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January 4, 2010

U.S. Nuclear Regulatory Commission ATTN: Document Control Desk Washington, DC 20555-0001

Subject:

USNRC Docket Nos. 72-1008 and 72-1014 HI-STAR 100 Certificate of Compliance 1008 HI-STORM 100 Certificate of Compliance 1014

HI-STAR 100 System 10 CFR 72.48(d)(2) Biennial Report HI-STORM 100 System 10 CFR 72.48(d)(2) Biennial Report

References:

1. Holtec Project 5014

2. Holtec Letter 5014640

Dear Sir:

In accordance with 10 CFR 72.48(d)(2), Holtec International herewith submits the biennial report of changes, tests, and experiments implemented for the HI-STAR 100 and HI-STORM 100 Systems under the provisions of 10 CFR 72.48. The attached report summarizes all changes tests, and experiments implemented by Holtec under the provisions of 10 CFR 72.48 for the HI-STAR 100 and HI-STORM 100 Systems between January 1, 2008 and December 31, 2009.

It is noted that the last such biennial report (Reference 2) was submitted on January 4, 2008, and that the period between these filings is consistent with the 10 CFR 72.48(d)(2) reporting requirement.

Sincerely,

Tammy S. Morin

Licensing Manager, Holtec Technical Services

Holtec International

Attachment:

Biennial Summary of Changes, Tests, and Experiments Pertaining to the HI-STAR

100 and HI-STORM 100 Dry Cask Storage Systems

Document ID: 5014694

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Attachment 1- Biennial Summary of Changes, Tests, and Experiments Pertaining to the HI-STAR 100 and HI-STORM 100 Dry Cask Storage Systems

NRC Docket Nos. 72-1008 and 72-1014

10 CFR 72.48(d)(2) Report

Notes on the 10 CFR 72.48(d)(2) Report:

- 1. The first two columns of the report are the Holtec 72.48 number assigned (sequentially) to the change, test or experiment and the corresponding latest revision.
- 2. The third column of the report is the dry cask certificate number impacted by the change, test or experiment.
- 3. The fourth column of the report is the Holtec Project Number for the component(s) impacted by the change, test or experiment. These are:
 - a. 1020 HI-STAR Overpack
 - b. 1021 MPC-68/68F/68FF
 - c. 1022 MPC-24/24E/24EF
 - d. 1023 MPC-32/32F
 - e. 1024 HI-STORM 100/100S/100S Version B Overpack
 - f. 1025 HI-TRAC 125/125D Transfer Cask
 - g. 1026 HI-TRAC 100/100D Transfer Cask
 - h. 1027 Ancillary Equipment
 - i. 5014 Generic
- 4. The fifth column of the report lists if the change, test or experiment was initiated by an engineering change order (ECO) or a manufacturing deviation (SMDR).
- 5. The sixth column of the report lists if the change, test or experiment required a full evaluation (an adverse change) or only a screening (not an adverse change).
- 6. The seventh column of the report lists the affected component/s of the change, test or experiment.
- 7. The eighth and ninth columns of the report are the description of the change, test, or experiment and the summary of the evaluation (required for full evaluations only).

72.48 #	72.48 Rev.	CoC #s	Holtec Project	ECO or SMDR	7248 Type	Affected Component	Description of Change, Test or Experiment	Summary of Evaluation (Full Evaluations Only)
751	2	1014	5014	ECO	Full Evaluation	N/A	ENTRY. SECTION 9.2.5 - DELETE THE SECOND SENTENCE OF THE FIRST PARAGRAPH, REQUIRING THE FIVE YEAR EFFECTIVENESS TEST.	The evaluation concluded that the deletion of the periodic shielding effectiveness tests does not have any impact in the structural, thermal, shielding and criticality performance of the cask system. No existing accidents are affected in terms of either frequency or consequences. No new accidents are created. The overpack remains completely passive, so no malfunctions exist.

72.48 #	72.48 Rev.	CoC #s	Holtec Project	ECO or SMDR	7248 Type	Affected Component	Description of Change, Test or Experiment	Summary of Evaluation (Full Evaluations Only)
853	1	1014	1024	ECO	Full Evaluation	100S, 100S(Ver C.), and 100S (Ver. B) ANCHOR BLOCKS	Lifting Analyses" 4) In Subsection 3.4.3.5, change safety factor for "Lifting Block Threads - Top Lift - Region A (3D*)" from 3.00 to 2.11 in results summary table for "HI-STORM 100S Version B Top and Bottom Lifting Analyses" 5) In Subsection 3.4.3.5, change value for "Lifting Stud - Top	so no accident consequences can be increased. Methods of handling and operating the cask systems are not affected, so no new accidents can be created. Cask system temperatures, including fuel

72.48 #	72.48 Rev.	CoC #s	Holtec Project	ECO or SMDR	7248 Type	Affected Component	Description of Change, Test or Experiment	Summary of Evaluation (Full Evaluations Only)
	0	1014	1021	ECO	Full Evaluation	Fuel Spacers	The amount of weld applied between parts within the upper and lower fuel spacers during fabrication is proposed to be reduced to minimize distortion. The changes are as follows: Dwg.3923 Rev.18 [6] Sheet 5: Lower PWR fuel spacer assembly: Sector D7: Remove all around weld symbol from weld. Add 1" weld length to weld symbol and add "ON FOUR SIDES. OMIT CORNER RADIUS" to Weld. [7] Sheet 5: Lower PWR fuel spacer assembly: Sector C7: Add "TYP.(1" MIN. WELD LENGTH)" to the weld symbol. [8] Sheet 5: Upper PWR fuel spacer assembly: Sector B7: Remove the all around weld symbol from weld. Add 1" weld length to weld symbol and add "FOUR PLACES" to the weld symbol. Remove the leader branch showing weld between the top plate and the bolt and add a separate 1/8" fillet weld between the top plate and the bolt roread "VT ALTERNATING HEX FACES (1/2" MIN. WELD LENGTH)". [9] Sheet 5: Upper PWR fuel spacer assembly: Sector AB-7: Remove the all around weld symbol from weld. Add 1" weld length to weld symbol and add "FOUR PLACES" to the weld symbol. [10] Sheet 5: Lower BWR fuel spacer assembly: Sector D3: Remove all around weld symbol from weld. Add 1" weld length to weld symbol and add "ON FOUR SIDES. OMIT CORNER RADIUS" to Weld. [11] Sheet 5: Lower BWR fuel spacer assembly: Sector C3: Remove all around weld symbol from weld. Add 1" weld length to weld symbol and add "ON FOUR SIDES. OMIT CORNER RADIUS" to Weld. [12] Sheet 5: Upper BWR fuel spacer assembly: Sector B3: Remove the all around weld symbol from weld. Add 1" weld length to weld symbol and add "FOUR PLACES" to the weld symbol. Remove the leader branch showing weld between the top plate and the bolt and add a separate 1/8" fillet weld between the top plate and the bolt to read "VT ALTERNATING HEX FACES (1/2" MIN. WELD LENGTH)".	There are no malfunctions associated with the HI-STORM system due to the proposed activity and so no malfunction likelihood, consequences or results can be increased. The containment boundary remains unchanged, so no accident consequences can be increased. Methods of handling and operating he cask systems are not affected, so no new accidents can be created. Cask system temperatures, including fuel cladding, are not increased and MPC internal pressures are not increased, so no fission product boundary limit is exceeded. No new evaluation methods are used.

72.48#	72.48 Rev.	CoC #s	Holtec Project	ECO or SMDR	7248 Type	Affected Component	Description of Change, Test or Experiment	Summary of Evaluation (Full Evaluations Only)
869	0	1014	1025	ECO	Full Evaluation	FOR HI- TRAC 125D,	It is proposed to make the following changes to the HI-TRAC 125D:	SA564-630-H1100 has a lower strength than the currently licensed SA637-N07718
	may conditional account					HI-TRAC 125D Pool lid	Dwg. 3768 Rev.7 [1] Sheet 2: Sector BC-4: Added "OR SA564-630-H1100" to the	Therefore, the addition of SA564-630-H1100 as an acceptable HI-TRAC 125D
•			WHILAUI		monautori, apparato		leader showing the trunnion size and material.	trunnion material will
			· vola. As		The state of the s		[2] Sheet 4: Detail D: Added optional drain hole to the pool lid.	adversely impact the structural integrity of the trunnion and
			No. de				As a result of the above design changes the FSAR text is changed as follows:	consequently require a full evaluation. While the strength of the trunnion is reduced with
						; ; ;	[3] Table 2.2.6: Change the Material column for Lifting Trunnion to "SB637N07718 OR SA564-630H1100(For HI-TRAC125D only)".	the use of SA564-630-H1100, the trunnion strength still meets the applicable stress limits. As
		-				1	[4] Section 3.1.2.3: Page 3.1-20 Second paragraph: Adding optional material for HI-TRAC trunnion, change the sentence to	such, the SA564-630-H1100 material is acceptable for use
	The same of the sa		·		:		read "The HI-TRAC lifting trunnion is fabricated from a high strength nickel alloy material as specified in Table 2.2.6."	on the HI-TRAC 125D trunnions.
			1		,		[5] Table 3.4.2: Add "SA-564-630H1100 (for HI-TRAC125D only)" to Material/Component column for Lifting trunnions.	
			S	1			[6] Page 3.4-4: Add table with shear and bending stress results for HI-TRAC 125D Lifting Trunnions.	
							[7] Table 3.3.4: Add properties for the SA564-630H1100	

72.48 #	72.48 Rev.	CoC #s	Holtec Project	ECO or SMDR	7248 Type	Affected Component	Description of Change, Test or Experiment	Summary of Evaluation (Full Evaluations Only)
872	0	1014	5014	ECO	Screening Only	GENERIC DFC	MODIFY THE HI-STORM FSAR TO ELIMINATE REFERENCES TO LIFTING OF LOADED, HOLTEC-DESIGNED GENERIC DAMAGED FUEL CONTAINERS. THE FOLLOWING SPECIFIC CHANGES THROUGHOUT THE FSAR HAVE BEEN IDENTIFIED. TABLE 1.0.1 - REMOVE LIFTING FROM DEFINITION	SCREENING ONLY, NOT APPLICABLE.
							SECTION 2.1.3 - REMOVE "TO AID IN LOADING AND UNLOADING," SECTION 2.2.3.4 - REMOVE "PRIOR TO PLACEMENT IN THE MPC." SECTION 3.4.4.3.1.9 - REMOVE LIFTING OF GENERIC DFCS SECTION 5.0 - 2ND PARA - REMOVE "PRIOR TO BEING LOADED INTO THE MPC." SECTION 6.2.4 - REMOVE "PRIOR TO BEING LOADED INTO THE MPC." SECTION 6.4.2.4 - 2ND PARA - REPLACE "PRE-LOADED"	
				:			WITH "LOADED" SECTION 6.4.4 - REMOVE "PRIOR TO BEING LOADED INTO THE MPC." SECTION 7.1.5 - 2ND PARA - REMOVE "TO AID IN LOADING AND UNLOADING," SECTION 8.0 - 8TH PARA - REMOVE HANDLING OF FUEL IN DFCS.	

72.48 #	72.48 Rev.	CoC #s	Holtec Project	ECO or SMDR	7248 Type	Affected Component	Description of Change, Test or Experiment	Summary of Evaluation (Full Evaluations Only)
874	0	1014	5014	ECO	Screening Only	MPC-68, MPC-32, MPC-24	It is proposed to remove the fuel buckling analysis from the HI-STORM 100 FSAR. As a result the following text changes are required: Section 2.0: [1] page 2.0-2: delete 4th paragraph starting "The structural analysis [2] page 2.0-19, Table 2.0.1, Retrievability: In column marked Criteria delete "or Exceeding Fuel Assembly Deceleration Limits"; In column marked Basis delete ",(h)(1),"; In column marked FSAR Reference delete ", 3.5," [3] page 2.0-25, Table 2.0.2, Retrievability: In column marked Criteria delete "or Exceeding Fuel Assembly Deceleration Limits"; In column marked Basis delete ",(h)(1),"; In column marked FSAR Reference delete ", 3.5," [4] page 2.0-30, Table 2.0.3, Retrievability: In column marked Criteria delete "or Exceeding Fuel Assembly Deceleration Limits"; In column marked Basis delete ",(h)(1),"; In column marked FSAR Reference delete ", 3.5," Section 3.5 [5] Add 2 paragraphs and delete the rest of the Section as per Attachment A to ECO-5014-152 Section 3.8 [6] Delete References [3.5.1] and [3.5.2] Section 6.4 [7] Paragraph 6.4.2.4, Modify 2nd paragraph, 3rd sentence to read "The fuel cladding satisfies the "acceptance criteria to limit spent fuel reconfiguration in storage casks" (ISG-11, Rev. 3), since temperatures remain below their design limits (as demonstrated in Chapter 4)." - See Attachment A to ECO 5014-152 for further clarification.	
878	0	1014	5014	ECO	Screening Only	HI-STORM concrete	It is proposed to make the following text change to Appendix 1.D of the HI-STORM FSAR Rev. 6: [1] Appendix 1.D, Section 1.D.5: Replace the 3rd and 4th sentence with the following, "Additionally, compressive test cylinder samples shall be taken of a quantity to support required break tests as detailed in the governing Holtec procedure and will ensure a representative sample of the concrete is tested in accordance with ACI 349-85. At a minimum one set of samples must be taken for each HI-STORM."	N/A

72.48 #	72.48 Rev.	CoC #s	Holtec Project	ECO or SMDR	7248 Type	Affected Component	Description of Change, Test or Experiment	Summary of Evaluation (Full Evaluations Only)
879	O	1014	5014	SMDR	Screening Only	MPC 68, 24, & 32 sheathing welds	As detailed in SMDRs 1723 thru 1725, 1731 thru 1734, and 1740, the top and bottom sheathing welds for the affected units may be shorter than the respective licensing drawing requirements for each MPC. It is proposed to accept the possible deviations from the minimum top and bottom sheathing weld lengths as is.	N/A :
880	0	1008	1125	ECO	Screening Only	MPC Lid-to- Shell Weld	The HI-STAR FSAR requires that the post hydrostatic testing PT examination of the MPC lid-to-shell weld be performed while maintaining the minimum hydrostatic test pressure of 125 psig. It is proposed to eliminate the requirement for maintaining the hydrostatic pressure and perform the post hydrostatic test PT examination while the MPC is depressurized.	N/A
	1	A the factor of	:	Autoritation of the Control of the C			The following text change is made to Section 9.1.2.2.2, paragraph 1, sentence 6 of the HI-STAR FSAR Rev. 3:	
	The state of the s				THE TANKS AND A TA		[1] Sentence revised to read as follows, "Following completion of the 10-minute hold period at the hydrostatic pressure, and while maintaining a minimum test pressure of 125 psig, the surface of the MPC lid-to-shell weld shall be visually examined for leakage. Following completion of the hydrostatic testing and depressurization of the MPC, the surface of the MPC lid-to-shell weld shall be re-examined by dye penetrant examination."	

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882	0 .	1014	1021	ECO	Screening Only	MPC 68, 24, & 32 sheathing	It is proposed to shorten the minimum required weld length for the top and bottom sheathing welds. The changes are as follows:	N/A
						welds	Dwg.3928 Rev.11 [1] Sheet 2: Sector D4: Change the Weld note to read MINIMUM WELD LENGTH REQUIRED FOR EACH WELD AT TOP AND BOTTOM SHEATHING TO CELL WALL IS 3-5/16".	
							Dwg.3926 Rev.9 [2] Sheet 3: Sector C7: Delete the MINIMUM WELD LENGTH table. Change the Weld note to read MIN. WELD LENGTH REQUIRED FOR EACH WELD AT TOP & BOTTOM SHEATHING TO CELL WALL IS 3-3/4". [3] Sheet 3: Detail F: Add "OR GROOVE" to the weld symbol.	
							Dwg.3925 Rev.7 [4] Sheet 3: Sector C7: Delete the MINIMUM WELD LENGTH table. Change the Weld note to read MIN. WELD LENGTH REQUIRED FOR EACH WELD AT TOP & BOTTOM SHEATHING TO CELL WALL IS 3-3/4". [5] Sheet 3: Detail F: Add "OR GROOVE" to the weld symbol.	
				1	,		Dwg.3927 Rev.14 [6] Sheet 3: Sector D3: Change the Weld note to read MINIMUM WELD LENGTH REQUIRED FOR EACH WELD AT TOP AND BOTTOM SHEATHING TO CELL WALL IS 4-13/16".	,
884	0	1014	5014	ECO '	Screening Only	MPC	It is proposed to remove the option to exhaust or evacuate the space beneath the MPC lid while performing the MPC lid-to-shell weld.	N/A

72.48 #	72.48 Rev.	CoC #s	Holtec Project	ECO or SMDR	7248 Type	Affected Component	Description of Change, Test or Experiment	Summary of Evaluation (Full Evaluations Only)
885	0	1014	5014	ECO	Full Evaluation	MPC lid	I. Modify MPC Enclosure Vessel Licensing Drawing 3923 to include alternate construction MPC split lid with a carbon steel bottom piece encased within stainless steel. Alternate construction lid will have a minimum total thickness of 9-1/2" and will be composed of two layers (1) An upper structural stainless plate at 4-3/4" thick. This layer is part of the confinement boundary.	There are no malfunctions associated with the HI-STORM system due to the proposed activity and so no malfunction likelihood, consequences or results can be increased. The containment boundary remains unchanged,
							(2) A lower carbon steel shielding block at 4-3/4 thick. This layer will be affixed to the upper plate via an all-around non-structural groove weld. All surfaces that may come in contact with spent fuel pool water will be coated or covered with stainless steel. If needed, this layer will also have threaded holes for upper fuel spacers.	so no accident consequences can be increased. Methods of handling and operating the cask systems are not affected, so no new accidents can be created. Cask system temperatures, including fuel
C	-						The outer dimensions and features (chamfers, holes, weld preps, etc.) of the alternate construction split lid shall be identical to the standard construction (i.e., one-piece) lid.	cladding, are not increased and MPC internal pressures are not increased, so no fission product boundary limit is exceeded.
			We will be a second of the sec			C	II. Modify the HI-STORM FSAR as necessary to include the alternate split lid construction with a carbon steel bottom piece.	No new evaluation methods are used.

10 CFR 72.48(d)(2) Report for the HI-STAR 100 and HI-STORM 100 Cask Systems

72.48 #	72.48 Rev.	CoC #s	Holtec Project	ECO or SMDR	7248 Type	Affected Component	Description of Change, Test or Experiment	Summary of Evaluation (Full Evaluations Only)
890	0	1014	1025	ECO	Full Evaluation	HI-TRAC 125D	It is proposed to introduce two new optional HI-TRAC 125D designs; one which utilizes lead sheet in lieu of poured lead in the HI-TRAC body and another which utilizes lead sheet as in the first new option and also includes modifications to allow for use of the HI-TRAC in conjunction with a Variable Elevation Cask Staging Pedestal (VECASP). Additional changes are also proposed as listed in ECOs 1025-59,1025-61, and 1025-62. As a result of the new optional designs and the ECO changes previously mentioned, changes to the HI-TRAC 125D licensing drawing are necessary. These changes are detailed in ECO-1025-58 and ECO-1025-60 and are specifically screened/evaluated in this 72.48 in order to implement the new designs. The following is a summary of the proposed changes: [1] Add optional HI-TRAC 125D design which utilizes lead sheets and a modified water jacket / rib design in lieu of poured lead. [2] Add optional designs for base flange and four radial base gussets to allow the use of HI-TRAC with a Variable Elevation Cask Staging Pedestal (VECASP). [3] Reduce some weld sizes which are unnecessarily large in order to minimize distortion. [4] Change some dimensions to "REF", "NOM", or completed remove them from the drawing. These dimensions are not of the level detail required of a licensing drawing. The introduction of layered lead sheets in the HI-TRAC body requires text changes to chapter 9 of the FSAR as presented in ECO-5014-170. See the following 72.48 screening/evaluation for	There are no malfunctions associated with the HI-STORM system due to the proposed activities and so no malfunction likelihood, consequences or results can be increased. The containment boundary remains unchanged, so no accident consequences can be increased. Methods of handling and operating the cask system are not affected, so no new accidents can be created. Cask system temperatures, including fuel cladding, are not increased and MPC internal pressures are not increased, so no fission product boundary limit is exceeded. No new evaluation methods are used.
892	1	1014	5014	ECO	Screening Only	HI-STORM 100	a complete listing of all the changes. It is proposed to revise Section 3.1.2.3 and Table 3.1.18 of the HI-STORM FSAR to allow the use of as-rolled SA516 Gr. 70 plates and to clarify the fracture toughness criteria when this material is used to fabricate the HI-STORM overpack. In particular, impact testing is not required when as-rolled SA516 Gr. 70 plates are used for the HI-STORM inner and outer shells, top plate, lid shear ring, lid shield ring, lid outer ring (for 100 S Version B), and lid cover plate (for 100 S Version B). REVISION 1-Added the lid shield ring to the list of as-rolled plates above.	

72.48#	72.48 Rev.	CoC #s	Holtec Project	ECO or SMDR	7248 Type	Affected Component	Description of Change, Test or Experiment	Summary of Evaluation (Full Evaluations Only)
898	0	1008 & 1014	1023	ECO	Screening Only	BWR and PWR Lower Fuel Spacers	It is proposed to introduce a new optional lower fuel spacer design for both BWR and PWR fuel assemblies. This optional design replaces the current lower fuel spacer columns and lower plates with an I-beam. The top plates remain the same and are welded to the I-beams with 1/8" fillet welds. See the sketch attached to ECO-1023-58, 1021-100, and 1022-79 (the sketch is the same for all ECOs) for complete details of the proposed design.	N/A
927	0	1014	5014	ECO	Screening Only	MPC enclosure vessel	ECO-5014-124 Rev 1 reinstated helium leakage testing of the MPC shell and MPC shell to baseplate welds for MPCs with heat loads greater than 20kW, It is now proposed to add helium leakage testing for MPCs with heat loads less than or equal to 20kW. The following FSAR text changes are required to implement the proposed activity: 1. Section 1.0.3, Table 1.0.3, Item 7.V.4, Justification - Delete "This test is not required for MPCs with heat loads <= 20kW." 2. Section 2.0.1, Structural topic - page 2.0-2 - Delete "This test is not required for MPCs with heat loads <= 20kW." 3. Section 2.0.1, Confinement topic - page 2.0-5 - Delete "This test is not required for MPCs with heat loads <= 20kW." 3. Table 2.0.1, Leak Testing, Welds Tested Delete "This test is not required for MPCs with heat loads <= 20kW." 4. Section 7.1.1, before fourth Paragraph - Delete "This test is not required for MPCs with heat loads <= 20kW." 5. Section 7.1.3, 2nd Paragraph, prior to "The vent and drain" Delete "This test is not required for MPCs with heat loads <= 20kW." 6. Table 9.1.1, Leak Tests; Fabrication Column - Delete "This test is not required for MPCs with heat loads <= 20kW." 7. Section 9.1.3 - After 1st paragraph Delete "This test is not required for MPCs with heat loads <= 20kW."	