

# **NCSX WBS-1**

- **Near Term Schedule**
- **Near Term Tasks and status**
- **Issues**

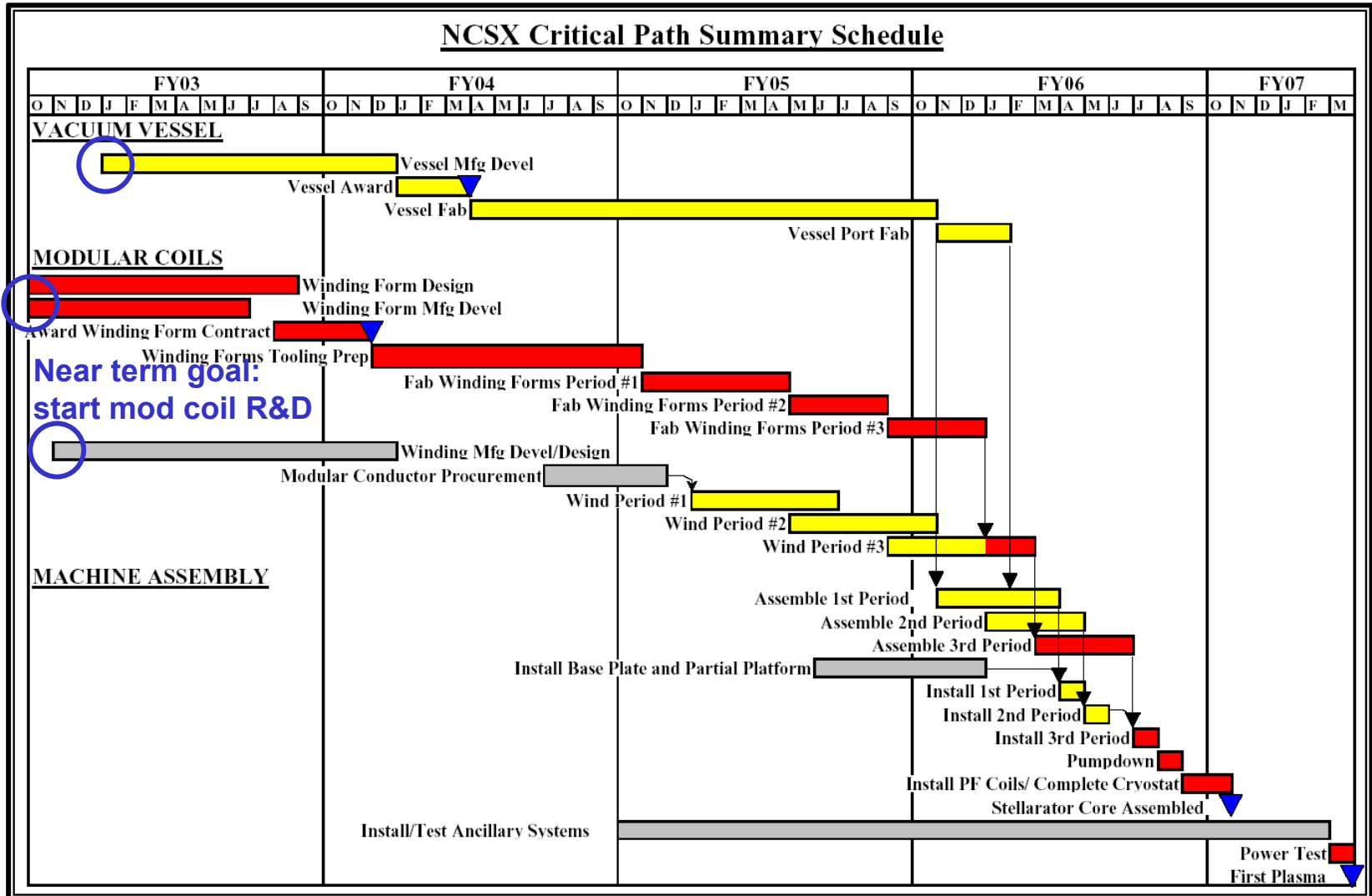
*Group meetings to last one hour max*

**NCSX WBS-1 Engineering Meeting**

**June 26, 2002**

# Schedule

## Modular coils and vacuum vessel are on critical path

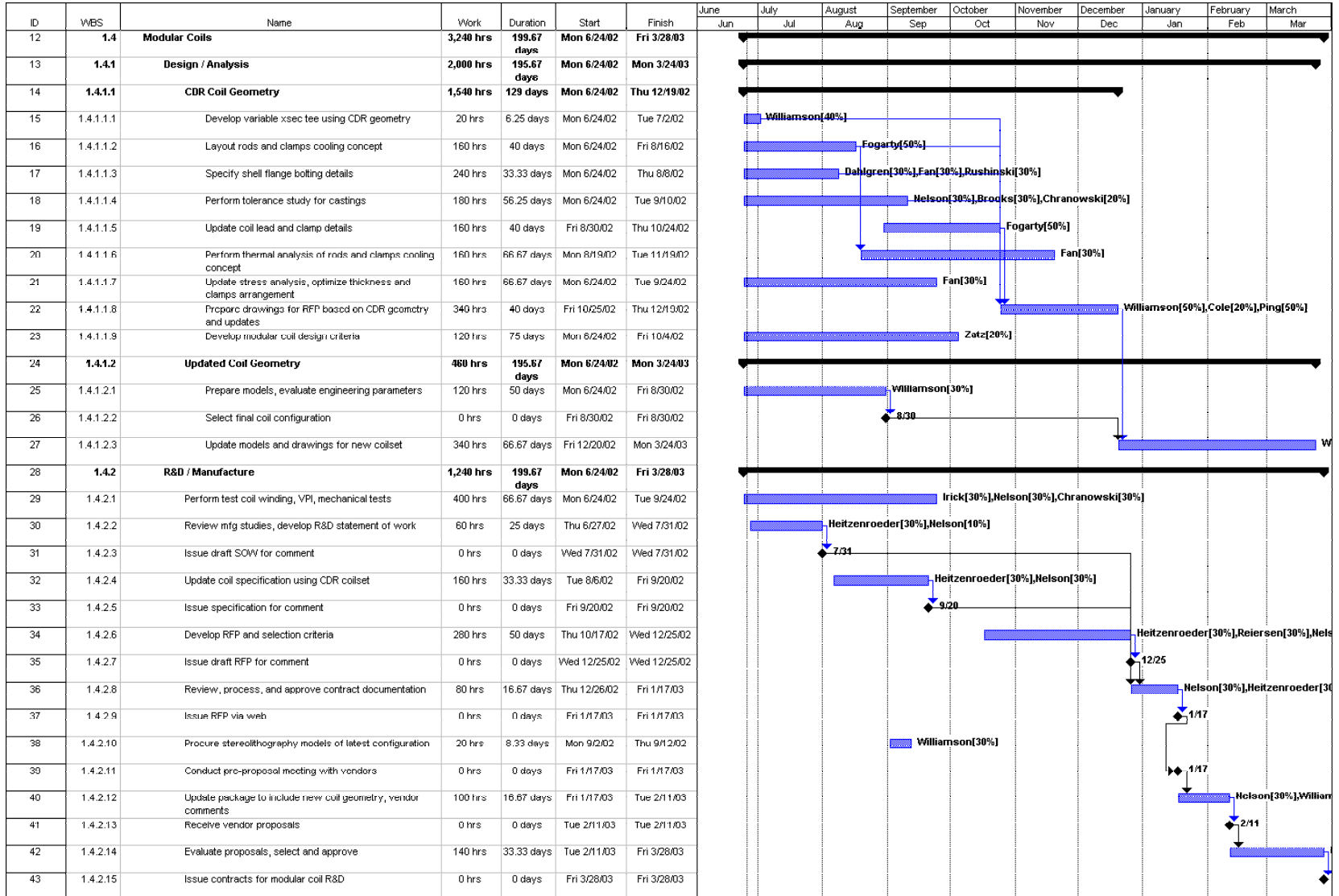


# Near Term Schedule – WBS 1

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- **Major goals prior to October 1:**
  - **Develop next iteration of modular coil design**
    - **New coil set (M45H and beyond i.e. m45\_26aP)**
    - **Improved winding form geometry (variable Tee, shell thick.)**
    - **Add winding form details (bolts, shims, insulating spacers,etc.)**
    - **Establish coil protection scope**
  - **Get manufacturing R&D of winding forms started**
    - **Statement of work**
    - **Revised spec and drawings**
    - **Bid and award cycle starts**
  - **Develop plans for modular coil winding R&D**
  - **Tweak VV/PF/TF designs as required to match new mod coil set, improve structural arrangement, etc.**
  - **Prepare all work packages for FY2003**

# Near Term Schedule – WBS 1



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ID	WBS	Name	Work	Duration	Start	Finish	June	July	August	September	October	November	December
							Jun	Jul	Aug	Sep	Oct	Nov	Dec
39	1.4	<b>Modular Coils</b>	<b>2,866.4 hrs</b>	<b>111.33 days</b>	<b>Mon 6/17/02</b>	<b>Tue 11/19/02</b>	[Gantt bar from Jun to Nov]						
40	1.4.1	<b>Design / Analysis</b>	<b>1,360 hrs</b>	<b>80 days</b>	<b>Mon 6/17/02</b>	<b>Fri 10/4/02</b>	[Gantt bar from Jun to Oct]						
41	1.4.1.1	Develop draft "B" spec (SRD) for mod coils	40 hrs	25 days	Mon 6/17/02	Fri 7/19/02	[Gantt bar: Williamson[10%], Nelson[10%]]						
42	1.4.1.2	<b>CDR Coil Geometry</b>	<b>1,440 hrs</b>	<b>80 days</b>	<b>Mon 6/17/02</b>	<b>Fri 10/4/02</b>	[Gantt bar from Jun to Oct]						
43	1.4.1.2.1	Develop variable xsec tee using CDR geometry	20 hrs	6.25 days	Mon 6/24/02	Tue 7/2/02	[Gantt bar: Williamson[40%]]						
44	1.4.1.2.2	Layout rods and clamps cooling concept -worst case 3-D	160 hrs	20 days	Mon 7/1/02	Fri 7/26/02	[Gantt bar: Fogarty[50%], Goranson[50%]]						
45	1.4.1.2.3	Specify shell flange and bolting details	200 hrs	27.78 days	Mon 6/24/02	Wed 7/31/02	[Gantt bar: Dahlgren[30%], Fan[30%], Rushinski[30%]]						
46	1.4.1.2.4	Perform tolerance study for castings	180 hrs	56.25 days	Mon 6/24/02	Tue 9/10/02	[Gantt bar: Nelson[30%], Brooks[30%], Chranowski[20%]]						
47	1.4.1.2.5	Update coil lead and clamp details (define crossover pockets, lead holes,	80 hrs	20 days	Mon 7/29/02	Fri 8/23/02	[Gantt bar: Fogarty[50%]]						
48	1.4.1.2.6	Perform thermal analysis of rods and clamps cooling concept	120 hrs	25 days	Wed 6/26/02	Tue 7/30/02	[Gantt bar: Fan[60%]]						
49	1.4.1.2.7	Update stress analysis, optimize thickness and clamps arrangement	240 hrs	25 days	Wed 7/31/02	Tue 9/3/02	[Gantt bar: Fan[90%], Dahlgren[30%]]						
50	1.4.1.2.8	re-model shell surfaces in thin, overlap areas	120 hrs	30 days	Mon 6/17/02	Fri 7/26/02	[Gantt bar: Cole[50%]]						
51	1.4.1.2.9	Prepare drawings for RFP based on CDR geometry and updates	200 hrs	23.53 days	Mon 7/1/02	Thu 8/1/02	[Gantt bar: Williamson[50%], Cole[20%], Ping[50%]]						
52	1.4.1.2.10	Develop modular coil design criteria	120 hrs	75 days	Mon 6/24/02	Fri 10/4/02	[Gantt bar: Zatz[20%]]						
53	1.4.1.3	<b>Updated Coil Geometry</b>	<b>380 hrs</b>	<b>65.89 days</b>	<b>Mon 6/24/02</b>	<b>Mon 9/23/02</b>	[Gantt bar from Jun to Oct]						
54	1.4.1.3.1	Prepare models, evaluate engineering parameters	40 hrs	16.67 days	Mon 6/24/02	Tue 7/16/02	[Gantt bar: Williamson[30%]]						
55	1.4.1.3.2	Select final coil configuration	0 hrs	0 days	Mon 7/22/02	Mon 7/22/02	[Gantt bar: 7/22]						
56	1.4.1.3.3	Update models and drawings for new coilset as basis for R&D	340 hrs	37.36 days	Thu 8/1/02	Mon 9/23/02	[Gantt bar: Williamson[30%], Cole[20%], Ping[50%], Jones[50%]]						
57	1.4.2	<b>R&amp;D / Manufacture</b>	<b>1,006.4 hrs</b>	<b>111.33 days</b>	<b>Mon 6/17/02</b>	<b>Tue 11/19/02</b>	[Gantt bar from Jun to Nov]						
58	1.4.2.1	Perform test coil winding, VPI, mechanical tests	400 hrs	66.67 days	Mon 6/24/02	Tue 9/24/02	[Gantt bar: Irick[30%], Nelson[30%], Chranowski[30%]]						
59	1.4.2.2	<b>Develop SOW</b>	<b>60 hrs</b>	<b>25 days</b>	<b>Thu 6/27/02</b>	<b>Wed 7/31/02</b>	[Gantt bar from Jun to Jul]						
62	1.4.2.3	<b>Develop draft product spec and update Pro/E model</b>	<b>160 hrs</b>	<b>31.33 days</b>	<b>Tue 8/6/02</b>	<b>Fri 9/20/02</b>	[Gantt bar from Aug to Sep]						
65	1.4.2.4	<b>Develop RFP and selection criteria</b>	<b>112 hrs</b>	<b>39 days</b>	<b>Tue 7/9/02</b>	<b>Fri 8/30/02</b>	[Gantt bar from Jul to Aug]						
70	1.4.2.5	<b>Review, process, and approve contract documentation</b>	<b>14.4 hrs</b>	<b>2 days</b>	<b>Fri 9/20/02</b>	<b>Tue 9/24/02</b>	[Gantt bar from Sep to Sep]						
74	1.4.2.6	Procure stereolithography models of latest configuration	20 hrs	20 days	Tue 8/20/02	Mon 9/16/02	[Gantt bar: Williamson[13%]]						
75	1.4.2.7	<b>Suppliers develop proposals</b>	<b>100 hrs</b>	<b>30 days</b>	<b>Tue 9/24/02</b>	<b>Tue 11/5/02</b>	[Gantt bar from Sep to Nov]						
79	1.4.2.8	<b>Award contracts</b>	<b>140 hrs</b>	<b>10 days</b>	<b>Tue 11/5/02</b>	<b>Tue 11/19/02</b>	[Gantt bar from Nov to Nov]						

# Task Plans

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- **Tasks will evolve as follows:**
  - **Task list identifies potential tasks**
  - **Planning package gathers smaller tasks together, defines total scope, provides a draft schedule, budgets effort, defines deliverables**
  - **Work Package prepared just before task begins, verifies scope, budget and schedule**
- **Status of major tasks will be reported monthly**
- **Tasks will be considered complete when task deliverables are completed**



# Task Plans

WBS	Task	Lead	Support	Start Date	Finish Date	% complete
11	Modify PFC boundary/limits to accommodate plasma, divertor, RF launchers, etc	Cole	Mioduszewski, Majeski, Nelson			
12	Develop "B" spec (SRD) for VV	Goranson	Nelson	June 26		
12	Update draft VV specification	Goranson		June 26		
14	Develop "B" spec (SRD) for modular coils	Williamson	Nelson			
14	Evaluate mod coil options for engineering parameters	Williamson				
14	Analyze re-design of modular coil cooling configuration (rods and clamps)	Fan	Fogarty, Goranson	June		
14	Define shell joints, bolts, shims, insulators	Dahlgren	Fan, Designer			
14	shell geometry mods to correct thin sections	Cole	Williamson			
14	Finalize procurement strategy for castings	Heitzenroeder	Nelson			
14	Update draft mod coil specification	Heitzenroeder	Chrzanowski			
14	Winding R&D	UT (Nelson)	Chrzanowski			
19	Develop schedule for WBS 1 through FY02	Nelson	Williamson, Cole, Goranson	May 24	July 1	90%
19	Perform systematic coil tolerance study	Brooks	Nelson, Cole			
19	Develop scope and concept for coil protection system	Nelson	TBD			
19	Re-draft design criteria for struct, coils, etc., include existing data, identify holes in data	Zatz				
19	Evaluate space requirements for soft x-ray tomography cameras	Cole	Johnson			
19	migrate to new version of Pro-E	Cole, Brown				
19	map cost, other documents to new WBS structure	Strykowski Simmons				



# Issues – Mod coils

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- **It will be difficult to accelerate the schedule for release of the Casting R&D RFP much before Oct. 2002.**
- **Variable tee width may not be necessarily be desirable**
- **Need to develop mechanical / thermal / fatigue properties for mod coils as soon as possible**
  - **UT winding oblong coil from prototype conductor**
  - **PPPL to VPI the coil**
  - **Test plans, property evaluations need to be coordinated with design criteria needs**

# Issues - Other

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**Investment casting – manf study or not? Quantify payoff**

**Procurement strategy meeting Friday at 2:00? Check conflicts**