

NCSX Fabrication Project Cost and Schedule Estimating Form

WBS 191 Stellarator Core Management and Oversight

Labor

Activity Title	Manhours	FY2002 \$\$	Labor Type	Start Date Month/Yr	End Date Month/Yr	Comments
Preliminary Design (Title I)						
(40% of design schedule)	0		<i>EAEM</i>	Apr-03	Mar-04	PPPL Engineer
	0		<i>EADM</i>	Apr-03	Mar-04	PPPL Designer
	0		<i>ORNL Eng</i>	Apr-03	Mar-04	Composite of ORNL Engineer / Designer
	0		<i>ORNL Phys.</i>	Apr-03	Mar-04	Composite of ORNL Physics / scientific
	0		<i>PPPL Phys.</i>	Apr-03	Mar-04	PPPL Physics/scientific
Final Design (Title II)						
(60% of design schedule)	0		<i>EAEM</i>	Mar-04	Aug-05	PPPL Engineer
	0		<i>EADM</i>	Mar-04	Aug-05	PPPL Designer
	0		<i>ORNL Eng</i>	Mar-04	Aug-05	Composite of ORNL Engineer / Designer
	0		<i>ORNL Phys.</i>	Mar-04	Aug-05	Composite of ORNL Physicist
	0		<i>PPPL Phys.</i>	Mar-04	Aug-05	PPPL Physics/scientific
Lab R&D labor						
	0		<i>EAEM</i>	Apr-03	Mar-04	PPPL Engineer
	0		<i>EADM</i>	Apr-03	Mar-04	PPPL Designer
	48		<i>ORNL Eng</i>	Apr-03	Mar-04	Composite of ORNL Engineer / Designer
	0		<i>EASM</i>	Apr-03	Mar-04	PPPL monthly support
	0		<i>EMTB</i>	Apr-03	Mar-04	PPPL Technician
Lab Fab/Assembly/Installation (Title III)						
	0		<i>EAEM</i>	Jul-04	Jun-07	PPPL Engineer
	0		<i>EADM</i>	Jul-04	Jun-07	PPPL Designer
	4423		<i>ORNL Eng</i>	Jul-04	Jun-07	Composite of ORNL Engineer / Designer
	0		<i>EASM</i>	Jul-04	Jun-07	PPPL monthly support
	0		<i>EMTB</i>	Jul-04	Jun-07	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>	26	395	1480	1480	1091	0	4471
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	0	0	0	0
PPPL Physics/scientific	<i>PPPL Phy</i>	0	0	0	0	0	0	0

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M&S Costs

Activity Title	FY2002 \$\$	Comment
Manufacturing Development (R&D)		
Purchased Design Services	\$0	
Procured Hardware/Material	\$0	
Profit	\$0	profit already included in these items
<i>total, manf/dev (R&D)</i>	\$0	w/o G&A
Procured Hardware/Material		
0	\$0	
0	\$0	
0	\$0	
0	\$0	
0	\$0	
0	\$0	
0	\$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	FY2002 \$\$	Comment
Travel	\$20,000	assumes one trip every 3 months

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Summary Costs

Activity Title	Manhours	FY2002 \$\$	Comment
Labor			
PPPL Effort	0	\$0	<i>Assumed rates:</i> <i>EAEM</i> 153 \$/hr <i>EADM</i> 100 \$/hr <i>ORNL Eng</i> 130 \$/hr <i>EASM</i> 100 \$/hr <i>EMTB</i> 73 \$/hr PPPL Phys 141 \$/hr ORNL Phys 160 \$/hr
ORNL effort	4,471	\$581,211	
subtotal, labor	4,471	\$581,211	
M&S, Other			
Manufacturing Development (R&D)		\$0	
Procured Hardware/Material		\$0	
Purchased Design Services		\$0	
Procured Installation/Assembly Costs		\$0	
Travel		\$20,000	
subtotal, M&S		\$20,000	
G&A		\$5,000	25% on all purchased materials, subcontracts, travel
Subtotal without contingency		\$606,211	
Contingency		\$60,621	10% Overall on this WBS
Total cost		\$666,833	

NCSX Fabrication Project Cost and Schedule

WBS 191 Stellarator Core Management and Oversight

Engineering, Title I, II and III

Description:

This effort covers general management and oversight for the Stellarator Core. It is assumed to be half time for the duration of the project.

Labor category

	multiplier	unit	no.	hours	total fraction	EAEM		EADM		ORNL Eng		ORNL Physics		PPPL Physics	
						fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs
Title I, II design															
Pro-E models (avg)	8	hrs/model	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
assy dwgs	40	hrs/dwg	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
Detail drawings	20	hrs/dwg	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
installation dwg	40	hrs/dwg	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
cooling schematic	20	hrs/dwg	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
electrical schematic	20	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	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
stress analysis	40	hrs/calc	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
thermal analysis	40	hrs/calc	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
special analysis (electromagnetics)	160	hrs/calc	0	0	1.00	0.00	0	0.00	0	0.00	0	1.00	0	0.00	0
procurement/fab specifications	160	hrs/spec	0	0	1.00	0.75	0	0.00	0	0.25	0	0.00	0	0.00	0
preliminary and final design reviews	80	hrs/rev	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
meetings/reporting/presentations	10%	% of tot	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
<i>subtotal</i>				0			0		0		0		0		0

	multiplier	unit	no.	hours	total fraction	EAEM		EASM		EADM		ORNL Eng	
						fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs
Title III													
Management and oversight	20	hrs/wk	221	4423	1.00	0.00	0	0.00	0	0.00	0	1.00	4423
Disposition of deviation requests and non-conformances	0	hrs/wk	186	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	91	0	1.00	0.00	0	0.00	0	0.00	0	1.00	0
<i>subtotal</i>				4423			0		0		0		4423

Schedule assumptions	start	duration (weeks)	end
Title I Design	Apr-03	48	Mar-04

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Engineering, Title I, II and III

Title II Design	Mar-04	74	Aug-05
Procurement	Jul-04	22	Dec-04
In-house fab / sub-assy	Jan-05	72	May-06
Installation / final assembly	Sep-05	91	Jun-07

Notes and worksheets

Core management and oversight

	total	
Pro-E models		0
assy dwgs		0
Detail drawings		0
installation dwg		0
cooling schematic		0
electrical schematic		0
I&C schematic		0
stress analysis		0
thermal analysis		0
special analysis		0
procurement specifications		0
preliminary and final design reviews		0
meetings/reporting/presentations		15%

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WBS 191 Stellarator Core Management and Oversight

In-house Fabrication and Assembly

Description:

There is no fabrication in this WBS element

Labor category

	multiplier	unit	no.	hours	total fraction	EAEM		EASM, EMSM		EMTB		EADM	
						fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs
Fab operations summary													
		hrs/lot	1	0	1.00	0.00	0	0.00	0	0.00	0	1.00	0
		hrs/line	1	0	1.00	1.00	0	0.00	0	0.00	0	0.00	0
		hrs / coil	18	0	1.00	1.00	0	0.00	0	0.00	0	0.00	0
<i>subtotal</i>				<i>0</i>			<i>0</i>		<i>0</i>		<i>0</i>		<i>0</i>

	multiplier	unit	no.	hours	total fraction	EAEM		EASM, EMSM		EMTB		EADM	
						fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs
Assembly operations summary													
		hr/lot	1	0	1.00	1.00	0	0.00	0	0.00	0	0.00	0
		hr/lot	1	0	1.00	1.00	0	0.00	0	0.00	0	0.00	0
		hr/coil	18	0	1.00	1.00	0	0.00	0	0.00	0	0.00	0
		hours	1	0	1.00	1.00	0	0.00	0	0.00	0	0.00	0
<i>subtotal</i>				<i>0</i>			<i>0</i>		<i>0</i>		<i>0</i>		<i>0</i>

Schedule assumptions	start	duration (weeks)	end
Title I Design, R&D	Aug-01	48	Jul-02
Title II Design	Jul-02	74	Dec-03
Procurement	Dec-03	22	May-04
In-house fab / sub-assy	May-04	72	Sep-05
Installation / final assembly	Sep-05	91	Jun-07

Notes and worksheets