

NCSX Project Overview

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**SC Project Review
DOE Office of Science, Germantown, MD
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Contains Procurement Sensitive Information

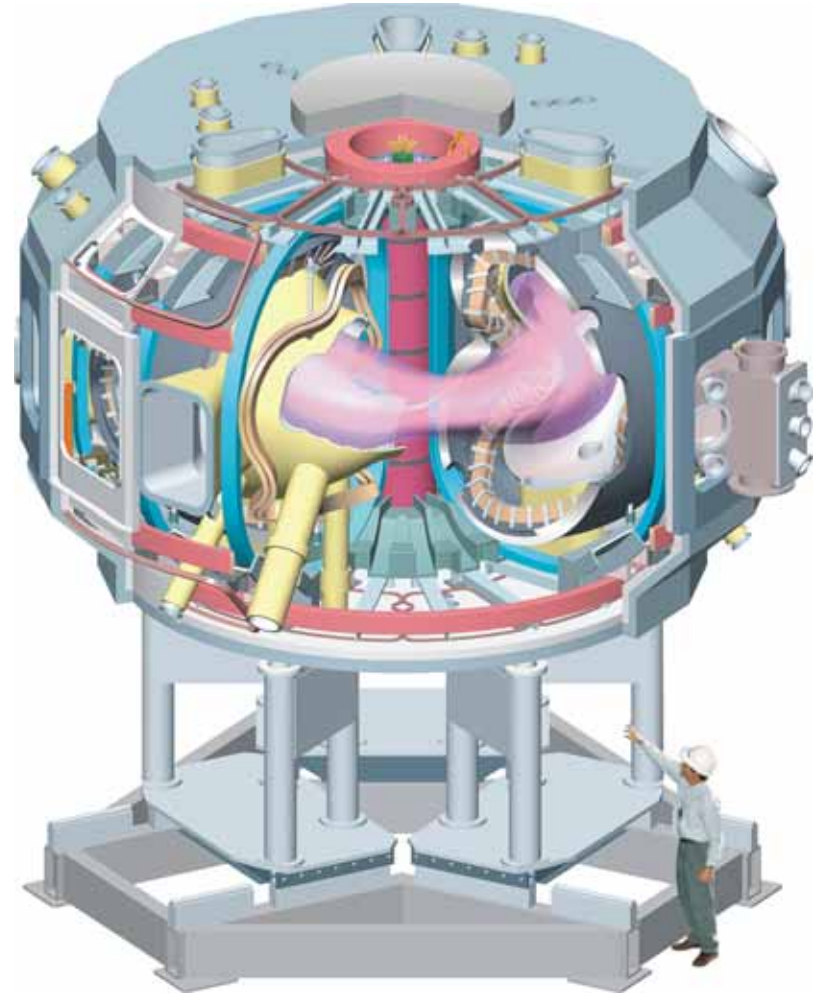
Outline



- Overview of progress and FY05 plans.
- Management changes and actions.
- Cost and schedule overview.
- Update on issues from recent SC reviews.

In-depth presentations to follow:

- Major procurements— P. Heitzenroeder.
- Engineering activities and updated risk assessment— W. Reiersen
- Cost and schedule— R. Strykowski



***NCSX Fabrication activities are off to a good start.
Project's finances have improved since the last SC review.***

The Key Fabrication Contracts Are in Place



Awards were made soon after CD-3.

- Vacuum Vessel Sub-Assembly (VVSA) to Major Tool & Machine, 9/23.
- Modular Coil Winding Forms (MCWF) to Energy Industries of Ohio, 10/6.
- Modular Coil Conductor to New England Wire Technologies, 9/30.

VVSA and MCWF contract prices and schedules conform to agreements negotiated in August and reported at Sept. SC Review.

The Contract Work is Off to a Good Start



VVSA (Major Tool & Machine)

- Vessel material (inconel) has been ordered.
- Good progress on engineering: mfg. & QA plans, process specs.
- Submitted schedule forecasts final delivery by Nov., 2004.
 - Material delivery uncertainties are a source of risk.

Contract is proceeding well, supports project schedule.

MCWF (Energy Industries of Ohio)

- First casting pattern (of 3) to be shipped to foundry Dec. 7. Pour by 12/21.
- Current plans provide improved delivery sequence: C-C-A-C-B-....
- Forecast on-schedule delivery of first (5/15/05) and last (9/15/06) MCWF.
 - Supports project schedule.

EIO and subs are managing technical and schedule challenges well.

FY-05 Work Plans Focus on High-Risk Scope



Modular Coil Windings

- Winding facility is now in operation! Twisted Racetrack R&D coil being fabricated to optimize manufacturing processes and dimensional control.
- FY-05 priority: preparations to start winding production coils in May.

Field Period Assembly

- Plans and estimates for all design and assembly jobs have been updated.
- Tooling details and procurement packages will be developed in FY-05.

Conventional Coils

- TF design was modified to reduce fabrication risks.
- We have identified additional vendors and plan an industry information meeting in January. RFP will be issued in February.

We Are Preparing to Wind the Modular Coils

NCSX



Vacuum Oven for Encapsulation

The Twisted Racetrack Coil

- Optimize processes and tooling.
- Assess dimensional control methods.
- Train staff.



Winding Fixture

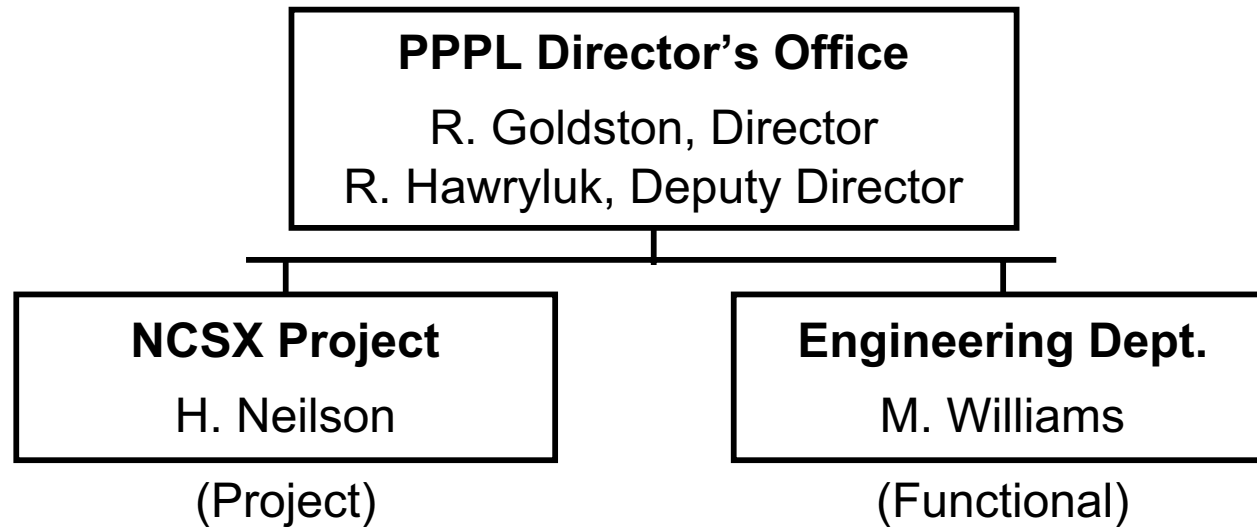
Available FY-05 BA is Adequate to Maintain Schedule and Manage Risks



Work Package	Budget (\$M)
VVSA procurement	3.7
MCWF procurement	4.6
Modular Coil Windings	3.8
Conventional Coils & Structures	1.2
Assembly	1.1
Stellarator Core, other	0.5
Ancillary Systems	0.8
Management & Integration	2.7
Total Work	18.6
Contingency available within project budget	1.2
Total Budget	19.8

- VVSA and MCWF procurements are adequately funded.
- Risk mitigation activities are adequately funded.

New PPPL Organization Strengthens NCSX Management



Engineering Dept. Head's responsibilities for NCSX have expanded.

- Senior management oversight of NCSX engineering activities.
- Supports NCSX Project in resource allocation, cost & schedule control.
 - NCSX Project Mgr. has responsibility for project performance.

NCSX now reports directly to the Director's Office

- Reflects Laboratory's commitment to success of NCSX.

We Have Increased Management Emphasis on Procurements and on Cost and Schedule



Project has changed from design- to fabrication-dominated activity. Changes in regular meeting cycle reflect the transition.

	Meeting Title (Frequency)	Chair / Attendees	Purpose	Changes highlighted
	NCSX Quarterly Review (Quarterly)	Assoc. Dir., FES, DOE-SC / Federal & Lab. Mgt.	Management oversight	
New!	Procurement Status (Weekly)	Federal Program Mgr. / IPT Members	Management oversight of procurement risks	
	Integrated Project Team (Monthly)	Federal Project Dir. / IPT Members	Strategic risk management	
	Deputy Director's Review (Weekly)	PPPL Deputy Director / NCSX Lab. Mgt. Team	Management oversight	
	System Integration Team (Weekly)	Project Mgr. / NCSX Lab. Mgt. Team	Risk management, with emphasis on procurements.	
	Earned-Value Status (Monthly)	Project Control Mgr. / All job managers	Cost & schedule control	
New!	Critical Activities Status (Weekly)	Project Engineering Mgr. / Critical-path job managers	Cost & schedule risk mgt. (emphasis on in-house jobs)	
	Stellarator Engineering (Weekly)	Stellarator Eng. Mgr. / Engineering Team	Technical decision-making	
	Daily Plan and Rollover (Daily & Weekly)	PPPL Shift Supervisor / All PPPL Projects	Coordination of all projects' engineering activities.	

NCSX IPT and Lab management team are staffed and functioning well.9

Recent Management Actions



Performed bottoms-up re-estimate of cost and schedule to complete.

- Updated risk assessments for all work packages.
- Re-planned to focus on CD-4 and maintain adequate contingencies.

Risk management—progress in critical issues resolution.

- Mitigation plans and status tracked using critical issues list.
- Risks used as focus for project planning and meetings.

Change control— Kept cost, schedule, and technical baselines up-to-date and self-consistent.

- 5 ECPs approved since last SC Review.

Safety

- Winding operations were reviewed by Lab Activity Certification Committee.
 - Follow-up on recommendations in progress. More reviews planned.
- NCSX staff began taking Lab's new Hazard Recognition training.

Actions Taken to Improve Contingency Position



In response to comments from the 9/1 review, we continued to review plans and eliminate work not required for CD-4. Changes, some of which were incorporated into the CD-3 baseline (9/16), include:

- Deleted 150 C He bakeout equipment (−\$460k)
 - Satisfy CD-4 needs by induction heating with the baseline power supplies.
- Deleted water cooling for deleted NBI and bakeout equipment. (−\$280k)
- Adopted retrofittable trim coil design; simplified baseline config. (−\$200k)
 - Experiments needed to clarify long-term needs— start with a basic system.
- Deleted costs for D-to-C-site DC transmission line. (−\$439K)
- Use I&C software developments from NSTX. (−\$274K)
- Simpler fueling system (−\$60K). Share visible camera with NSTX (−\$50K)
- Associated reductions in management & integration (−\$430K)

As a result, contingency drawdown since CD-3 has been modest.

Cost and Schedule Status Has Improved Since CD-3



	SC Review, 9/1/04	CD-3 Baseline, 9/16/04	This Review, 12/7/04	Comment
Status date	8/1/04		11/1/04	3 months elapsed
Cost Status:				
BCWP (\$M)	16.8		20.8	\$4M of work accomplished.
BCWR (\$M)	57.1		52.5	
Contingency (\$M)	12.4	13.4	13.0	
On VVSA & MCWF	1.3 (10%)	1.3 (10%)	1.3 (10%)	
On All Other	11.2 (25%)	12.2 (28%)	11.8 (30%)	Improved %-age
Cost variance (\$M)	-0.7		-0.1	Reduced negative CV
Schedule Status:				
Time remaining (mos.)	46		43	
Schedule conting. (mos.)	5		5	
Schedule variance (\$M)	-1.1		+0.2	Eliminated negative SV.

- Budget contingency has improved as a fraction of remaining work.
- Schedule contingency maintained.

Issues from Recent SC Reviews Are Being Resolved.

Recent Highlights



Financial position has improved.

- Actions taken to improve contingency, reduce variances.

Critical spares plan has been developed.

- Startup operations relies largely on already functioning infrastructure.
- Critical spares issues identified, plans documented.

All review recommendations are logged and tracked to closure. Updates posted for this review:

- SC Project Reviews (Sept., June)
- Site Final Design Review (May)

The NCSX Project is On Schedule & Performing Well



Fabrication activities are proceeding on budget and schedule.

- VVSA & MCWF procurements.
- Preparations for in-house coil winding and assembly activities.

Management has responded to the project's changing needs.

- Strengthened NCSX position in the PPPL organization.
- Actions taken to improve project's finances.
- Cost, schedule, and technical risks are being managed.
- The IPT and Laboratory project team are staffed and functioning well.

Cost and schedule status has improved.

- Completed bottoms-up updates of ETC and risk assessment.
- Budget contingency is improved, schedule contingency maintained.
- Contingencies are adequate to manage the remaining risks.