Key: X = Before First Plasma Y= After First Plasma
X(a)=Before First Plasma for Part a of the requirement

Quality Conformance Matrix		Examination	Test	Demonstration	Analysis	Not Applicable	Remarks
3.2.1	Performance Characteristics						
3.2.1.1	Initial Facility Startup			X			
3.2.1.2	Pre-Run Facility Startup			X			
3.2.1.2.1	Coil Cool-down						
3.2.1.2.1.1	Coil Cool-down Timeline			X			First few cooldowns should be closely monitored to assure that temperatures are tracking expected values and that no unanticipated thermal stresses are being imposed. Ultimate demonstration after First Plasma.
3.2.1.2.1.2	Cool-down and Warm-up Cycles				X		
3.2.1.2.1.3	Pre-Run Temperatures			X			
3.2.1.2.2	Vacuum Requirements						
3.2.1.2.2.1	Base Pressure	X(b)	X(a)	Y(a)			Historically, it takes time to initially eliminate all vacuum leaks and to condition the vacuum vessel adequately for UHV conditions. The VVSA shall be tested during the assembly process (prior to First Plasma) to assure that the VVSA is sufficently leak-tight to support achieving the ultimate base pressure and leak rate requirements. Demonstration of achieving the ultimate requirements will take place after First Plasma.
3.2.1.2.2.2	Pumping Speed		X(b)		X(a)		
3.2.1.2.3	Bakeout						
3.2.1.2.3.1	Vacuum Vessel Bakeout Temperatures			X			.
3.2.1.2.3.2	Carbon-based Plasma Facing Components (PFCs) Bakeout Temperatures			Y	X		Upgrade requirement
3.2.1.2.3.3	Coil Temperatures During Bakeout			X			
3.2.1.2.3.4	Bakeout Timelines		X	Y			First few bakeouts (prior to First Plasma) should be closely monitored to assure that temperatures are tracking expected values and that no unanticipated thermal stresses are being imposed. Ultimate demonstration after First Plasma.
3.2.1.2.3.5	Glow Discharge Cleaning (GDC) During Bakeout			Y	X		Upgrade requirement
3.2.1.2.3.6	Bakeout Cycles				X		
3.2.1.3	Pre-operational Initialization and Verification			X			
3.2.1.3.1	Plasma Chamber Conditioning						
3.2.1.3.1.1	Boronization				X		Upgrade requirement
3.2.1.3.1.2	Lithiumization				X		Upgrade requirement
3.2.1.4	Pre-pulse Initialization and Verification			X			
3.2.1.4.1	Glow Discharge Cleaning (GDC) Between Pulses				X		Upgrade requirement
3.2.1.4.2	Pre-Pulse Temperature			X(d)	X(a) Y(b) Y(c)		
3.2.1.5	Experimental Operations						
3.2.1.5.1	Field Error Requirements	X(a)	X(b)	Y(b)			Part b addressed in component testing prior to First Plasma to ensure that individual elements would not compromise the requirement. Part b demonstrated after First Plasma, when power supplies for the field error correction coils are available.
3.2.1.5.2	Electrical (Eddy Current) Requirements		X(b)		X(a) X(c) X(d) X(e) X(f)		
3.2.1.5.3	Plasma Magnetic Field Requirements						
3.2.1.5.3.1	Coordinate System					X	
3.2.1.5.3.2	Magnetic Field Polarity	X(b)		X(a)			
3.2.1.5.3.3	Reference Scenarios						

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Quality Conformance Matrix		Examination	Test	Demonstration	Analysis	Not Applicable	Remarks
3.2.1.5.3.3.1	Reference Scenario Specifications						
3.2.1.5.3.3.1.1	First Plasma Scenario					X	
3.2.1.5.3.3.1.2	Field Line Mapping Scenario					X	
3.2.1.5.3.3.1.3	1.7T Ohmic Scenario					X	
3.2.1.5.3.3.1.4	1.7T High Beta Scenario					X	
3.2.1.5.3.3.1.5	1.2T High Beta Long-Pulse Scenario					X	
3.2.1.5.3.3.1.6	2T High Beta Scenario					X	
3.2.1.5.3.3.1.7	320 kA Ohmic Scenario					X	
3.2.1.5.3.3.2	Reference Scenario Requirements		X				Part a - All coil systems should be tested to the lesser of their full ratings and their power supply capability prior to First Plasma. (The PEP has less stringent requirements.) Deflections and temperatures should be monitored to assure that critical components were behaving as expected. Part b- Electrical power (including real time control) and cryogenic systems should be tested prior to First Plasma to show that those systems were operating at their rated capacity which would meet the requirements of the First Plasma and Field LIne Mapping Scenarios. Field Line Mapping and First Plasma would demonstrate that the integrated requirements for the Field Line Mapping and First Plasma Scenarios were met. Demonstrations for other scenarios would occur in later phases of operation.
3.2.1.5.3.4	Flexibility Requirements						
3.2.1.5.3.4.1	Quasi-axisymmetry Flexibility				X		
3.2.1.5.3.4.2	External Iota Flexibility				X		
3.2.1.5.3.4.3	Shear Flexibility				X		
3.2.1.5.3.4.4	Beta Limit Flexibility				X		
3.2.1.5.3.4.5	Radial and Vertical Position Flexibility				X		
3.2.1.5.3.5	Equilibrium Control				X		
3.2.1.5.3.6	Breakdown Loop Voltage				X		
3.2.1.5.3.7	Power Supply Ripple				X		
3.2.1.5.3.8	Coil Current Measurements			X			
3.2.1.5.4	Power Handling						
3.2.1.5.4.1	PFC Configuration				X		
3.2.1.5.4.2	Maximum Plasma Heating Power				X		
3.2.1.5.4.3	Maximum Component Surface Temperature				X		
3.2.1.5.5	Disruption Handling				X		
3.2.1.5.6	Plasma Heating						
3.2.1.5.6.1	Neutral Beam Heating						
3.2.1.5.6.1.1	Initial Neutral Beam Heating Complement	X	X				The following inspections and tests will be performed prior to First Plasma: - The beamline shall be mechanically installed on NCSX. - All cabling and other connections shall be installed. - Beamline operating vacuum shall have been achieved. - Beamline cryopanels shall be leak-checked. - Power system refurbishment will be complete. - A source shall be leak-checked. - Control systems shall be installed sufficient to begin subsystem testing.
3.2.1.5.6.1.2	Ultimate Neutral Beam Heating Complement				X		
3.2.1.5.6.2	Ion Cyclotron Heating (ICH)				X		
3.2.1.5.6.3	Electron Cyclotron Heating (ECH)				X		
3.2.1.5.7	Plasma Fueling						
3.2.1.5.7.1	Fuel Species			X			
3.2.1.5.7.2	Gas Injection			X(a) X(b)	X(c)		

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Quality Conformance Matrix		Examination	Test	Demonstration	Analysis	Not Applicable	Remarks
3.2.1.5.7.3	Pellet Injection	X(a)			X(b)		Part b is a future upgrade
3.2.1.5.8	Plasma Diagnostics						
3.2.1.5.8.1	General Diagnostics Requirements					X	
3.2.1.5.8.2	Diagnostics Implementation	X(a)			X(b)		Part b includes future upgrades
3.2.1.5.9	Instrumentation, Control, and Data Acquisition			X			The following integrated tests are specified in the PEP: Integrated test of the safety interlock system. Integrated test of the timing and synchronization system. Integrated test of the power supply real time control system. Integrated test of the data acquisition system.
3.2.1.5.10	Pulse Repetition Rate			X			
3.2.1.5.11	Discharge Termination						
3.2.1.5.11.1	Normal Termination			X			
3.2.1.5.11.2	Abnormal Termination			X			
3.2.1.6	Facility Shutdown			X			
3.2.1.6.1	Coil Warm-up Timeline		X	Y			First few warmups should be closely monitored to assure that temperatures are tracking expected values and that no unanticipated thermal stresses are being imposed. Ultimate demonstration after First Plasma.
3.2.1.6.2	Vacuum Vessel Venting			X			