

NCSX Fabrication Project Cost and Schedule Estimating Form

WBS 163 Coil Protection System

Labor

Activity Title	Manhours	FY2003 \$\$	Labor Type	Start Date Month/Yr	End Date Month/Yr	Comments
Preliminary Design (Title I)						
(50% of design schedule)	0		<i>EAEM</i>	Mar-06	May-06	PPPL Engineer
	0		<i>EADM</i>	Mar-06	May-06	PPPL Designer
	82		<i>ORNL Eng</i>	Mar-06	May-06	Composite of ORNL Engineer / Designer
	80		<i>ORNL Phys.</i>	Mar-06	May-06	Composite of ORNL Physics / scientific
	80		<i>PPPL Phys.</i>	Mar-06	May-06	PPPL Physics/scientific
Final Design (Title II)						
(50% of design schedule)	0		<i>EAEM</i>	May-06	Jun-06	PPPL Engineer
	0		<i>EADM</i>	May-06	Jun-06	PPPL Designer
	82		<i>ORNL Eng</i>	May-06	Jun-06	Composite of ORNL Engineer / Designer
	80		<i>ORNL Phys.</i>	May-06	Jun-06	Composite of ORNL Physicist
	80		<i>PPPL Phys.</i>	May-06	Jun-06	PPPL Physics/scientific
Lab R&D labor						
	0		<i>EAEM</i>	Mar-06	May-06	PPPL Engineer
	0		<i>EADM</i>	Mar-06	May-06	PPPL Designer
	0		<i>ORNL Eng</i>	Mar-06	May-06	Composite of ORNL Engineer / Designer
	0		<i>EASM</i>	Mar-06	May-06	PPPL monthly support
	0		<i>EMTB</i>	Mar-06	May-06	PPPL Technician
Lab Fab/Assembly/Installation (Title III)						
	0		<i>EAEM</i>	Jun-06	Nov-06	PPPL Engineer
	0		<i>EADM</i>	Jun-06	Nov-06	PPPL Designer
	0		<i>ORNL Eng</i>	Jun-06	Nov-06	Composite of ORNL Engineer / Designer
	0		<i>EASM</i>	Jun-06	Nov-06	PPPL monthly support
	0		<i>EMTB</i>	Jun-06	Nov-06	PPPL Technician

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Labor

Manhours per fiscal year by labor category

Level of Effort		FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	TOTAL
PPPL Engineer	<i>EAEM</i>	0	0	0	0	0	0	0
PPPL Designer	<i>EADM</i>	0	0	0	0	0	0	0
Composite of ORNL Engineer / Designer	<i>ORNL Eng</i>	0	0	0	164	0	0	164
PPPL monthly support	<i>EASM</i>	0	0	0	0	0	0	0
PPPL Technician	<i>EMTB</i>	0	0	0	0	0	0	0
Composite of ORNL Physics / scientific	<i>ORNL Phy</i>	0	0	0	160	0	0	160
PPPL Physics/scientific	<i>PPPL Phy</i>	0	0	0	160	0	0	160

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M&S Costs

Activity Title	FY2003 \$\$	Comment
Manufacturing Development (R&D)		
Purchased Design Services	\$0	
Procured Hardware/Material	\$0	
Profit at 10%	\$0	
<i>total, manf/dev (R&D)</i>	\$0	w/o G&A
Procured Hardware/Material		
0	\$0	
0	\$0	
0	\$0	
materials for in-house fab	\$0	
subtotal, purchased parts	\$0	
Profit at 10%	\$0	
<i>total, procured hdwe/matl.</i>	\$0	w/o G&A
Purchased Design Services	\$0	no purchased services anticipated
Procured Installation/Assembly Costs	\$0	All installation and assembly costs are included in WBS 7

Other Costs

Activity Title	FY2003 \$\$	Comment
Travel	\$0	No travel is anticipated for this WBS

Summary Costs

Activity Title	Manhours	FY2003 \$\$	Comment
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Labor

PPPL Effort	160	\$22,560
ORNL effort	324	\$46,920
subtotal, labor	484	\$69,480

<i>Assumed rates:</i>		<i>EASM</i> 100 \$/hr
<i>EAEM</i>	153 \$/hr	<i>EMTB</i> 73 \$/hr
<i>EADM</i>	100 \$/hr	PPPL Phys 141 \$/hr
<i>ORNL Eng</i>	130 \$/hr	ORNL Phys 160 \$/hr

M&S, Other

Manufacturing Development (R&D)		\$0
Procured Hardware/Material		\$0
Purchased Design Services		\$0
Procured Installation/Assembly Costs		\$0
Travel		\$0
subtotal, M&S		\$0

G&A

\$0

25% on all purchased materials, subcontracts, travel

Subtotal without contingency

\$69,480

Contingency

\$19,454

28% Overall on this WBS

Total cost

\$88,934

NCSX Fabrication Project Cost and Schedule

WBS 163 Coil Protection System

Engineering, Title I, II and III

Description:

This effort covers all Title I, II, and III engineering for the Coil Protection System. No hardware is anticipated for this job, only design interface with WBS 4 and 5.

	multiplier	unit	no.	hours	Labor category										
					fraction	EAEM		EADM		ORNL Eng		Physics		PPPL Physics	
						fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs
Title I, II design															
Pro-E models	8	hrs/model	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
assy dwgs	24	hrs/dwg	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
Detail drawings	16	hrs/dwg	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
installation dwg	16	hrs/dwg	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
cooling schematic	0	hrs/dwg	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
electrical schematic	8	hrs/dwg	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
I&C schematic	20	hrs/dwg	4	80	1.00	0.00	0	0.00	0	1.00	80	0.00	0	0.00	0
stress analysis	0	hrs/calc	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
thermal analysis	24	hrs/calc	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
special analysis	160	hrs/calc	2	320	1.00	0.00	0	0.00	0	0.00	0	0.50	160	0.50	160
procurement specifications	16	hrs/spec	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
preliminary and final design reviews	40	hrs/rev	1	40	1.00	0.00	0	0.00	0	1.00	40	0.00	0	0.00	0
meetings/reporting/presentations	10%	% of tot	440	44	1.00	0.00	0	0.00	0	1.00	44	0.00	0	0.00	0
<i>subtotal</i>				484			0		0		164		160		160
Title III															
					total fraction	EAEM		EASM		EADM		ORNL Eng			
						fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs		
vendor oversight, inspection	0	hrs/lot	1	0	1.00	0.00	0	0.00	0	0.00	0	1.00	0		
in-house fab/assy oversight and inspection	0	hrs/wk	4	0	1.00	0.00	0	1.00	0	0.00	0	0.00	0		
Disposition of deviation requests and non-conformances	0	hrs/wk	20	0	1.00	0.00	0	0.00	0	0.00	0	1.00	0		
As-built drawings	0	hrs/dwg	0	0	1.00	0.00	0	0.00	0	0.00	0	1.00	0		
Installation oversight and inspection	0	hrs/wk	4	0	1.00	0.25	0	0.75	0	0.00	0	0.00	0		
<i>subtotal</i>				0			0		0		0		0		

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WBS 163 Coil Protection System

Engineering, Title I, II and III

Schedule assumptions	start	duration (weeks)	end
Title I Design, R&D	Mar-06	6	May-06
Title II Design	May-06	6	Jun-06
Procurement	Jun-06	12	Sep-06
In-house fab / sub-assy	Sep-06	4	Oct-06
Installation / final assembly	Oct-06	4	Nov-06

Notes and worksheets

Pro-E models	
assy dwgs	
Detail drawings	
installation dwg	
cooling schematic	
electrical schematic	
I&C schematic	4 minimum of one schematic for each signal type
stress analysis	
thermal analysis	
special analysis	2 analysis of potential fault conditions based on reaction times of various systems specification of correct current, voltage, strain, and temperature waveforms to be compared with actual
procurement specifications	
preliminary and final design reviews	1
meetings/reporting/presentations	