

System Verification Plan and Report

Project Second Target Station
Item Target Segment
WBS S.03.02.03
Lead Aaron Jacques
Date 7/31/2026

			Reqmts Review			8/13/2026	Final Design Review			8/13/2026	Dwg release			8/14/2027	Vendor			8/14/2027	MUTS			8/14/2027	In Core Vessel			8/14/2027
			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	
11214	[S.03.02.03-11214] Disposal Method	The target segment shall be capable of disposal at a waste facility at the end of life.	-	-	-		Inspection	Not Run	-		Inspection	Not Run	-		-	-	-		-	-	-		-	-	-	
10959	[S.03.02.03-10959] Maximum Mass	Segment mass not to exceed 1100kg. 	-	-	-		Analysis	PASSED	7/25/2026		Analysis	Not Run	-		-	-	-		-	-	-		-	-	-	
10950	[S.03.02.03-10950] Segment Pin	The segment shall be capable of installation when placed within 10mm of the shaft restraint pocket. The segment shall provide 5mm of lead in to guide the segment.	-	-	-		Inspection	PASSED	7/26/2026		Inspection	Not Run	-		-	-	-		Demonstration	Not Run	-		-	-	-	
10949	[S.03.02.03-10949] Water Seal Leak Rate	The interfaces for each segment to the drive system shall have a leak rate of <4 x 10 ~^ ~-6 mbar~-l/s or less.	-	-	-		-	-	-		-	-	-		Test	Not Run	-		-	-	-		-	-	-	
10759	[S.03.02.03-10759] Segment Foot - Horizontal Deflection - Seismic Event	The foot shall deflect < 0.25mm radially outward during an operating seismic event.Seismic event includes the worst case combinations of * L ~- Live loads (centrifugal target rotation)	-	-	-		Analysis	PASSED	7/31/2026		Analysis	Not Run	-		-	-	-		-	-	-		-	-	-	
10757	[S.03.02.03-10757] Segment Mid Height - Radial Deflections - Seismic Event	The segment shall deflect <7mm radially outward for the worst case combination of:	-	-	-		Analysis	PASSED	7/31/2026		Analysis	Not Run	-		-	-	-		-	-	-		-	-	-	
10756	[S.03.02.03-10756] Segment Mid Height - Radial Deflections - Normal Operation	The segment shall deflect <4.5mm radially outward for the worst case combination of:	-	-	-		Analysis	PASSED	7/31/2026		Analysis	Not Run	-		-	-	-		Test	Not Run	-		-	-	-	
10755	[S.03.02.03-10755] Profile Tolerance - Segment Mid Height	The vertical outer boundaries of the segment foot shall be within +/-~0.5mm of the locating features (bolted joint and guide pin).	-	-	-		-	-	-		Inspection	Not Run	-		-	-	-		-	-	-		-	-	-	
10752	[S.03.02.03-10752] Segment foot - Vertical deflection - Seismic Event	Any portion of the target foot shall deflect ~<~3.6mm (down) or <0.55mm (up) during a seismic event. Seismic conditions include the worst case combinations of: * L ~- Live loads (centrifugal tar	-	-	-		Analysis	PASSED	7/31/2026		Analysis	Not Run	-		-	-	-		-	-	-		-	-	-	
10751	[S.03.02.03-10751] Segment Foot - Vertical Deflections - Normal Operation	The segment foot shall deflect ~<~3.2mm (down) and <0.2mm (up) during worst case combinations of:	-	-	-		Analysis	PASSED	7/31/2026		Analysis	Not Run	-		-	-	-		-	-	-		-	-	-	
10750	[S.03.02.03-10750] Foot Profile	The horizontal outer boundaries of the segment foot shall be within +/-~0.2mm of the locating features (bolted joint). 	-	-	-		-	-	-		Inspection	Not Run	-		Inspection	Not Run	-		-	-	-		-	-	-	
10222	[S.03.02.03-10222] Transporation 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	-		-	-	-		-	-	-		-	-	-	
3851	[S.03.02.03-3851] Seal Leak Check	The sealing surface between the segment and the drive shall have a method of leak testing. Note: Venting and removal of the core vessel lid is permitted.	-	-	-		Inspection	FAILED	7/26/2026		Inspection	Not Run	-		-	-	-		Demonstration	Not Run	-		-	-	-	
3850	[S.03.02.03-3850] Vertical Lift	The segment should be capable of removal from the core vessel without a coordinated jog of the lifting device.	-	-	-		Inspection	PASSED	7/26/2026		Inspection	Not Run	-		-	-	-		Demonstration	Not Run	-		-	-	-	
3848	[S.03.02.03-3848] Locating Features	The segment shall contain features that provide alignment during installation with little or no intervention by maintenance personnel.	-	-	-		Inspection	PASSED	7/26/2026		Inspection	Not Run	-		-	-	-		-	-	-		-	-	-	
3728	[S.03.02.03-3728] Pin Dimension	The dimension of the locating pin in the bottom of the segment shall be greater than 25mm.	-	-	-		Inspection	PASSED	7/26/2026		Inspection	Not Run	-		Inspection	Not Run	-		-	-	-		-	-	-	
3570	[S.03.02.03-3570] Maximum dimensions	Segment shall be capable of size reduction to less than Ø685mm x 2270mm. "NOTE: This sizing is to accommodate fitting into a disposal liner that will subsequently be loaded into the 3~-60B s	-	-	-		Inspection	PASSED	7/26/2026		Inspection	Not Run	-		-	-	-		-	-	-		-	-	-	
3466	[S.03.02.03-3466] Max Temperature without cooling & beam off	The steady~-state temperature in any portion of the tungsten shall not exceed 800C without cooling. (initiated immediately upon loss of beam).	-	-	-		Analysis	PASSED	7/24/2026		Analysis	Not Run	-		-	-	-		-	-	-		-	-	-	
3465	[S.03.02.03-3465] Hot contact	The target shall not contact Moderator components during a loss of cooling event without the beam under the following conditions:	-	-	-		Analysis	PASSED	7/24/2026		-	-	-		-	-	-		-	-	-		-	-	-	
3464	[S.03.02.03-3464] Water Tube Spacing	Water cooling tubes in the target block shall have spacing between tube centers no less than D/3 of the inlet pipe diameter. "NOTE: If a large piece of debris makes it down the supply pipe in the	-	-	-		Inspection	PASSED	7/24/2026		Inspection	Not Run	-		Inspection	Not Run	-		-	-	-		-	-	-	

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2301	[S.03.02.03-2301] Material Radiation Damage	The accumulated radiation dose (or damage) for each segment 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	-	-	-	-	-	-	-	-	-	-
1605	[S.03.02.03-1605] Segment Spurious Stop	The segment shall not undergo permanent deformation after a sudden stop~, where a stop is defined as a deceleration from	-	-	-	Analysis	PASSED	7/26/2026	-	-	-	-	-	-	Demonstration	Not Run	-	-	-	-
1604	[S.03.02.03-1604] Segment Ziplift	The segment shall have a threaded female hole~, 1.5" ~-8 UNC.	-	-	-	Inspection	PASSED	7/27/2026	-	-	-	-	-	-	-	-	-	-	-	-
1602	[S.03.02.03-1602] Segment Pressure Drop	The segment shall have a pressure drop of less than 62kPa at 28.4 L/min	-	-	-	Analysis	PASSED	7/26/2026	-	-	-	-	-	-	-	-	-	-	-	-
1600	[S.03.02.03-1600] Design Loads and Acceptance Criteria	The target segment (including attachment pin) shall be designed so that limit states (structural integrity) are maintained under all load combinations (including seismic). Loads and limit states are d	-	-	-	Analysis	PASSED	7/26/2026	-	-	-	-	-	-	-	-	-	-	-	-
1598	[S.03.02.03-1598] Target Location	The target shall match the location used in S03040000~-DAC10010.	-	-	-	Inspection	PASSED	7/26/2026	-	-	-	-	-	-	-	-	-	-	-	-
1597	[S.03.02.03-1597] Target Materials	Target materials shall match the geometry used in S03040000~-DAC10010	-	-	-	Inspection	PASSED	7/26/2026	-	-	-	-	-	-	-	-	-	-	-	-
1596	[S.03.02.03-1596] Target Geometry	Target Geometry shall match the geometry used in S03040000~-DAC10010	-	-	-	Analysis	PASSED	7/27/2026	-	-	-	-	-	-	-	-	-	-	-	-
1574	[S.03.02.03-1574] Segment Lifetime	Segment Fatigue margin shall be equal to or greater than 1 for a 10~-year operational life for all materials with the following load combinations: [!1770754257416.png#7f1453d7658169f3797d3147aa50ff	-	-	-	Analysis	FAILED	7/26/2026	-	-	-	-	-	-	-	-	-	-	-	-
1572	[S.03.02.03-1572] Segment Shear	The segment shall be capable of being severed with a shear in sections not to exceed 1905mm long.	-	-	-	-	-	-	-	-	-	Demonstration	Not Run	-	-	-	-	-	-	-
1570	[S.03.02.03-1570] Maintenance Temperatures	The surface temperature with the beam off after 10 years of operation and the following flow parameters shall not exceed 150C. -Flow Rate: 1 L/min -Inlet Flow Temperature: 33 degrees Celsius -Cooldown	-	-	-	Analysis	PASSED	7/26/2026	-	-	-	-	-	-	-	-	-	-	-	-
1567	[S.03.02.03-1567] Prevent Boiling Flow	The target cooling water shall be single~-phase (liquid).	-	-	-	Analysis	PASSED	7/26/2026	-	-	-	-	-	-	-	-	-	-	-	-
1504	[S.03.02.03-1504] Segment Replacement Time	Segment shall be capable of replacement within 240 hours	-	-	-	Analysis	PASSED	7/24/2026	Analysis	Not Run	-	-	-	-	Demonstration	Not Run	-	-	-	-
1501	[S.03.02.03-1501] Replaceable Gasket Interface	The sealing gasket between the segment and mount (crown) shall be capable of replacement without replacement of the segment.	-	-	-	Inspection	PASSED	7/26/2026	-	-	-	-	-	-	Demonstration	Not Run	-	-	-	-