

NCSX Fabrication Project
Work Breakdown Structure (WBS) Dictionary
Test Cell Preparations & Machine Assembly (WBS 7)

Revision 0

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Work Breakdown Structure (WBS) Dictionary Machine Assembly & Integrated Systems Testing (WBS 7)

WBS Element: 7		WBS Level: 2
WBS Title:	Test Cell Preparations and Machine Assembly	
Description:	<p>NCSX operations are divided into six phases:</p> <ol style="list-style-type: none"> 1. Initial Operation 2. Field Line Mapping 3. Initial Ohmic 4. Initial Auxiliary Heating 5. Confinement and Beta Push 6. Long Pulse <p>This summary-level WBS element consists of the necessary engineering and field labor to prepare the test cell and install the stellarator core systems, provide special machine assembly tools and equipment, and measurement systems. The Construction Manager is responsible for this WBS element. The Construction Manager shall participate in design reviews to assure the constructability of the NCSX facility.</p> <p>This WBS element includes the following sub-elements:</p> <ul style="list-style-type: none"> • Shield Wall Reconfiguration (WBS 71); • Control Room Refurbishment (WBS 72); • Platform Design and Fabrication (WBS 73); • Machine Assembly Planning and Oversight (WBS 74); • Test Cell Assembly Operations (WBS 75); • Tooling Design and Fabrication (WBS 76); and • Measurement Systems (WBS 77) 	

WBS Element: 71		WBS Level: 3
WBS Title:	Shield Wall Reconfiguration	
Description:	<p>This WBS element includes the activities associated with modifications to shield walls to be meet seismic and shielding requirements. The work scope includes:</p> <ul style="list-style-type: none"> • Reconfiguring and seismically supporting shield walls to meet seismic requirements; and • Increasing the height of the shield walls of the Test Cell as appropriate. <p><i>This work is being accomplished as a GPP Project.</i></p>	

WBS Element: 72		WBS Level: 3
WBS Title:	Control Room Refurbishment	
Description:	<p>This WBS element includes the refurbishment of the combined PLT/PBX-M control room areas to be used as the NCSX Control Room. This includes installation of new ceiling and new painted walls/partitions as required. <i>This work is being accomplished as a GPP Project.</i></p>	

WBS Element: 73		WBS Level: 3
WBS Title:	Platform Design and Fabrication	
Description:	<p>This WBS element consists of the activities associated with design and fabrication of the NCSX machine platform. This work scope encompasses the design and fabrication of a platform around the NCSX device, in support of various diagnostics and systems required for operation. It includes all platform material procurements.</p>	

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WBS Element: 74		WBS Level: 3
WBS Title:	Machine Assembly Planning and Oversight	
Description:	This WBS element includes those activities associated with planning the assembly and installation, of the NCSX device. It includes the coordination between WBS elements whose activities directly involve the assembly of the NCSX components in the NCSX test cell and basement. It also includes participation in design reviews by the Construction Manager to assure the constructability of the NCSX facility.	

WBS Element: 75		WBS Level: 3
WBS Title:	Test Cell Assembly Operations	
Description:	<p>This WBS element consists of those activities associated with the final assembly of the stellarator core in the NCSX Test Cell. Work scope includes the following activities in order of work to be performed:</p> <ul style="list-style-type: none"> • Installation and leveling of machine base plate • Installation and leveling of the machine support columns; • Installation of the machine platform • Installation of lighting and fire detection/suppression systems under the platform • Installation of the lower cryostat floor; • Installation of the lower PF-3 & 4 coils in preliminary positions; • Installation of the three (3) field periods • Labor support for WBS 22 for the performance of the pump down and vacuum leak test PTPs; • Placement of the lower PF-3 & 4 into their final position; • Installation of the upper PF-3 & 4 coils; • Installation of the PF-1 & PF-2 solenoid; and • Installation of external Cryostat walls and ceiling that may be installed as part of the Fabrication Project. <p>This WBS element does not include:</p> <ul style="list-style-type: none"> • Installation of any of the power or bus systems (WBS 4) • Installation of the bakeout and/or cooling systems (WMS 62) • Installation of the Cryo systems (WBS 63) • Installation of diagnostic systems 	

WBS Element: 76		WBS Level: 3
WBS Title:	Tooling Design & Fabrication	
Description:	<p>This WBS element consists of the activities associated with the design and fabrication of tooling required to assemble the NCSX device. The work scope includes the design and fabrication of special fixtures and tooling which will be required during final assembly of the NCSX machine components in the C-site NCSX test cell. To the extent feasible, special tooling utilized in the pre-assembly of the field periods in the TFTR test cell will be utilized.</p> <p>All procurements of miscellaneous items required for assembly such as safety equipment, general tools, hardware, disposable items, specific procurement of welding supplies (e.g., weld wire) and equipment required to assemble the NCSX device are included in this element.</p>	

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WBS Element: 77		WBS Level: 3
WBS Title:	Measurement Systems	
Description:	The NCSX Project intends to make full use of the fixturing and measurement systems designed and fabricated for pre-assembly operations (WBS 187). This WBS element only consists of those efforts required to design, procure and fabricate additional fixtures & tooling that may be required for position measurement of the stellarator core components in the NCSX test cell. At the present time, no additional effort is anticipated.	