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		EAEM	Apr-03	Mar-04	PPPL Engineer
	0		EADM	Apr-03	Mar-04	PPPL Designer
	0		ORNL Eng	Apr-03	Mar-04	Composite of ORNL Engineer / Designer
	0		ORNL Phys.	Apr-03	Mar-04	Composite of ORNL Physics / scientific
	0		PPPL Phys.	Apr-03	Mar-04	PPPL Physics/scientific
Final Design (Title II)						
(60% of design schedule)	0		EAEM	Mar-04	Aug-05	PPPL Engineer
,	0		EADM	Mar-04	Aug-05	PPPL Designer
	0		ORNL Eng	Mar-04	Aug-05	Composite of ORNL Engineer / Designer
	0		ORNL Phys.	Mar-04	Aug-05	Composite of ORNL Physicist
	0		PPPL Phys.	Mar-04	Aug-05	PPPL Physics/scientific
Lab R&D labor						
	0		EAEM	Apr-03	Mar-04	PPPL Engineer
	0		EADM	Apr-03	Mar-04	PPPL Designer
	48		ORNL Eng	Apr-03	Mar-04	Composite of ORNL Engineer / Designer
	0		EASM	Apr-03	Mar-04	PPPL monthly support
	0		EMTB	Apr-03	Mar-04	PPPL Technician
Lab Fab/Assembly/Installation (Title III)						
,	0		EAEM	Jul-04	Jun-07	PPPL Engineer
	0		EADM	Jul-04	Jun-07	PPPL Designer
	4423		ORNL Eng	Jul-04	Jun-07	Composite of ORNL Engineer / Designer
	0		EASM	Jul-04	Jun-07	PPPL monthly support
	0		EMTB	Jul-04	Jun-07	PPPL Technician

WBS 191 Stellarator Core Management and Oversight

Labor

Manhours per fiscal year by labor category

Level of Effort		FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	TOTAL
PPPL Engineer	EAEM	0	0	0	0	0	0	0
PPPL Designer	EADM	0	0	0	0	0	0	0
Composite of ORNL Engineer / Designer	ORNL Eng	26	395	1480	1480	1091	0	4471
PPPL monthly support	EASM	0	0	0	0	0	0	0
PPPL Technician	EMTB	0	0	0	0	0	0	0
Composite of ORNL Physics / scientific	ORNL Phy	0	0	0	0	0	0	0
PPPL Physics/scientific	PPPL Phy	0	0	0	0	0	0	0

WBS 191 Stellarator Core Management and Oversight

M&S Costs

Activity Title	FY2002 \$\$	Comment
Manufacturing Development (R&D)		
Purchased Design Services	\$0	
Procured Hardware/Material	\$0	
Profit	<u>\$0</u> \$0	profit already included in these items
total, manf/dev (R&D)	\$0	w/o G&A
Procured Hardware/Material		
0	\$0	
0	\$0	
0	\$0	
0	\$0	
0	\$0	
0	\$0	
subtotal, purchased parts	\$0	
Profit at 10%	<u>\$0</u> \$0	/a C 9 A
total, procured hdwe/matl.	\$ 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	

WBS 191 Stellarator Core Management and Oversight

Summary Costs

Activity Title	Manhours	FY2002 \$\$	Comment	
Labor				
PPPL Effort	0	\$0	Assumed rates:	<i>EASM</i> 100 \$/hr
ORNL effort	4,471	\$581,211	<i>EAEM</i> 153 \$/hr	EMTB 73 \$/hr
subtotal, labor	4,471	\$581,211	<i>EADM</i> 100 \$/hr	PPPL Phys 141 \$/hr
•	,	. ,	ORNL Eng 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		\$20,000		
subtotal, M&S		\$20,000		
G&A		\$5,000	25% on all purcha	ased materials, subcontracts, travel
Subtotal without contingency		\$606,211		
Contingency		\$60,621	10% Overall on th	nis 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.

Ιa	hor	cated	norv

					total					ODNII	_	ODNII 5		DDD1 5	. ·
	multiplier	unit		hours	fraction	EAI fract.		EAI fract.	אכ hrs	ORNL fract.	. ⊵ng hrs	ORNL F	nysics hrs	fract.	,
Title I, II design	multiplier	unit	no.	ilouis		iraci.	hrs	iraci.	IIIS	iraci.	IIIS	iraci.	1115	iraci.	hrs
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	Ö	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
subtotal				0			0		0		0		0		0
					total										
					fraction	EA	ΞM	EAS	SM	EAI	OM	ORNL	. Eng		
Title III						fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs		
Management and oversight Disposition of deviation requests and	20	hrs/wk	221	4423	1.00	0.00	0	0.00	0	0.00	0	1.00	4423		
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	0.00	0		0		
Installation oversight and inspection	0	hrs/wk	91	0	1.00	0.00	0	0.00	0	0.00	0	1.00	0		
subtotal				4423			0		0		0		4423		
castotal				, , 20			J		J		J				
Schedule assumptions Title I Design	start Apr-03	duration (weeks) 48	end Mar-04												

NCSX Fabrication Project Cost and Schedule

2

WBS 191 Stellarator Core Management and Oversight

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%

Date: August 28, 2003

WBS 191 Stellarator Core Management and Oversight

Description: There is no R&D in this WBS element

\$0 w/o G&A

\$0 w/o G&A

\$120 per hour \$60 per hour \$80 per hour

									Labor	catego	rv				
R&D design					total fraction	FA	FM	FAI	DM	ORNI	Fna	FAS	SM	Ven	dor
		unit	no.	hours	iraction	fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs
Task															
Pro-E models	12	hrs/model	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
assy dwgs	20	hrs/dwg	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
Detail drawings	8	hrs/dwg	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
installation dwg	0	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	0	hrs/dwg	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
I&C schematic	0	hrs/dwg	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
special analysis	0	hrs/calc	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
procurement specifications	40	hrs/spec	0	0	1.00	0.00	0	0.00	0	1.00	0	0.00	0	0.00	0
vendor shop drawings	0	hrs/dwg	0	0	1.00									1.00	0
vendor part programming	0	hrs/model	0	0	1.00									1.00	0
vendor misc engineering	0%	% of tot	0	0	1.00									1.00	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	20%	% of tot	40	8	1.00	0.00	0	0.00	0	1.00	8	0.00	0	0.00	0
subtotal				48			0		0		48		0		0
												EAS			
					total	EAB	EM	EAL	DM	ORNL	. Eng	EM:	SM	EM	TB
					fraction	fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs
R&D Tasks and Title III (see notes)															
		hrs	1	0	1.00	0.00	0	0.00	0	0.00	0		0	0.00	0
		hrs/setup	1	0	1.00	0.00	0	0.00	0	0.00	0	1.00	0	0.00	0
		hrs/setup	1	0	1.00	0.00	0	0.00	0	0.00	0	1.00	0	0.00	0
		hrs / coil	1	0	1.00	0.00	0	0.00	0	0.00	0	1.00	0	0.00	0
		hrs	1	0	1.00	0.00	0	0.00	0	0.00	0	1.00	0	0.00	0
subtotal				0			0		0		0		0		0

| duration | end | Nov-02 | 4 | Dec-02 | Dec-02 | 2 | Dec-02 | Dec-02 | Jan-03 | Jan-03 | 52 | Jan-04 | Schedule assumptions
R&D planning
Bid and award
R&D procurement / in-house fab.
R&D testing

Notes and worksheets

Engineering Design

Engineering Design
Pinz-Emodels
asso; ridges
asso; ridges
hard designings
installation dug
cooling schematic
electrical schematic
special analysis
special analysis
pecial analysis
contract
Tooling and flutures
Clean room
Cable conductor
ventor sing ordering
ventor misc engineering

Date: August 20, 2003

NCSX Fabrication Project Cost and Schedule

WBS 191 Stellarator Core Management and Oversight

In-house Fabrication and Assembly

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There is no fabrication in this WBS element

Labor category

					total fraction	EAE	ΞM	EASM,	EMSM	EM [*]	ТВ	EA	OM
	multiplier	unit	no.	hours		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
subtotal				0			0		0		0		0
					total								
					fraction	EAE	ΞM	EASM,	EMSM	EM	TB	EAD	OM
Assembly operations summary						fract.	hrs	fract.	hrs	fract.	hrs	fract.	hrs
		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
subtotal				0			0		0		0		0

		duration	
Schedule assumptions	start	(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

Date: August 20, 2003