

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:

Job Manager

Date

Responsible Line Manager

Date

Project Manager

Date

Engineering Department Head

Date

**NCSX June 2007 ETC
TABLE I - DESIGN LABOR**

WBS Number: 76																																													
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Job Number: 7601																																													
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Job Manager: Erik Perry																																													
Description:																																													
<i>Title I and II Engineering for PF Coils and Title III Support of Fabrication Effort.</i>																																													
				FY07\$K						HOURS																																			
Task ID		41MS							ORNL EIM																																				
								ORNL DSN																																					
								EMEM																																					
								EMSM																																					
								EMSB																																					
								EMTB																																					
								EAEM																																					
								EAEM Dsn																																					
								EASB																																					
								EEEM																																					
								EESM																																					
								EESB																																					
								EETB																																					
								ECEM																																					
								ECSB																																					
								ECTB																																					
								RM2																																					
								RM3																																					
												Basis of Estimate																																	
None - this is an assembly operation																																													

NCSX June 2007 ETC
TABLE II - Materials and Subcontracts

WBS Number: 76							
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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																				
WBS Title: Tooling Design & Fabrication																				
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In-house Fabrication and Assembly and Installation																				
Job 7601 - Tooling Design & Fabrication																			Basis of Estimate	
		K\$		Hours				Duration in Shifts	Persons per Shift	Assumptions	Estimates are based on similar assembly, installation for TFTR and NSTX									
Description of Task		ACT	M&S	EAEM	Metrology	EMEM	EMSM	EMTB												
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												

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TABLE IV - Uncertainty of Estimate and Residual Risk Assessment

WBS Number: 76												
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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		Have extensive experience building and using special tooling for fabrication and decommissioning					
	Design Complexity				X	-15%/+25%	Nothing exotic anticipated.					
Note: High/Medium/Low uncertainty assessment from Job Manager. Uncertainty range based on ACEI 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 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=Unlikely (40%>P>10%), VU=Very Unlikely (P<10%), NC=Non-credible (P<1%)											