NCSX Work Approval Form (WAF)

WBS Number: 76
WBS Title: Tooling Design & Fabrication
Job Number: 7601
Job Title: Tooling Design & Fabrication
Job Manager: Erik Perry

Description:

This WBS element consists of the activities associated with the design and fabrication of tooling required to assemble the NCSX device. The work scope includes the design and fabrication of special fixtures and tooling which will be required during final assembly of the NCSX machine components in the C-site NCSX test cell. To the extent feasible, special tooling utilized in the pre-assembly of the field periods in the TFTR test cell will be utilized.

Schedule:

See Attached

Approvals:

Erik Perry — Digitally signed by Erik Perry
DN: cn=Erik Perry, c=US, email=eperry@pppl.gov
Date: 2007.07.18 14:33:07 -04'00'

Job Manager _____ Date _____

Lawrence E. Dudek — Digitally signed by Lawrence E. Dudek
DN: cn=Lawrence E. Dudek, c=US
Date: 2007.07.31 08:44:18 -04'00'

Responsible Line Manager _____ Date _____

James L Anderson — Digitally signed by James L Anderson
DN: cn=James L Anderson, c=US, o=PPPL, ou=NCSX, email=jlanders@pppl.gov
Reason: I am approving this document
Date: 2007.07.31 12:26:44 -04'00'

Project Manager _____ Date _____

Mike Williams — Digitally signed by Mike Williams
DN: cn=Mike Williams, o=PPPL, ou=Engineering, email=williams@pppl.gov, c=US
Date: 2007.07.31 12:30:02 -04'00'

Engineering Department Head _____ Date _____

NCSX June 2007 ETC
TABLE I - DESIGN LABOR

WBS Number: 76
WBS Title: Tooling Design & Fabrication
Job Number: 7601
Job Title: Tooling Design & Fabrication
Job Manager: Erik Perry

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																								

NCSX June 2007 ETC
TABLE II - Materials and Subcontracts

WBS Number: 76							
WBS Title: Tooling Design & Fabrication							
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			Weldments & Assy H/w				
Materials and Subcontracts (M&S)					**Basis of Estimate**		
Description:							
None - this is an assembly operation							

NCSX June 2007 ETC
TABLE III - Fabrication/Assembly Installation

WBS Number: 76
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In-house Fabrication and Assembly and Installation

Job 7601 - Tooling Design & Fabrication

		K$	Hours					Duration in Shifts	Persons per Shift	Assumptions	Basis of Estimate
Description of Task	ACT	M&S	EAEM	Metrology	EMEM	EMSM	EMTB				Estimates are based on similar assembly, installation for TFTR and NSTX
Lab Fab/Assy/Installation	713.020				80	42	140				
Tooling,assy fixtures,misc equipt	713.030	$60K									
General procurements	713.040	$45K									
Welding tools, materials & equipt	713.050	$80K									
Torque wrenches and multipliers		$80K			40						
Subtotal Job 7301		***$265K***	***0***	***0***	***120***	***42***	***140***				

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

WBS Number: 76
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Uncertainty of the Estimate

		High	Medium	Low	Uncertainty Range (%)	Comments/Other Considerations
	Design Maturity			X		Have extensive experience building and using special tooling for fabrication and decommissionir
					-15%/+25%	
	Design Complexity			X		Nothing exotic anticipated.

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

Residual Impacts

			Cost Impact		Schedule Impact	
Job	Risk Description	Likelihood of Occurring	Mitigation Plan	Basis of estimate	Low	High	Low	High
NONE								

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%

Activity ID	MILE-stones (level 2 & 3)	Activity Description	Duration (work days	Baseline Start	Baseline Finish	Shifts	Total Float	% cmplt	Proposed Budgeted
76 - Tooling Design & Fabrication									
Job: 7601 - Tooling Design & Fabrication-PERRY									
713.020		Lab Fab/Assy/Installation	348	26JAN09*	15JUN10		154		31,010.80
713.030		Tooling,assy fixtures,misc equipt	348	26JAN09*	15JUN10		154		84,863.97
713.040		General procurements	348	26JAN09*	15JUN10		154		63,647.97
713.050		Welding tools, materials & equipt	348	26JAN09*	15JUN10		154		113,151.95
713.060		Torque wrenches and multipliers	348	26JAN09*	15JUN10		154		119,883.90
Subtotal			348	26JAN09	15JUN10		154		412,558.59