NCSX Work Approval Form (WAF)

WBS Number: 74
WBS Title: Machine Assembly Planning & Oversight
Job Numbers: 7401 and 7451
Job Title: Machine Assembly Planning & Oversight (7401)
Job Title: ORNL Support of Redesigns (7451)
Job Manager: Erik Perry (7401) and Mike Cole (7451)

Description:

This WBS element includes those activities associated with planning the assembly and installation, of the NCSX device. It includes the Construction Management coordination between WBS elements whose activities directly involve the assembly of the NCSX components in the NCSX test cell and basement. It also includes participation in design reviews by the Construction Manager to assure the constructability of the NCSX facility.

Schedule:

See Attached

Approvals:

Erik Perry
Digitally signed by Erik Perry
DN: cn=Erik Perry, c=US, email=eperry@pppl.gov
Date: 2007.07.16 11:02:44 -04'00'

Job Manager _____ Date _____

M. J. Cole
Reason: Approved
Date: 2007.07.17 16:02:14 -04'00'

Job Manager _____ Date _____

Lawrence E. Dudek
Digitally signed by Lawrence E. Dudek
DN: cn=Lawrence E. Dudek, c=US
Date: 2007.07.16 11:55:58 -04'00'

Responsible Line Manager _____ Date _____

Hutch Neilson
Digitally signed by Hutch Neilson
DN: CN = Hutch Neilson, C = US, O = PPPL
Date: 2007.07.17 17:26:13 -04'00'

Project Manager _____ Date _____

Mike Williams
Digitally signed by Mike Williams
DN: cn=Mike Williams, o=PPPL, ou=Engineering Department, email=williams@pppl.gov, c=US
Date: 2007.07.17 18:08:59 -04'00'

Engineering Department Head _____ Date _____

NCSX June 2007 ETC
TABLE I - DESIGN LABOR

Description:

Title I and II Engineering for PF Coils and Title III Support of Fabrication Effort.

Task ID	FY07$K					HOURS																		Basis of Estimate
	41MS	48MS	37STK	35TRVL	31OT	ORNL EM	ORNL DSN	EMEM	EMSM	EMSB	EMTB	EAEM	EAEM Dsn	EASB	EEEM	EESM	EESB	EETB	ECEM	ECSB	ECTB	RM2	RM3	
None - this is an assembly operation																								

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TABLE II - Materials and Subcontracts

Materials and Subcontracts (M&S)					**Basis of Estimate**		
Description:							
None - this is an assembly operation							

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TABLE III - Fabrication/Assembly Installation

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In-house Fabrication and Assembly and Installation

Job 7401 - Machine Assembly Planning & Oversight

		K$	Hours						Duration in Shifts	Persons per Shift	Assumptions	Basis of Estimate
												The plan estimate is based on the time required for the preparation of the existing assembly plan. The LOE oversight is based on the actual costs for the NSTX assembly oversight and the TFTR D&D Project oversight.
Description of Task	**ACT**	**M&S**	**EAEM**	**Metrology**	**ORNL EM**	**EMEM**	**EMSM**	**EMTB**				
LOE FY07 prior to assembly starting	714.020					120	90					
Update Final Assembly Plar						160						Based on time to do existing plan
LOE during assembly (thru first plasma) 1.0 fte each EM and SM	714.030					1.0 fte	1.0 fte					LOE based on TFTR & NSTX Assembly. (1.0 fte only is required on 2nd shift if used)
~~Test Cell 110v outlets~~	~~7502-001~~						~~48~~				**GPP Funded**	
~~Test Cell 208v outlets~~	~~7502-002~~						~~24~~				**GPP Funded**	
Subtotal Job 7401		***$0.0K***	***0***	***0***		***280***	***162***	***0***				

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TABLE IV - Uncertainty of Estimate and Residual Risk Assessment

Uncertainty of the Estimate

		High	Medium	Low	Uncertainty Range	Comments/Other Considerations
Job 7401						
	Design Maturity			X		Linked with Job 7503 => Estimated without detailed drawings. Significant uncertainty that current concept will stay the same - see Residual Risks below.
					-20%/+40%	
	Design Complexity		X			Linked to Job 7503 => Experienced in assembly fusion devices, but tolerances exceed anything done before.
Job 7451						
	Design Maturity			X		Linked with Job 7503 => Estimated without detailed drawings. Significant uncertainty that current concept will stay the same - see Residual Risks below.
					-20%/+40%	
	Design Complexity		X			Linked to Job 7503 => Experienced in assembly fusion devices, but tolerances exceed anything done before.
	Other Comments:					This job is LOE - as WBS 75 increases in duration this job will increase in duration the same amount.

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

Residual Impacts

Job	Risk Description	Likelihood of Occurring	Mitigation Plan	Basis of estimate	Cost Impact Low	Cost Impact High	Schedule Impact Low	Schedule Impact High
7401	Loss or prolonged unavailability of certain key personnel (Viola or Perry) from the project could substantially impact the schedule.	VU	Viola and Perry will be cross-trained such that each could od the other's job	Estimated impact is <1 months on the critical path. Cost estimates cover 0-1 months of near term FPA assembly (in addition to the standing army costs addressed under schedule impact).	+$240K	+$480K	+1.00	+2.00

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 reponsible 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 Unlikely (P<10%), NC=Non-credible (P<1%)

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TABLE V - Basis of Estimate

WBS Number: 75
WBS Title: Machine Assembly Operations
Job Numbers: 7501 and 7503
Job Title: Construction Crew Support (7501)
Job Title: Machine Assembly Operations (7503)
Job Manager: Erik Perry

ORNL Updated Title III Engineering (6/8/2007)

Station No.	start date	end date	days	weeks		1st peri	2nd per	3thd period		ENGR	Designe	Total hrs
station 2	Oct-07	Mar-09	517.00	74	2954	591	394	197	1182	591	591	1182
station 3	Feb-08	Jul-09	516.00	74	2949	491	295	98	885	442	442	885
station 5	Apr-08	Sep-09	518.00	74	2960	493	296	99	888	444	444	888
station 6	Jun-09	Oct-10	487.00	70	2783	742	557	371	1670	1670	835	2505
			701	100	4006							

Total Hours	
Station 2 to 5 (FPA -	2954
Station 6 (Fnl Mach /	2505

Station 2		Coverage
1st period	60%	60% Engr/Dsn
2nd period	40%	40% Engr/Dsn
3thd period	20%	20% Engr/Dsn
ENGR	50%	Average
Designer	50%	Average

Title III Support Travel		
Job 1802	Job 7503	
$4,500		FY2007
$9,000		FY2008
$4,500	$1,500	FY2009
	$6,000	FY2010
	$4,500	FY2011

Assume each period is 1/3 of the number of weeks

Station 3		Coverage
0	50%	50% Engr/Dsn
590.8571	30%	30% Engr/Dsn
491.4286	10%	10% Engr/Dsn
ENGR	50%	Average
Designer	50%	Average

NCSX June 2007 ETC
TABLE V - Basis of Estimate

WBS Number: 75
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Job Numbers: 7501 and 7503
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Job Title: Machine Assembly Operations (7503)
Job Manager: Erik Perry

Station 5		Coverage
0	50%	50% Engr/Dsn
590.8571	30%	30% Engr/Dsn
491.4286	10%	10% Engr/Dsn
ENGR	50%	Average
Designer	50%	Average

Station 6		Coverage
0	80%	80% Engr/Dsn
590.8571	60%	60% Engr/Dsn
491.4286	40%	40% Engr/Dsn
ENGR	100%	Average
Designer	50%	Average