

NCSX Work Breakdown Structure (WBS)

WBS	Description	Job Manager	RLM
1	Stellarator Core Systems		Heitzenroeder/Nelson
11	<i>In-Vessel Components</i>	No MIE Scope	
12	Vacuum Vessel Systems	Goranson	
	1201 Vacuum Vessel Prelim Dsn	Complete	
	1202 Vacuum Vessel R&D	Complete	
	1203 Vacuum Vessel Final Dsn	Complete	
	1204 VV Sys Procurements (non VVSA)	Dudek	Heitzenroeder
	1206 VV Field Weld Joint R&D	Complete	
	1250 Vac. Vessel Sub-Assys. (VVSA) Fab.	Complete	
	1260 NB Transition Duct	Goranson	Nelson
	1270 Port Heater Control System	Gernhardt	
13	Conventional Coils		
131	TF Coils	Kalish	Heitzenroeder
	1301 TF Design	Complete	
	1350 TF Coil Fab Prep	Complete	
	1351 TF Coil Fabr Supplies	Complete	
	1361 TF Fabrication	Kalish	Heitzenroeder
132	PF Coils	Chrzanowski	Heitzenroeder
	1302 PF Design	Complete	
	1352 PF Coil Procurement	Chrzanowski	Heitzenroeder
133	Trim Coils	Kalish	Heitzenroeder
	1354 Trim Coil Design & Procurement	Kalish	Heitzenroeder
134	Local I&C	Cole	Nelson
	1355 Conv. Coils I&C Proc & Coil Assy	Cole	Nelson
135	Central Solenoid Support Structure	Dahlgren	Heitzenroeder
	1303 Central Solenoid Support Dsn	Complete	
	1353 CS Structure Procurement	Dahlgren	Heitzenroeder
14	Modular Coils		
141	Modular Coil Winding Forms		
	1413 MCWF Fracture Analysis	Complete	
	1404 MCWF R&D & 1st Prod Casting	Complete	
	1411 MCWF Fabrication	Complete	
142	Modular Coil Fabrication	Chrzanowski	Heitzenroeder
	1405 Mod Coil Winding R&D Prep	Complete	
	1415 Dim Cntrl Testing	Complete	
	1406 Mod. Coil Winding R&D	Complete	
	1408 Mod Coil Winding Supplies	Chrzanowski	Heitzenroeder
	1410 MC Twisted Racetrack Fabr	Complete	
	1451 Mod Coil Winding	Chrzanowski	Heitzenroeder
	1459 Mod Coil Fabr. Punch List	Chrzanowski	Heitzenroeder
	1409 Coil Test Stand	Complete	
	1414 Coil Testing	Complete	
143	Modular Coil Design	Williamson / Cole	
	1401 Mod Coil Prel.Dsn	Complete	
	1402 Mod.Coil Analyses	Complete	
	1403 Modular Coil Final Design	Complete	
	1416 Mod Coil Type A&B Final Dsn		Nelson
	1421 Mod Coil Interface Design		Nelson
144	Modular Coil Fabrication Facility		
	1407 Mod Coil Winding Facility	Complete	
	1419 Winding Fac. Mods	Complete	
	1412 Complete Winding Facilities	Complete	
	1460 3rd Winding Fixture	Complete	
145	Modular Coil Interfaces		
	1431 Mod. Coil Interface Hardware Procurement	Dudek	Heitzenroeder
	1429 Mod. Coil Interface R&D	Complete	
15	Coil Support Structures		
	1501 Coil Structures Design	Dahlgren	Heitzenroeder
	1550 Coil Structures Procurement	Dahlgren	Heitzenroeder
16	Coil Services	Goranson	Nelson
	1601 Coil Services Design & Procurement	Goranson	Nelson
161	LN2 Distribution System	Goranson	Nelson
162	Coil Electrical Leads	Goranson	Nelson
163	Coil Protection Requirements	Goranson	Nelson

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17	<i>Cryostat and Base Support Structure</i>				
171	<i>Cryostat</i>			Raftopoulos	Heitzenroeder
	1701	Cryostat Design		Raftopoulos	Heitzenroeder
	1751	Cryostat Procurement		Raftopoulos	Heitzenroeder
172	<i>Base Support Structure</i>			Dahlgren	Heitzenroeder
	1752	Base Support Structure Procurement		Dahlgren	Heitzenroeder
	1702	Base Support Structure Design		Dahlgren	Heitzenroeder
18	<i>Field Period Assembly</i>				
181	<i>Planning and Design</i>				
	1801	FPA Preliminary Design	Complete		
	1806	FPA specs & dwgs		Cole	Nelson
185	<i>Field Period Assembly Operations</i>			Viola	Heitzenroeder
	1802	FPA Oversight & Support		Viola	Heitzenroeder
	1810	FPA Ops @TFTR TC		Viola	Heitzenroeder
	18xx	FPAOps @NCSX TC		Viola	Heitzenroeder
	1804	Metrology Engineering	Complete		
186	<i>Tooling Design and Fabrication</i>			Brown	Heitzenroeder
	1803	FPA Tooling & Constructability		Brown	Heitzenroeder
	1805	FPA Hardware & Fixture Procurements		Brown	Heitzenroeder
19	<i>Stellarator Core Management and Integration</i>			Cole	Nelson
	1901	Stellarator Core Management and Integration		Cole	Nelson
191	<i>Stellarator Core Management</i>			Cole	Nelson
192	<i>Stellarator Core Design Integration</i>			Cole	Nelson
2	<i>Ancillary Systems</i>			Blanchard	Dudek
21	<i>Fueling Systems</i>			Blanchard	Dudek
211	<i>Gas Fueling Systems</i>				
	2101	Fueling Systems			
212		Pellet Injection Fueling Systems	No MIE Scope		
22	<i>Torus Vacuum Pumping System</i>			Blanchard	Dudek
	2201	Vacuum Pumping Systems			
23		<i>Wall Conditioning Systems</i>	No MIE Scope		
231		Glow Discharge Cleaning System	No MIE Scope		
232		Borazation System	No MIE Scope		
233		Lithiumization System	No MIE Scope		
24		<i>ICH System</i>	No MIE Scope		
25	<i>Neutral Beam Injection System</i>		Complete	Stevenson	
	2501	Neutral Beam Refurbishment	Complete		
26		<i>ECH System</i>	No MIE Scope		
27	<i>Auxiliary Systems Integration</i>				
	2001	Auxiliary Systems Oversight	Complete		
3	<i>Diagnostics</i>			Stratton	Dudek
31	<i>Magnetic Diagnostics</i>				
	3101	Magnetic Diagnostics			
32		<i>Fast Particle Diagnostics</i>	No MIE Scope		
33		<i>Impurity Diagnostics</i>	No MIE Scope		
34		<i>MHD Diagnostics</i>	No MIE Scope		
35		<i>Profile Diagnostics</i>	No MIE Scope		
36	<i>Edge and Divertor Diagnostics</i>				
	3601	Edge and Divertor Diagnostics			
37		<i>Turbulence Diagnostics</i>	No MIE Scope		
38	<i>Electron Beam (EB) Mapping</i>				
	3801	Electron Beam Mapping			
39	<i>Diagnostics Integration</i>				
	3901	Diagnostics sys Integration			

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WBS	Description		Job Manager	RLM
4	Electrical Power Systems		Ramakrishnan	vonHalle
41	AC Power			
	4101	AC Power		
411	Auxiliary AC Power Systems			
412	Experimental AC Power Systems			
43	DC Systems			
	4301	DC Systems		
431	C-Site DC Systems			
44	Control and Protection Systems			
	4401	Control & Protection		
441	Electrical Interlock Systems			
442	Kirk Key Interlocks			
443	Real Time Control Systems			
444	Instrumentation Systems			
445	Coil Protection Systems			
45	Power System Design and Integration			
	4501	Power Sys Dsn & Integr		
451	System Design and Interfaces			
452	Electrical Systems Support			
453	System Testing (PTPs)			
5	Central Facility I&C Systems		Sichta	vonHalle
51	TCP/IP Infrastructure Systems			
	5101	TCP/IP Infrastructure Systems		
52	Central Instrumentation and Control Systems			
	5201	I&C Systems		
53	Data Acquisition & Facility Computing Systems			
	5301	Data Acquisition		
54	Facility Timing and Synchronization Systems			
	5401	Facility Timing &		
55	Real Time Plasma and Power Supply Control Systems			
	5501	Real Time Control System		
56	Central Safety Interlock Systems			
	5601	Central Safety Interlock Systems		
57	Control Room Facility			
58	Central I&C Integration			
	5801	Central I&C Integr		
6	Facility Systems		Dudek	Dudek
61	Water Cooling Systems		Dudek	Dudek
611	C-Site Cooling Systems			
	6101	Water Systems		
	612	Neutral Beam Water Cooling System	No MIE Scope	
	613	Vacuum Pumping Water Cooling System	No MIE Scope	
	614	Bakeout Water System	No MIE Scope	
	615	Diagnostic Water Cooling System	No MIE Scope	
62	Cryogenic Systems		Raftopoulos	Dudek
	6201	Cryogenic Systems		
	6200	Cryostat Cooling System Design		
	621	LN2-LHe Supply Systems	No MIE Scope	
	622	LN2 Coil Cooling Supply System	No MIE Scope	
	623	GN2 Cryostat Cooling System	No MIE Scope	
63	Utility Systems		Dudek	Dudek
	6301	Utility Systems		
64	Vacuum Vessel Heating and Cooling		Kalish	
65	Facility Systems Integration			
	6163	Facility Systems Support FY04	Complete	
	6501	Facility Systems Integration	Complete	

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WBS	Description			Job Manager	RLM
7	Test Cell Preparation and Machine Assembly			Perry	Dudek
71	Shield Wall Reconfiguration				
	7101	Shield Wall Modifications	Complete		
72	Control Room Refurbishment		No MIE Scope		
73	Platform Design and Fabrication				
	7301	Platform Design & Fabrication			
74	Machine Assembly Planning and Oversight				
	7401	TC Prep & Mach Assy Planning			
75	Test Cell and Basement Assembly Operations				
	7503	Machine Assembly Operations			
	7501	Construction Support Crew			
76	Tooling Design and Fabrication				
	7601	Tooling Design & Fabrication			
77	Measurement Systems		No MIE Scope		
8	Project Management & Integration				
81	Project Management and Integration			Rej	Rej
	8101	Project Management & Control		Rej	Rej
	8102	Project Management ORNL		Harris	Rej
82	Project Engineering				
821	Engineering Management				
	8202	Eng. Mgt. & System Eng. Support		Heitzenroeder	Heitzenroeder
	8206	FY07 Re-baseline Tasks	Complete		
822	System Engineering			Heitzenroeder	Heitzenroeder
823	Design Integration			Brown	Heitzenroeder
	8203	Design Integration			
824	System Analysis and Technical Assurance			Brooks	Heitzenroeder
	8204	Systems Analysis			
825	Dimensional Control Coordination			Ellis	Heitzenroeder
	8205	Dimensional Control Coordination			
826	Plant Design			Perry	Heitzenroeder
	8215	Plant Design			
83	Environmental and Safety/QA Management		No MIE Scope		
84	Project Physics				
	8401	Project Physics	Complete		
	8402	Project Physics ORNL	Complete		
85	Integrated Systems Testing			Gentile	vonHalle
	8501	Integrated Systems Testing			
89	PPPL Allocations			Strykowski	Rej
	8998	PPPL Allocations			