

NCSX Work Approval Form (WAF)

WBS Number: 85

WBS Title: Integrated Systems Testing

Job Number: 8501

Job Title: Integrated Systems Testing

Job Manager: Charlie Gentile

Description:

This WBS (85) covers the planning, document preparation, and execution of the NCSX integrated system testing and startup activities, culminating in First Plasma

Schedule:

See Attached

Approvals:

Job Manager

Date

Responsible Line Manager

Date

Project Manager

Date

Engineering Department Head

Date

NCSX June 2007 ETC
TABLE I - Design Labor

WBS Number: 85
WBS Title: Integrated Systems Testing
Job Number: 8501
Job Title: Integrated Systems Testing
Job Manager: Charlie Gentile

Task ID	TASK DESCRIPTION	FY07\$K																		
		41 MS	48 MS	37 STK	35 TRVL	31 OT	EM EM	EM SM	EM SB	EM TB	EA EM	EA SB	EE EM	EE SM	EE SB	EE TB	EC EM	EC SB	EC TB	RM2
Documentation																				
	1.0 fte Engineer	28.5					1140													
	1.0 fte Senior L&S	28.5					1140													
Startup																				
	1.0 Test director/physicist in charge (PIC) @100%	10																		400
	1.0 Chief Operations Engineer (COE) @85%	10				340														
	1.0 Project Engineer (wayne already at 75% in w/	10							100											
	2.0 Machine technicians @ 85%	10						680												
	1.0 FCPC Tech @75%	10										300								
	1.0 Cryo sysw tech @75%	10							300											
	1.0 AC power Engr @75%	10										300								
	1.0 Computer Engr @75%	10														300				
31							1480	1140	680	300	100	0	300	300	0	0	300	0	0	400

Basis of Estimate
These estimates are based on a CD-4 Startup Plan (dated April 2007) - The purpose of this Startup Plan is to identify those tasks, documents, actions, and reviews required for meeting the requirements of Critical Decision 4 (CD-4), NCSX First Plasma.

Based on TFTR & NSTX experience & existing S/U documentation
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NCSX June 2007 ETC
TABLE I - Materials and Subcontracts

WBS Number: 85											
WBS Title: Integrated Systems Testing											
Job Number: 8501											
Job Title: Integrated Systems Testing											
Job Manager: Charlie Gentile											
Description:											
None - all labor.											

NCSX June 2007 ETC
TABLE III - Fabrication and Assembly

WBS Number: 85										
WBS Title: Integrated Systems Testing										
Job Number: 8501										
Job Title: Integrated Systems Testing										
Job Manager: Charlie Gentile										
Fabrication and Assembly										

NCSX June 2007 ETC
TABLE IV - Uncertainty of Estimate and Residual Risk Assessment

WBS Number: 85
WBS Title: Integrated Systems Testing
Job Number: 8501
Job Title: Integrated Systems Testing
Job Manager: Charlie Gentile

Uncertainty of the Estimate

	<u>High</u>	<u>Medium</u>	<u>Low</u>	<u>Uncertainty Range (%)</u>	<u>Comments/Other Considerations</u>
Design Maturity	X			-5%/+10%	LOE effort dependent on length of schedule
Design Complexity			X		No special assignments

Note: High/Medium/Low uncertainty assessment from Job Manager. Uncertainty range based on ACEI recommended practice 18R-97 as amended for NCSX.

Residual Impacts

Job	Risk Description	Likelihood of Occurring	Mitigation Plan	Basis of estimate	Cost Impact		Schedule Impact	
					Low	High	Low	High
8501	Coils are hooked up with incorrect polarity	U	Tested during ISTP and fixed	Covered in estimate uncertainty with present mitigation plan				

Notes:

- [1] Low cost and schedule impacts are considered the minimum (0-percentile) impacts should the event occur.
 High cost and schedule impacts are considered the maximum (100-percentile) impacts should the event occur
- [2] Cost impacts should be entered as man-hours (by demographic) and M&S direct cost under basis of estimate.
 Cost impacts should NOT include standing army costs which are separately calculated from the schedule impact
 Project control is responsible for quantifying the low and high cost impacts based on the labor hours and M&S identified
- [3] The schedule impacts should be entered as the min and max impacts on the critical path.
 If there is no critical path impact then the schedule entries should be zero.
- [4] Likelihood of occurrence should be entered consistent with our risk classification methodology, i.e.
 VL= Very Likely (P>80%), L=Likely (80%>P>40%), U=Unlikley (40%>P>10%), VU=Very Unlikley (P<10%), NC=Non-credible (P<1%)

Activity ID	MILE-stones (level 2 & 3)	Activity Description	Duration (work days)	Baseline Start	Baseline Finish	Shifts	Total Float	% cmplt	Proposed Budgeted							
										FY07	FY08	FY09	FY10	FY11	FY12	
85 - Integrated Systems Testing																
Job: 8501 - Integrated Systems Testing-GENTILE																
Startup Documentation																
8501-105		ESHD-5008 Environ, Safety, and Health Manual	0	01MAY07A	01MAY07A				0.00	EM//EM =00hr ; EM//SM =00hr ;						
8501-109		ESH-014 NEPA Review System	0	01MAY07A	01MAY07A				0.00	EM//EM =00hr ; EM//SM =00hr ;						
8501-113		ESH-016 Cntrl Haz Energy Sources Lockout Tagout	0	01MAY07A	01MAY07A				0.00	EM//EM =00hr ; EM//SM =00hr ;						
8501-117		ENG-030 PPPL Tech Procd for Exper Facilities	0	01MAY07A	01MAY07A				0.00	EM//EM =00hr ; EM//SM =00hr ;						
8501-121		ENG-032 PPPL Work Planning Procedure	0	01MAY07A	01MAY07A				0.00	EM//EM =00hr ; EM//SM =00hr ;						
8501-125		ENG-033 PPPL Engineering Design Verification	0	01MAY07A	01MAY07A				0.00	EM//EM =00hr ; EM//SM =00hr ;						
8501-101		SAD NCSX Safety Assessment Document (SAD)	45	03NOV08*	15JAN09			185	48,236.80	EM//EM =160hr ; EM//SM =160hr ;						
8501-129		NCSX-XX, Administrative Control of Procedures	30	24NOV08	15JAN09			184	24,118.40	EM//EM =80hr ; EM//SM =80hr ;						
8501-133		OP-AD-39, Conduct of Operations	10	16JAN09	29JAN09			184	6,029.60	EM//EM =20hr ; EM//SM =20hr ;						
8501-137		OP-AD-56, Cntrl Equip & Syst Status (chain of c	10	23JAN09	05FEB09			184	6,029.60	EM//EM =20hr ; EM//SM =20hr ;						
8501-141		OP-AD-24, Cntrl Workplace Cleanliness D-Site Exp	10	30JAN09	12FEB09			184	6,029.60	EM//EM =20hr ; EM//SM =20hr ;						
8501-145		OP-AD-31, D- Site Fire Watch Requirements	10	06FEB09	19FEB09			184	6,029.60	EM//EM =20hr ; EM//SM =20hr ;						
8501-149		OP-AD-03, Experimental Proposals for NCSX	10	13FEB09	26FEB09			184	6,029.60	EM//EM =20hr ; EM//SM =20hr ;						
8501-153		OP-AD-117 Operation of the NCSX Access System	10	20FEB09	05MAR09			184	6,029.60	EM//EM =20hr ; EM//SM =20hr ;						
8501-157		NCSX-OP-XX, Prep of Exper Areas for Machine Ops	30	27FEB09	09APR09			184	18,088.80	EM//EM =60hr ; EM//SM =60hr ;						
8501-161		NCSX-OP-XX, Operation of the NCSX TVPS	30	20MAR09	30APR09			184	18,088.80	EM//EM =60hr ; EM//SM =60hr ;						
8501-165		NCSX-OP-XX, Testing NCSX HIS Safe for Access	30	10APR09	21MAY09			184	18,088.80	EM//EM =60hr ; EM//SM =60hr ;						
8501-169		NCSX-OP-XX, Testing the NCSX Emergency Stop Syst	30	01MAY09	12JUN09			184	18,088.80	EM//EM =60hr ; EM//SM =60hr ;						
8501-173		NCSX-OP-XX, NCSX Training Matrix	30	22MAY09	06JUL09			184	18,088.80	EM//EM =60hr ; EM//SM =60hr ;						
8501-177		NCSX-OP-XX, NCSX Ops Guide -Startup and Shutdown	30	15JUN09	27JUL09			184	18,088.80	EM//EM =60hr ; EM//SM =60hr ;						
8501-181		NCSX-OP-XX, HPP Daily Operations	20	14JUL09	10AUG09			184	12,059.20	EM//EM =40hr ; EM//SM =40hr ;						
8501-185		NCSX-OP-XX, ACP & PDP Trip Control Settings	20	28JUL09	24AUG09			184	12,059.20	EM//EM =40hr ; EM//SM =40hr ;						
8501-189		NCSX-OP-G-XX Preparation for NCSX pumpdown	30	11AUG09	22SEP09			184	18,088.80	EM//EM =60hr ; EM//SM =60hr ;						
8501-193		NCSX-OP-XX Helium H/C System Operations Procedur	30	01SEP09	13OCT09			184	18,273.30	EM//EM =60hr ; EM//SM =60hr ;						
8501-197		NCSX-OP-G-XX Daily Hi-Pot Test Vacuum Vessel	30	23SEP09	03NOV09			184	18,580.80	EM//EM =60hr ; EM//SM =60hr ;						
8501-201		ISTP-NCSX-01 Coil EnergizationTests	40	14OCT09	10DEC09			184	24,938.40	EM//EM =80hr ; EM//SM =80hr ;						
8501-205		OP-ECS-245 FCPC Daily Startup/Shutdown Procedure	20	25NOV09	05JAN10			184	12,469.20	EM//EM =40hr ; EM//SM =40hr ;						
8501-209		NCSX-XX Leak Checking of NCSX	20	11DEC09	19JAN10			184	12,469.20	EM//EM =40hr ; EM//SM =40hr ;						
Startup Personnel																
920.000		Startup Personnel	76	01OCT10	26JAN11	1	426		418,829.00	EM//EM =340hr ; EA//EM =100hr ; EM//SB =680 ; EM//TB =300hr ; EE//EM =300hr ; EE//SM =300hr ; EC//EM =300hr ; R//RM2 =400hr ;						
8501-102		Punch list & CSIS & HIS PTP's complete,	5	01OCT10*	07OCT10	1	5		0.00							
8501-103		PTP's complete for ECS,HCS,vac pmpg	5	08OCT10	14OCT10	1	5		0.00							
8501-104		ACC review and ORA	5	15OCT10	21OCT10	1	5		0.00							

Activity ID	MILEstones (level 2 & 3)	Activity Description	Duration (work days)	Baseline Start	Baseline Finish	Shifts	Total Float	% cmlpt	Proposed Budgeted						
										FY07	FY08	FY09	FY10	FY11	FY12
730.1250	2	PSO Operational Readiness Assessment	0		21OCT10	1	5		0.00						
8501-301		Configure for Startup ISTP	5	26OCT10	01NOV10	1	3		0.00						
8501-305	2	Coil Testing at room temp	5	05NOV10	11NOV10	1	0		0.00						
8501-106		Coil testing @ cryo temp, Pump-down VV	5	04JAN11	10JAN11	1	0		0.00						
8501-107		Combined field testing, Make 1st Plasma	5	11JAN11	17JAN11	1	0		0.00						
8501-108		Vent VV, Config for & instl e-beam mapping	5	18JAN11	24JAN11	1	0		0.00						
8501-306		E-beam mapping	5	25JAN11	31JAN11	1	0		0.00						
8501-110	1	NCSX Startup Complete	0		31JAN11	1	0		0.00						
730.9000	1	CD-4	0		23DEC11*	1	0		0.00						
Subtotal			0		23DEC11		194		764,832.70						

