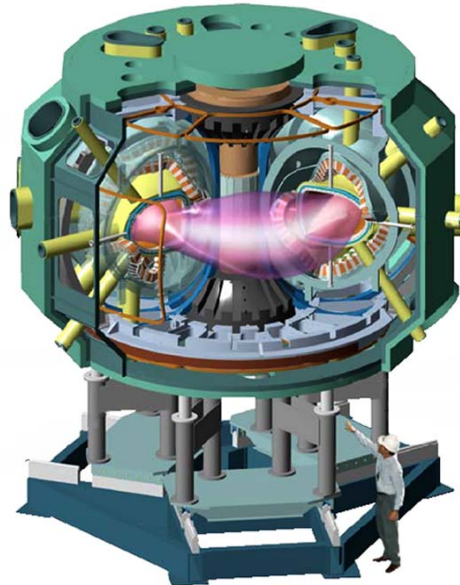


NCSX Project Milestone Directory

Revision 1

January 27, 2004



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NCSX Project Milestone Dictionary

Record of Revisions

Revision	Date	Description of Changes
0	December 15, 2003	Initial Issue.
1	January 27, 2004	Updated to reflect CD-2 DOE Milestone list.

NCSX Project Milestone Dictionary

Milestone	Approval Level Acquisition Executive (AE) or Federal Project Director (FPD)	Definition of Milestone	Criteria for Completion
Complete Physics Validation Review	FPD	Fusion community review and acceptance of the NCSX proposed mission and preliminary general requirements	Debriefing of the Physics Validation Review team
Complete CD-0 Milestone	AE	OFES approval of NCSX mission and preliminary general requirements	Document signed by Acquisition Executive confirming mission and authority to proceed with Conceptual Design Phase
Select Conceptual Design Configuration	FPD	The reference modular coil geometry was adopted as the basis for proceeding with Conceptual Design	Documentation to DOE Federal Project Director indicating configuration design configuration selected
Submit NEPA Preliminary Hazards Analyses	FPD	Initial assessment of PPPL that the proposed NCSX will not pose any undue risk to the public or environment	Document signed by NCSX ES&H Manager to DOE Federal Project Manager submitting NEPA Preliminary Hazards Analyses
Complete Conceptual Design Review	FPD	Fusion community review and acceptance of the proposed conceptual design, including the cost and schedule, that provides a basis for proceeding into more detailed design	Debriefing of the Conceptual Design Review team
Receive FONSI	FPD	DOE acceptance that the NCSX will not pose any undue risk to the public or environment	Document signed by DOE Federal Project Director forwarding FONSI
Complete CD-1 Milestone	AE	OFES approval of the preliminary baseline cost and schedule range. Provides the authority to proceed into Preliminary Design, subject to Congressional appropriations.	Document signed by Acquisition Executive approving CD-1 Milestone for start of MIE Project, subject to release of FY2003 Continuing Resolution
Award Prototype Contracts for Modular Coils Winding (MCC) Forms	FPD	Initiation of in-depth manufacturing studies by two suppliers. The purpose of this R&D is to work out the details of the manufacturing processes, refine cost and schedule estimates, and qualification of industrial suppliers for manufacturing the production articles.	PPPL Procurement formal award of the two Modular Coils Winding Form prototype contracts

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Milestone	Approval Level Acquisition Executive (AE) or Federal Project Director (FPD)	Definition of Milestone	Criteria for Completion
Award Prototype Contracts for Vacuum Vessel	FPD	Initiation of in-depth manufacturing studies by two suppliers. The purpose of this R&D is to work out the details of the manufacturing processes, refine cost and schedule estimates, and qualification of industrial suppliers for manufacturing the production articles.	PPPL Procurement formal award of the two Vacuum Vessel segment prototype contracts
Start Preliminary Design (Title I)	FPD	Preparation of preliminary design deliverables (e.g., design-to specifications, drawings, interface documents, etc.) will begin.	Notification from DOE Federal Project Director that the FY2003 Continuing Resolution is cancelled and that the Project is authorized to proceed with start of the MIE Project
Complete Project Preliminary Design Review	FPD	Preliminary design represents the phase of the design where the requirements are defined and shown to be achievable, and where the cost and schedule for fabricating these components can be estimated more accurately. This results of this review will feed into the DOE Performance Baseline Review (PBR) and External Independent Review (EIR) as part of the CD-2 prerequisites.	Debriefing of the Preliminary Design Review team
Complete Combined External Independent Review and DOE Performance Baseline Review	FPD	These two reviews provide outside assessments of the readiness of the Project's readiness to proceed to establishing the Performance Baselines (technical, cost, and schedule). These are prerequisites for CD-2.	Complete debriefing of the DOE Performance Baseline Review (PBR) and the External Independent Review (EIR).
Authorize Prototype Fabrication of MCC and Vacuum Vessel	FPD	Upon receipt of necessary design documentation (e.g. MIE plan, etc.) prototype vendors demonstrating their capability to proceed with fabrication activities, PPPL will authorize the vendors to proceed with fabrication.	PPPL Procurement notice to suppliers that they may proceed with the fabrication of the MCC and VV prototypes.

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Complete CD-2 Milestones	AE	The Project performance baselines (technical, cost, and schedule) are officially established and under configuration control.	Document signed by Acquisition Executive approving CD-2 Milestone establishing Project Baseline.
Initiate Modular Coils Winding Process on a 3D Surface	FPD	Start winding on a segment of a twisted coil surface sample. This is an important step in the coil winding process development, the first experience winding the conductor on a winding form with representative cooling hardware, cross section, bends, and twists.	Initiate winding on a complex 3D surface, e.g., the segment of a twisted coil surface.
Produce First Prototype Modular Coil Winding Form Casting for Machining	FPD	Each supplier produces the first prototype MC winding form, ready for machining at the supplier's facility.	PPPL confirms that the first MCC winding form casting has been satisfactorily produced and is ready for machining at the supplier's facility.
Complete Final Design Review for the Modular Coils	FPD	Final design is the step in which the design is developed to the point where the specifications for a component can be given to a manufacturer to build. This review confirms that fabrication of the production MCC winding forms and conductor can proceed. This review will provide OFES the basis for approving start of fabrication activities, CD-3.	Debriefing of the MCC Final Design Review team.
Complete Final Design Review for the Vacuum Vessel	FPD	Final design is the step in which the design is developed to the point where the specifications for a component can be given to a manufacturer to build. This review confirms that fabrication of the production vacuum vessel can proceed. This review will provide OFES the basis for approving start of fabrication activities, CD-3.	Debriefing of the VV Final Design Review team.
Complete Prerequisites for the CD-3 Milestone for Procurement and Fabrication of Components	FPD	Project has completed all the prerequisites for proceeding to CD-3 decision as per DOE guidelines, including updating of necessary project documentation and completion of Lehman Review.	Complete Lehman Review and notify Federal Project Director that the Project is prepared to proceed to CD-3 milestone.

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Award Conductor Contract	FPD	This milestone provides the target date to specify the production conductor, choose the supplier(s), and award the contracts to conductor for the coils.	PPPL Procurement formal award of the Conductor production contract(s).
Complete CD-3 Milestone	AE	This milestone provides authority to the Project to proceed with the award of production contracts and to commence project construction activities.	Document signed by Acquisition Executive approving CD-3 Milestone authorizing start of construction and procurement and fabrication.
Award Production Contract for Modular Coils Winding Forms	FPD	This milestone provides the target date to specify the production unit modular coil winding forms, choose the supplier(s), and award the contracts to build the modular coil winding forms.	PPPL Procurement formal award of the Modular Coils Winding Forms production contract(s).
Award Production Contract for Vacuum Vessel	FPD	This milestone provides the target date to specify the production unit vacuum vessel, choose the supplier(s), and award the contracts to build the vacuum vessel.	PPPL Procurement formal award of the Vacuum Vessel production contract(s).
First Modular Coil Winding Forms Delivered	FPD	This milestone signifies the start of the on-site assembly process of the field periods. The first of 18 machined MCC winding forms is delivered to PPPL for winding of the copper conductor.	Receipt of first production modular coil winding form casting at PPPL.
Award Production Contract for the TF Coils	FPD	Following FDR of TF coils, the TF systems production contracts will be awarded.	PPPL Procurement formal award of the TF Coils production contract(s).
Complete First Modular Coil Fabrication	FPD	The first of 18 modular coils is wound with copper conductor, vacuum impregnated with epoxy, and tested. It is ready for assembly in the first field period.	PPPL complete winding of first modular coil segment.

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Award Production Contract(s) for PF Coils	FPD	Following FDR of PF coils, the PF systems production contracts will be awarded.	PPPL Procurement formal award of the PF production contract(s)
Vacuum Vessel Delivered	FPD	This will complete the vacuum vessel production order.	Receipt of vacuum vessel segments at PPPL.
Last Modular Coil Winding Form Delivered	FPD	This will complete the MC winding form production order.	Receipt of last modular coil machined winding form casting at PPPL.
Begin Assembly of First Field Period	FPD	The first field period assembly will be comprised of a 120° vacuum vessel segment, 6 modular coils and 6 TF coils along with diagnostic port extensions. Once pre-assembled, the three field periods will be joined to form the stellarator core.	PPPL commence assembly of first field period assembly in the NCSX test cell.
Complete Delivery of TF Coils	FPD	This will complete the TF coil production order.	Receipt of final TF coils at PPPL.
Last Field Period Assembled	FPD	This final field period will be assembled and then PPPL will be ready to commence joining the three field periods to form the stellarator core.	PPPL completes assembly of final field period.
Pump Down of Vacuum Vessel	FPD	Completion of this milestone signifies that the three field periods are properly joined.	PPPL complete pump down of vacuum vessel.
Complete Operational Readiness Assessment	FPD	Completion of the ORA and subsequent issuance of the Safety Certificate signifies that the NCSX device is ready for final integrated tests before proceeding to first plasma.	PPPL ES&H Executive Safety Board issue Safety Certificate to commence integrated system tests
Begin Start-Up Testing	FPD	This milestone signals the beginning of start-up testing.	Following receipt of Safety Certificate and approval of the NCSX Project Manager, start-up testing will begin.
Begin Cryostat Installation	FPD	This milestone signifies start of the installation of the remainder of the cryostat.	Start of final cryostat installation activities.
Complete CD-4 Milestone (First Plasma and Completion of MIE Project)	AE	This milestone authorizes the Project to proceed to first plasma. Once first plasma is achieved, the MIE Project will be considered complete.	Document signed by Acquisition Executive approving CD-4 Milestone authorizing start of operations and completion of the MIE Project