

System Verification Plan and Report

Project Second Target Station

Item Target Shaft

WBS S.03.02.04

Lead Aaron Jacques
Date 7/31/2026

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Date			Reqmts Review			Final Design Review			Dwg release			Vendor			MUTS			In Core Vessel		
			SRR			FDR			PRR			FAT			Installation Test			Integrated System Test		
ID	Name	Requirement	Method	STATUS	Date	Method	STATUS	Date	Method	STATUS	Date	Method	STATUS	Date	Method	STATUS	Date	Method	STATUS	Date
10961	[S.03.02.04-10961] Maximum Mass	Target shaft components (after meeting maximum dimension requirements) shall not exceed 2000kg.	-	-	-	Analysis	PASSED	7/26/2026	Analysis	Not Run	-	-	-	-	-	-	-	-	-	-
10957	[S.03.02.04-10957] Welded construction	The shaft shall have welded connections. No gaskets or seals shall be used within the shaft. "Note: Segment~~drive connections are not part of the shaft."	-	-	-	Inspection	PASSED	7/26/2026	Inspection	Not Run	-	-	-	-	-	-	-	-	-	-
10951	[S.03.02.04-10951] Pocket Clearance	The shaft pocket shall provide clearance of ~>0.5mm to the segment pin when fully installed; prior to rotation. "The shaft pocket shall permit free location (without binding) of the segment pin du	-	-	-	Inspection	PASSED	7/26/2026	Inspection	Not Run	-	-	-	-	Demonstration	Not Run	-	-	-	-
10795	[S.03.02.04-10795] Snubber vertical installation tolerance	The restraint ring shall placed within +/-~0.5 mm vertically of the nominal location relative to the global coordinate system.	-	-	-	Inspection	PASSED	7/24/2026	Inspection	Not Run	-	-	-	-	-	-	-		Not Run	-
10794	[S.03.02.04-10794] Vertical snubber clearance	The shaft and snubber shall have a nominal 8mm vertical clearance between restraint and shaft	-	-	-	Inspection	PASSED	7/24/2026	Inspection	Not Run	-	-	-	-	-	-	-	-	-	-
10758	[S.03.02.04-10758] Structural integrity during seismic event	The shaft (and drive) must retain structural capacity during an operational seismic event with an imposed horizontal displacement of ~>+/-13mm between the mounting surface of the target assembly to t	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10749	[S.03.02.04-10749] Shaft runout	The shaft (all cylindrical features) shall have a geometric runout <0.875mm about the axis of rotation established by the crown bearing surfaces.	-	-	-	Inspection	PASSED	7/24/2026	Inspection	Not Run	-	-	-	-	-	-	-	-	-	-
10748	[S.03.02.04-10748] Vertical Shaft Deflection - Normal Operations	The shaft including structural portions of the drive) shall deflect <2mm (down) and <0.2 (up) for the worst case combination of:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10747	[S.03.02.04-10747] Horizontal Shaft Deflection - Normal Operations	The shaft including structural portions of the drive) shall deflect <0.5mm in the horizontal direction for the worst case combination of: * L ~- Live loads (imbalance target rotation) * P ~- Opera	-	-	-	-	-	-	-	-	-	-	-	-	Test	Not Run	-	-	-	-
10746	[S.03.02.04-10746] Snubber horizontal installation tolerance	The restraint ring shall placed within +/-~1mm horizontally of the nominal location relative to the global coordinate system.	-	-	-	Inspection	PASSED	7/24/2026	Inspection	Not Run	-	-	-	-	-	-	-	-	-	-
10745	[S.03.02.04-10745] Snubber adjustment	The target assembly restraint shall have ~>+/-3.5mm of radial and ~>+/-1.5mm of vertical adjustment during installation between the shielding mounting features and the pocket for the target shaft.	-	-	-	Inspection	PASSED	7/24/2026	Inspection	Not Run	-	-	-	-	-	-	-		Not Run	-
10742	[S.03.02.04-10742] Radial snubber clearance	The shaft and snubber shall have a nominal 6mm radial clearance between restraint and shaft. "NOTE: The shaft is to only contact the restraint in a seismic event to prevent contact with the	-	-	-	Inspection	PASSED	7/24/2026	Inspection	Not Run	-	-	-	-	-	-	-	-	-	-
10238	[S.03.02.04-10238] Maximum dimensions	Components shall have maximum dimensions when removed from the core vessel of Ø685mm x 2270mm or be capable of reduction to the indicated maximum length.	-	-	-	Inspection	PASSED	7/26/2026	Inspection	Not Run	-	-	-	-	-	-	-	-	-	-
10230	[S.03.02.04-10230] Transportation in 3-60B	Perishable components shall be capable of transportation within the Energy Solutions 3~~60B transportation cask.	-	-	-	Analysis Analysis	Not Run	-	Analysis Analysis	Not Run	-	-	-	-	-	-	-	-	-	-
7092	[S.03.02.04-7092] Lower Shaft Load-Bearing Integrity	The shaft shall be designed to bear its own weight~, and the weight of 20 target segments on the lower most surface of the shaft. "Note: The bottom seismic nub must not collapse when the shaft and	-	-	-	-	-	-	-	-	-	-	-	-		Not Run	-	-	-	-
3845	[S.03.02.04-3845] Segment Guiding	The shaft shall provide alignment features to assist in aligning the segment during installation with tapered holes~, alignment	-	-	-	Inspection	PASSED	7/26/2026	Inspection	Not Run	-	-	-	-	Demonstration	Not Run	-	-	-	-
2088	[S.03.02.04-2088] Shaft Diameter	The shaft diameter shall be less than the opening in the core vessel lid. "NOTE: This feature enables the shaft to be removed from the core vessel without removing the core vessel lid."	-	-	-	Inspection	PASSED	7/27/2026	Inspection	Not Run	-	-	-	-	-	-	-	-	-	-
2029	[S.03.02.04-2029] Material Radiation Damage	The accumulated radiation dose (or damage) for each shaft component and its constituent materials~, evaluated at that component's end of life (i.e.~, at the planned replacement or retirement point)~,	-	-	-	Analysis	PASSED	7/24/2026	Analysis	Not Run	-	-	-	-	-	-	-	-	-	-
1694	[S.03.02.04-1694] Shaft Spurious Stop	The shaft shall not undergo permanent deformation after a sudden stop~, where a stop is defined as a deceleration from full speed using the peak torque of the motor.	-	-	-	Analysis	PASSED	7/26/2026	Analysis	Not Run	-	-	-	-	Demonstration	Not Run	-	-	-	-
1693	[S.03.02.04-1693] Drive Segment Connection Spurious Stop Survival	The connection between the segment and the drive shall not undergo permanent deformation after a sudden stop~, where a stop is defined as a deceleration from full speed using the peak torque of the mo	-	-	-	Analysis	PASSED	7/26/2026	Analysis	Not Run	-	-	-	-	Demonstration Test	Not Run	-	-	-	-

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