1.1, M.3.4.4.2, M.3.4.4.3, M.3.6.1.3.1, M.3.7.5.3, M.3.7.5.3.1.1, M.3.7.5.3.3, M.3.7.5.3.3.1, M.3.7.12, M.4.4.1.1, M.5.1, M.5.2, M.6, M.6.1, M.6.2, M.6.3.1, M.6.4, M.6.4.1.3, M.6.4.2, M.6.4.3, M.6.4.4, M.6.4.5, M.6.6.4, M.6.6.5, and M.6.6.6. Tables M.2-3, M.3.6-2, M.3.6-5 thru M.3.6-7, M.3.7-1, M.3.7-2, M.3.7-4, M.3.7-6 thru M.3.7-11, M.6-1, M.6-13 thru M.6-20 and M.6-25 thru M.6-40. Figures M.2-4 thru 6, M.3.6-3, M.3.6-4, M.3.6-10 thru M.3.6-13, M.3.7-3, M.3.7-5, M.3.7-10 thru M.3.7-12, M.4-22 & 23, M.6-1 thru M.6-4, and M.6.-13 thru M.6-18.	Add two alternative basket configurations, designated as Alternate 1 (Type A Basket only) and Alternate 2 (Type A/B/C/D Basket), to the 32PT DSC design. Included in this change is the reduced minimum emissivity requirement of 0.8 for the NAP and compartment plates. Add an alternative for the R90 transition rail, which utilizes a 3-piece, radially split, configuration for the 2 alternate basket configurations listed above. Implement miscellaneous fabricability enhancement changes to the 32PT DSC configuration such as the addition of 4 lifting cut-outs at the basket bottom, deletion of the basket retention plates, allow the use of lifting lugs to restrain basket rotation, specify acceptance criteria for local thinning and scratches of the NAP and compartment plates, etc. Revise the FSAR to reflect the supporting analyses for the above changes.	32PT DSC Design Change	SE 721004-038
Appendix N.1, N.1.2.1, N.1.5, N.3.1.1, N.3.1.2.1, N.3.2, N.3.3, N.3.6.1.2, N.3.6.1.3.3, N.3.7.3.1, N.3.7.5.2, N.3.7.5.3, N.3.7.10.1, N3.8, N.4.1, N.5, N.6, N.7.1.1, N.7.1.3, N.8.1.3, N.8.1.4, N.10, N.11, N.11.2.1.3. Tables N.3.2-1, N.3.6-1, N.3.7-1 thru N.3.7-7, N.5-3, N.5- 4, N.10-1, N.10- 2, N.11-1 and N.11- 2. Figures N.3.1-1a thru c, N.3.6-2 and N.3.6- 3.	Addition of an alternate design configuration for the 24PHBL DSC top and bottom shield plugs (designated as "Shifted Shielding"). The configuration of the top and bottom shield plugs is revised to eliminate the use of stiffeners and allow use of forging in-lieu of cover plates. The grapple ring and grapple support design is modified to interface with the revised bottom closure. In addition, the 24PHBL DSC cavity length (and the length of the basket assembly support rods) is increased by ¼". Finally, electroless nickel coating is allowed in lieu of aluminum thermal spray for the spacer discs. Revise the FSAR to reflect the supporting analysis for this alternate option.	24PHBL DSC Design Change.	SE 721004-044

Listing of 72.48 Changes Implemented in the Standardized NUHOMS® FSAR Revision 8

FSAR Section Number	Description of Change	Evaluation Category	Applicable SRS/SE
Appendix M.5.2.4. Tables M.5-36 and M.5- 37.	Revise the 32PT DSC dose rates calculated using ANISN and as reported in FSAR Tables M.5-36 and M.5-37 for the 0.6 kW case. Also, revise the corresponding analysis results in Section M.5.2.4.	Correction of an error in the 32PT DSC shielding analysis	SE 721004-075
3.1.2.1, 8.1.1.9, 8.2.5.2, Appendix C.3.7, Appendix M.3.4.3, M.3.6.1.9, M.3.7.5.4, and M.3.7.10.3. Tables 3.2-1, 8.1-20a, 8.2-9a, 8.2-21a, 8.2-22a, 8.2-23a, M.1-1, M.2-19, and M.3.2-1. Appendix M.1.2.1, M.2.1, M.5, M.5.1, M.5.4, M.5.4.8, M.5.4..9, M.5.4.10, M.5.4.11, M.5.4.12, M.5.4.13, M.5.4.14, M.10.1, M.10:2, M.11.2.1.3, M.11.2.5.3. Tables M.5-3 thru M.5-5, M.5-23, M.5-24, M.10-1, and M.10-2. Figure M.5-4 thru M.-9, M.5-11 thru M.5-13, M.5-15 thru M.5-30.	(a) Revise the structural evaluation of OS197 Transfer Cask to allow an increase in the maximum dry and wet payloads to 97,500 lbs and 102,410 lbs respectively to make this analysis consistent with the TC trunnion capacity. (b) Revise designation of 32PT DSC 100 ton configuration to 32PT-S100/32PT-L100. Similarly revise designation of 32PT DSC 125 ton configuration to 32PT-S125/32PT-L125.	Minor Analysis Change Nomenclature Change	SE 721004-076
K.3.6.1.3.3, K.3.7.5.3.2.1 Table K.3.7-6.	Revise the configuration of the 61BT DSC Holddown Ring to add a 1/16" chamfer at the bottom. The structural analysis shown in Appendix K.3.6 and K.3.7 is revised accordingly.	Minor Design Change to the 61BT DSC Holddown Ring	SE 721004-090
K.3.1.2.1, K.3.7.5.1, K.7.1.1 thru K.7.1.3 Tables K.2-5, K.3.1-2, K.3.7-15 Figure K.3.1-1	Provide clarification of the 61BT DSC confinement boundary and applicability of ASME Code jurisdiction. Revise affected FSAR sections identified to replace the term "inner pressure boundary" with "confinement boundary" and the term "outer pressure boundary" with either "redundant sealing" or identify specific subcomponents which provide redundant sealing.	Clarification Change	SRS 721004-102

Listing of 72.48 Changes Implemented in the Standardized NUHOMS® FSAR Revision 8

FSAR Section Number	Description of Change	Evaluation Category	Applicable SRS/SE
Tables 3.1-1, 3.1-1a, and M.6-3.	Revise identified FSAR Tables to reflect correction of minor inconsistencies and typographical errors.	Clarification/ Correction Change	SRS 721004-118
Table M.2-15	Revise the 2 non-operational load cases for the 32PT DSC in FSAR Table M.2-15 from Level A to Level B to make them consistent with the revised structural analysis.	Minor Analysis Change	SE 721004-124
Appendices K.3.4.1 and M.3.4.1	Delete specific chloride content limits from FSAR Appendices K and M. These chemistry limits are plant specific and the FSAR is revised accordingly.	Clarification Change	SRS 721004-126
M.8.1.6, M.8.3 thru M.8.8, and M.10.1	Revise identified FSAR sections to provide clarification and consistency in content.	Clarification Change	SRS 721004-139
Various pages	Minor changes to eliminate inconsistencies and implement editorial corrections/clarifications.	Clarification and correction Change	SRS 721004-146

Listing of 72.48 Changes Implemented in the Standardized NUHOMS® FSAR Revision 8

FSAR Drawing Number	Description of Change	Evaluation Category	Applicable SRS/SE
Standard HSM Drawing: NUH-03-6016-SAR	Revise thickness of the stiffener plate (Item 23) from ½" to 3/8" on Drawing NUH-03-6016-SAR.	Minor Change	SRS 721004-100
61BT DSC Drawings: NUH-61B-1060-SAR NUH-61B-1061-SAR NUH-61B-1062-SAR NUH-61B-1063-SAR NUH-61B-1064-SAR NUH-61B-1066-SAR	Revise Note 12 of Drawing NUH-61B-1060-SAR to replace "inner pressure boundary" with "confinement boundary".	Clarification Change	SRS 721004-102
	Revise Note 15 of Drawing NUH-61B-1060-SAR to clarify the 61BT DSC cavity minimum length requirements when storing damaged fuel.	Clarification Change	SRS 721004-88
	Revise Notes 8 and 9 of Drawing NUH-61B-1061-SAR to allow the DSC grapple ring and grapple support ring to be made from a single forged piece and add a second drain hole a zero azimuth.	Fabrication Flexibility Change	SRS 721004-98
	Revise Note 12 of Drawing NUH-61B-1062-SAR to allow tapping the bottom of the top shield plug to support short fuel spacer. Also, provisions are made to tap the perimeter to allow handling the top shield plug and fill unused taps with stainless steel plugs.	Minor Design Change	SRS 721004-98
	Revise Note 2 of Drawing NUH-61B-1063-SAR and the minimum width of the basket inserts (Item 38) shown on of Drawing NUH-61B-1064-SAR to allow flexibility of using 2 radial pieces for the poison plates.	Minor Design Change	SRS 721004-95
	Revise the .configuration of the 61BT DSC Holddown Ring shown on Drawing NUH-61B-1063-SAR to add a 1/16" chamfer at the bottom.	Minor Design Change	SRS 721004-90
	Revise the configuration of bottom end cap shown on Drawing NUH-61B-1066-SAR to accommodate the attachment of short fuel spacers.	Minor Design Change	SRS 721004-115
	Revise Drawing NUH-61B-1066-SAR to delete the "all-around" weld symbol for attachment of strap (Item 20) to the fuel compartment extension (Item 19) for damaged fuel modification.	Minor Design Change	SRS 721004-107

Listing of 72.48 Changes Implemented in the Standardized NUHOMS® FSAR Revision 8

FSAR Drawing Number	Description of Change	Evaluation Category	Applicable SRS/SE
32PT DSC Drawings: NUH-32PT-1001-SAR NUH-32PT-1002-SAR NUH-32PT-1003-SAR NUH-32PT-1004-SAR NUH-32PT-1006-SAR	(a) 32PT DSC Main Assembly Changes (Drawing NUH-32PT-1001-SAR) Allow for the siphon & vent block to be positioned below the top of the support ring. Add notches to the support ring. (b) 32PT DSC Shell Assembly Changes (Drawing NUH-32PT-1002-SAR) Add an alternate option for the 32PT DSC bottom end closure. This option replaces the inner and outer bottom cover plates plus the bottom shield plug with a single solid forging welded to the DSC shell. Add details for an optional basket shear key to prevent basket rotation. Clarify nomenclature for stamping serial numbers on 32PT DSCs. (c) 32PT Basket Assembly Changes (Drawing NUH-32PT-1003-SAR & -1004-SAR) Add two alternative basket configurations, designated as Alternate 1 (Type A Basket only) and Alternate 2 (Type A/B/C/D Basket) to the 32PT DSC design. Add four cutouts in the bottom of the basket plates to facilitate lifting the basket during fabrication. Add an alternate basket configuration in which the bottom retention plate is deleted. Add specific details (dimensions and tolerances) for the drain cutouts in the bottom of the basket. Revise the NDE requirements for the R45 and R90 transition rail attachment stud weldments and allow an alternative attachment stud configuration with different NDE requirement. (d) 32PT Transition Rail Changes (Drawing NUH-32PT-1006-SAR) Add an alternative for the R90 transition rail, which utilizes a 3-piece, radially split, configuration for the 2 alternate basket configurations listed above.	32PT DSC Design Change.	SE 721004-029 SE 721004-037 SE 721004-038 SE 721004-038

Listing of 72.48 Changes Implemented in the Standardized NUHOMS® FSAR Revision 8

FSAR Drawing Number	Description of Change	Evaluation Category	Applicable SRS/SE
24PHB DSC Drawing: NUH-HBU-1000-SAR	<u>"Shifted Shielding Option" for 24PHBL DSC (Drawing NUH-HBU-1000-SAR)</u> Revise the 24PHB DSC configuration to reflect the addition of an alternate design configuration for the top and bottom shield plugs (designated as shifted shielding option). This alternate option shifts a portion of the lead shielding from the bottom shield plug to the top shield plug. The configuration of the top and bottom shield plugs is revised to eliminate the use of stiffeners and allow use of forging in-lieu of plates. The grapple ring and grapple support design is modified to interface with the revised bottom closure. In addition, the 24PHBL DSC cavity length (and the length of the basket assembly support rods) is increased by ¼". Finally, electroless nickel coating is allowed in lieu of aluminum thermal spray for the spacer discs.	24PHBL DSC Design Change	SE 721004-044

Listing of Approved Amendment Changes Implemented in the Standardized NUHOMS® FSAR Revision 8

FSAR Section or Drawing Number	Description of Change	Evaluation Category	Applicable SRS/SE
1, 1.2.1, 1.2.3, 1.3.1.1, 1.3.3, 3.1.1, 3.1.2.1, 3.2.5.2, 3.2.5.3, 3.3.2, 3.3.4.6, 3.3.5, 3.3.5.2, 3.3.7.1.1, 4.2.1, 4.2.3.1, 5, 7.2.1, 7.3.2.2, 7.4.1, 8, and 11.2 Tables 1.2-2, 1.2-3, 1.3-1, 3.2-1, 3.2-6, 3.2-9a, 3.2-9b, and 3.4-1 Figure 1.3-1c Appendix E (page E-2 Appendix M (Chapters M.1 thru M.14).	Addition of NUHOMS®-32PT DSC to the Standard NUHOMS® System.	COC 1004 Amendment No. 5	N/A
1, 1.2.3, 1.3.1.1, 1.3.3, 3.1.1, 3.1.2.1, 3.2.5.1, 3.2.5.2, 3.2.5.3, 3.3.2, 3.3.4.7, 3.3.5, 3.3.5.2, 3.3.7.1.1, 4.2.1, 4.2.3.1, 5, 7.2.1, 7.3.2.2, 7.4.1, 7.4.2, and 8. Tables 1.2-2, 1.2-3, 1.3-1, 3.2-1, and 3.4-1 Figures 1.3-1, and 4.2-5 Appendix E (page E-2) Appendix N (Chapters N.1 thru N.14).	Addition of NUHOMS®-24PHB DSC to the Standard NUHOMS® System.	COC 1004 Amendment No. 6	N/A

Listing of Approved Amendment Changes Implemented in the Standardized NUHOMS® FSAR Revision 8

FSAR Section or Drawing Number	Description of Change	Evaluation Category	Applicable SRS/SE
1, Appendix K.1, K.1.2.1, K.1.5 (including drawings), K.1.6, K.2.1, K.2.2, K.3.1.1, K.3.6.1.10, K.3.6.2.3, K.3.6.3, K.3.7.5.3.2.1, K.3.7.5.3.2.2, K.3.8, K.4.1, K.4.8, K.4.9, K.5, K.5.2, K.5.2.4, K.5.4.1, K.5.5.4, K.5.6, and K.6.2 Tables K.2-1 thru 3 & 8 & 11, K.3.6-5 thru 7, K.4-7, K.5-1 & 20 thru 23, K.6-2 & 3 & 6. Figures K.3.6-27 & 28, K.4-10 thru 12, K.5-16 & 17, and K.6-4.	Addition of new fuel types and damaged fuel to list of authorized contents for the standard NUHOMS® -61BT System.	COC 1004 Amendment No. 7	N/A