

**PrincetonUniversity Plasma Physics Laboratory  
PPPL COST PERFORMANCE REPORT WORKBREAKDOWN STRUCTURE**

**NCSX**

**APRIL 2006**

\*\*\*\* Cumulative to date FY03, FY04, FY05 & FY06\*\*\*\*

**APRIL 2006**

	CURRENT MONTH							CUMULATIVE TO DATE (from 4/1/03) (k)							ECP 43	ETC (May thru Sept)	EAC Thru FY06	UNDER (OVER)	Variance Explanation		
	BCWS	BCWP	ACWP	SV	SPI	CV	CPI	Budgeted Cost			VARIANCES								Budget Thru FY06	Schedule	Cost
								BCWS	BCWP	ACWP	Sch Var	SPI	Cst Var	CPI							
<b>1 - Stellarator Core Systems</b>	1,032	1,077	1,425	45	1.04	-348	0.76	39,168	37,455	38,973	-1,714	.96	-1,518	.96	44,349		46,131				
<b>12 Vacuum Vessel Systems</b>	10	113	156	103	11.39	-43	0.72	8,993	7,941	8,196	-1,052	.88	-255	.97	9,159		9,531				
CLOSED 1201 - Vacuum Vessel Prelim Dsn								424	424	424	0	1.00	0	1.00	424		424				
CLOSED 1202 - Vacuum Vessel R&D								1,770	1,770	1,771	0	1.00	0	1.00	1,770		1,771				
1203 - Vacuum Vessel Final Dsn	1	25	10	24		15	2.48	1,099	1,052	1,129	-47	.96	-77	.93	1,098	22	1,151	Final assy requirements & assy drawings.	BUDGET EXCEEDED		
1204-VV Sys Procurements (non VVSA)	3	1	48	-2		-48		70	34	144	-37	.48	-110	.23	193	199	343	Heater tape,tubing and manifolds behind schedule. Delivery should not impact installation on vac vessel.	Vsl vertical support fabrication and _____		
CLOSED 1206 - VV Field Weld Joint R&D								16	16	16	1	1.03	0	1.00	16		16				
1250 - Vacuum Vessel Fabrication	6	87	98	81	13.61	-10	0.89	5,614	4,644	4,712	-970	.83	-68	.99	5,658	1,114	5,826	VVSA Behind original plan. First sector delivered. 2nd sector forecast June06 (11 months off critical path) and last sector forecast August 06 (12 months off critical path and 1 month ahead of Level II milestone.	Title III and vendor oversight cost to analyze NCR impact.		
<b>13 Conventional Coils</b>	53	26	65	-27	0.49	-39	0.39	2,327	1,956	2,163	-371	.84	-208	.90	2,765		2,997				
1301 - TF Design								946	925	969	-21	.98	-45	.95	946		969				
1302 - PF Design								11	21	21	10	1.94	0	1.01	11		21				
1303 - Central Solenoid Support Design									86	99	86			-13	.87	22	120				
1350 - TF Coil Fabr Prep								743	502	549	-241	.68	-46	.92	743	16	564	All fabrication hardware placed on hold. Work to be outsourced and schedule to be revised.			
1351 - TF Coil Fabr Supplies	18	11	8	-7	0.60	3	1.31	507	371	432	-136	.73	-61	.86	811	32	465	Copper lead fabrication and insulation procurement behind. Other procurements are now included as part of the TF contract to be placed . Schedule to be revised to reflect outsourcing of work scope.	Engr oversight		
1361 - TF Fabrication	35	7	12	-27		-5	0.60	120	51	93	-69	.42	-42	.55	254	765	858	Work to be outsourced and schedule to be revised.	TF procurement process engr oversight		
<b>14 Modular Coils</b>	812	828	1,093	16	1.02	-265	0.76	23,700	23,559	24,481	-141	.99	-922	.96	27,311		28,671				
CLOSED 1401 - Mod Coil Prel.Dsn								304	304	304	0	1.00	0	1.00	304		304				
CLOSED 1402 - Mod.Coil Analyses								239	239	239	0	1.00	0	1.00	239		239				
1403 - Modular Coil Final Design (includes job 1421 coil interface hw dsn)	8	1	13	-7	0.17	-12	0.10	3,287	3,200	3,445	-87	.97			3,339	234	3,679	Final assy dwgs and analysis forecast for May. Fabrication of coils progressing with preliminary drawings.	Cost variance of type C , A&B combined =+23k cpi=1.01. Apparent mischarging by individuals plus real cost reductions in Type a and B design). No significant cost impact.		
1416 - Mod Coil Type A&B Final Design	53	91	35	38	1.72	56	2.61	742	511	243	-231	.69	-245	.93	756	255	498	Type B lead assy, chill plate and cladding now forecast for May completion. Should support procurement of hardware for mid August delivery of B-1.			

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		Budgeted Cost							VARIANCES								Budget Thru FY06	EAC Thru FY06	Schedule	Cost
		BCWS	BCWP	ACWP	SV	SPI	CV	CPI	BCWS	BCWP	ACWP	Sch Var								
CLOSED 1404-MCWF R&D & 1st Prod Casting								2,544	2,544	2,544	0	1.00	0	1.00	2,544		2,544			
CLOSED 1405-Mod Coil Winding R&D Prep								168	168	168	0	1.00	0	1.00	168		168			
CLOSED 1406 - Mod. Coil Winding Facility								2,247	2,247	2,264	0	1.00	-17	.99	2,247		2,264		Overtime reconciliation	
CLOSED 1407 -Mod Coil Winding Facility								2,546	2,546	2,571	0	1.00	-25	.99	2,546		2,571		Overtime reconciliation	
1408-Mod Coil Winding Supplies	101	126	135	25	1.24	-9	0.93	1,152	1,261	1,292	109	1.09	-31	.98	1,638	324	1,616			
CLOSED 1409 - Mod. Coil Test Stand								916	916	862	0	1.00	54	1.06	916		862			
CLOSED 1410 MC Twisted Racetrack Fabr			2					1,050	1,050	1,052	0	1.00	-2	1.00	1,050		1,052			
1411-MCWF Fabrication S005242	418	442	456	24	1.06	-14	0.97	6,416	6,615	6,621	199	1.03	-7	1.00	8,098	1,837	8,458			
CLOSED 1412 - Complete Winding Facilities			1					537	537	542	0	1.00	-5	.99	537		542		Overtime reconciliation	
CLOSED 1413 - Mod Coil Fracture Analysis								28	28	28	0	1.01	0	1.01	28		28			
1414 - Coil Testing	22	7	54	-15				253	223	400	-30	.88	-177	.56	276	69	469		Extent of effort required to prepare for the mod coil testing has exceeded expectations. Only one modular coil to be tested.	
CLOSED 1415 - Dimensional Control Testing								24	24	24	0	.99	0	.99	24		24			
CLOSED 1419 - Winding Facility Modification			1					48	48	56		1.00	-8	.85	48		56			
1451 - Mod Coil Winding	211	161	347	-50	0.76	-186	0.46	1,200	1,098	1,675	-102	.92	-576	.66	2,553	1,310	2,985	C-2 and C-3 experienced metrology related delays. Forecast winding station completions; C-2 5/8 (4.5 week late), C-3 6/6 (2 weeks late), C4 7/20 (4 weeks late), C5 8/18 (2.5 weeks late).	Unplanned work accounts for 22% of cost. Job to be replanned.	
1459 - MC Unplanned rework			48							150			-150			161	311			
<b>15 Structures</b>	<b>28</b>	<b>3</b>	<b>-28</b>	<b>-3</b>				<b>147</b>	<b>80</b>	<b>86</b>	<b>-66</b>	<b>.55</b>	<b>-5</b>	<b>.94</b>	<b>208</b>		<b>150</b>			
1501 - Structures Design	28	3	-28	-3				147	80	86	-66	.55	-5	.94	208	64	150	Work scope follows conclusion of PF CS support job 1303.		
<b>16 16 - Coil Services</b>										3			-3				3			
<b>17 Cryostat and Base</b>	<b>6</b>	<b>6</b>	<b>-6</b>	<b>-6</b>				<b>377</b>	<b>368</b>	<b>420</b>	<b>-9</b>	<b>.98</b>	<b>-52</b>	<b>.88</b>	<b>377</b>		<b>473</b>			
1701-Cryost&Base Sprt Strct Dsn	6	6	-6	-6				377	368	420	-9	.98	-52	.88	377	52	473		?	
<b>18 Field Period Assembly</b>	<b>88</b>	<b>69</b>	<b>80</b>	<b>-19</b>	<b>0.78</b>	<b>-11</b>	<b>0.87</b>	<b>1,841</b>	<b>1,766</b>	<b>1,855</b>	<b>-75</b>	<b>.96</b>	<b>-89</b>	<b>.95</b>	<b>2,526</b>		<b>2,363</b>			
CLOSED 1801-Field Period Assy								61	61	65		1.00	-4	.94	61		65			
1802 - FP Assy Oversight&Support	31	31	30	0	0.99	1	1.02	550	550	535	0	1.00	15	1.03	718	200	734			
1803- FP Assy Tooling/Constructability	37	31	48	-6	0.85	-17	0.65	759	689	712	-70	.91	-23	.97	933	178	890	Structural analysis of half period assy and MC turning fixture behind. 5 months off critical path.		
1804-FP Assy Measurement		2	0	2	2	27.14		442	451	532	10	1.02	-81	.85	452	-	532		Unbudgeted purchase of 3rd Romer arm as well as repair to an existing arm.	
1810 - Field Period Assembly	20	5	1	-15	0.24	3		29	14	11	-15	.49	3	1.27	362	130	141			
<b>19 1901 - Stellarator Core Mngt&amp;Integr</b>	<b>41</b>	<b>41</b>	<b>22</b>	<b>0</b>	<b>0.99</b>	<b>18</b>	<b>1.82</b>	<b>1,783</b>	<b>1,785</b>	<b>1,769</b>	<b>1</b>	<b>1.00</b>	<b>16</b>	<b>1.01</b>	<b>2,003</b>	<b>175</b>	<b>1,944</b>			
<b>2 - Plasma Heating, Fueling &amp; Vac Sys</b>	<b>-1</b>			<b>1</b>				<b>348</b>	<b>349</b>	<b>348</b>	<b>1</b>	<b>1.00</b>	<b>1</b>	<b>1.00</b>	<b>349</b>		<b>348</b>			
CLOSED 2001-VPS Gas& Cond Sys Oversight	-1			1				64	64	63	1	1.01	1	1.02	64		63			
CLOSED 2501 - Neutral Beam Refurbishment	-1			1				285	285	285	1	1.00	0	1.00	285		285			
<b>3 - Diagnostics</b>	<b>24</b>	<b>25</b>	<b>35</b>	<b>1</b>	<b>1.03</b>	<b>-11</b>	<b>0.70</b>	<b>625</b>	<b>633</b>	<b>714</b>	<b>8</b>	<b>1.01</b>	<b>-81</b>	<b>.89</b>	<b>770</b>		<b>867</b>			
31 3101 Magnetic Diagnostics	18	19	33	1	1.04	-14	0.58	310	318	408	8	1.03	-90	.78	425	138	546		Engineering time 7 times greater than estimated plus technician support req'd to fabr term boxes exceeding estimates.	
39 3901 - Diagnostics sys Integration	6	6	3	0	0.99	3	1.99	315	315	306		1.00	9	1.03	345	16	321			

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	BCWS	BCWP	ACWP	SV	SPI	CV	CPI	Budgeted Cost			VARIANCES								Budget Thru FY06	Schedule	Cost
								BCWS	BCWP	ACWP	Sch Var	SPI	Cst Var	CPI							
<b>4 - Electrical Power Systems</b>	7	6	5	-1	0.84	1	1.19	710	578	718	-132	.81	-140	.80	742		754				
41 4101 - AC Power	0			0				107	108	107	1	1.01	0	1.00	107		107				
43 4301 - DC Systems	2		-2	-2		2		310	272	382	-38	.88	-111	.71	314	16	399		Unbudgeted redesign of C-site power systems		
44 4401 - Control & Protection			1			-1		55	59	83	4	1.08	-24	.71	55		83				
45 4501 - Power Sys Dsn & Integr	5	6	6	1	1.10	0		238	139	144	-99	.58	-6	.96	265	20	164		C-site power systems PDR planned for mid-June. Work to be halted afterwards until FY07.		
46 4601 - FCPC Bldg Mods								1	1	1	0	1.30		1.00	1		1				
<b>5 - Central I&amp;C Systems</b>								33	33	33		1.00	0	1.00	33		33				
58 5801 -Central I&C Integr								33	33	33		1.00	0	1.00	33		33				
<b>6 - Facility Systems</b>								24	24	24		1.00	0	.99	24		24				
6163 - Facility Systems Support FY04								15	15	15		1.00	0	1.01	15		15				
62 - Cryogenic Systems																					
63 - Utility Systems																					
CLOSED 6501 - Facility Systems Integration								9	9	9		1.00	0	.96	9		9				
<b>7 - Test Cell Prep &amp; Machine Assy</b>	0		0	0		0		897	905	942	8	1.01	-37	.96	915		949				
CLOSED 7101 - Shield Wall Modif								32	32	33		1.00	-1	.98	32		33				
7201 - Control Room Walls&Floors																					
7301 - Platform Design &	0		0	0		0		71	72	76	1	1.02	-4	.95	71		76				
7401 - TC Prep & Mach Assy Planning								794	801	833	7	1.01	-32	.96	812	7	840				
<b>8 - Project Oversight &amp; Support</b>	185	190	247	5	1.03	-57	0.77	7,665	7,670	7,993	5	1.00	-323	.96	8,665		9,000				
<b>81 Project Management and Control</b>	91	93	85	2	1.02	8	1.10	3,635	3,637	3,712	2	1.00	-75	.98	4,126		4,188				
8101 - Project Management & Control	51	52	60	1	1.02	-8	0.86	2,314	2,315	2,353	1	1.00	-38	.98	2,588	279	2,631				
8102 - NCSX MIE Management ORNL	14	14	16	0	1.02	-2	0.89	354	354	362	0	1.00	-8	.98	429	80	442				
8998 - Allocations	26	27	9	1	1.02	18	3.14	967	968	997	1	1.00	-30	.97	1,109	118	1,115				
<b>82 Project Engineering</b>	94	97	162	2	1.03	-65	0.60	3,560	3,563	3,811	3	1.00	-248	.94	4,069		4,342				
8202 - Engr Mgmt & Sys Eng Support	50	51	59	1	1.02	-8	0.87	1,971	1,972	2,024	1	1.00	-52	.97	2,241	254	2,278				
8203 - Design Integration	11	12	27	0	1.03	-15	0.43	766	766	778	0	1.00	-12	.99	826	76	854				
8204 - Systems Analysis	18	18	59	0	1.03	-41	0.31	627	628	810	1	1.00	-182	.77	724	121	931		Unplanned integrated structural analysis of MC inboard connection and machine support locations.		
8205 - Dimensional Control Coord.	15	16	17	0	1.03	-1	0.92	197	197	199	1	1.00	-2	.99	278	81	280				
<b>84 Project Physics</b>	0			0				470	470	470	0	1.00	0	1.00	470		470				
CLOSED 8401 - Project Physics								324	324	324		1.00	0	1.00	324		324				
CLOSED 8402 - Project Physics MIE ORNL	0			0				146	146	146	0	1.00	0	1.00	146		146				
<b>Subtotal</b>	1,246	1,297	1,712	51	1.04	-415	0.76	49,470	47,647	49,744	-1,823	.96	-2,097	.96	55,848	8,113	(250) rate adj				
<b>Contingency/Management Reserve</b>															1,295						
<b>Incremental Funding</b>															1,291						
<b>1% hold back on FY06 BA</b>															(172)						
<b>DCMA QA Inspection services</b>															75						
<b>TOTAL PROJECT</b>															58,337	57,857	480				
(1) Reflects accrual increase of \$155 k based on MTM's earned value report																					
(2) Reflects accrual increase of \$ 207 k based on EIO's earned value report																					

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		BCWS	BCWP	ACWP	SV	SPI	CV	CPI	Budgeted Cost		VARIANCES								
									BCWS	BCWP	ACWP	Sch Var	SPI	Cst Var	CPI				
Thru FY2004								20,640	19,652	19,744	-988	0.95	-92	1.00					
Thru Oct								20,637	20,832	20,917	195	1.01	-85	1.00					
Thru NOVEMBER								21,812	21,906	22,158	94	1.00	-252	0.99					
Thru DECEMBER								23,813	23,042	23,434	-771	0.97	-392	0.98					
Thru JANUARY (ecp-21)								25,866	24,310	24,639	-1556	0.94	-329	0.99					
Thru Feb (ecp-24)								26,637	25,856	26,285	-781	0.97	-429	0.98					
Thru Mar (ecp-29)								28,440	27,282	28,004	-1158	0.96	-722	0.97					
Thru Apr (ecp-30)								29,588	28,736	29,416	-852	0.97	-680	0.98					
Thru May (ecp-30)								31,301	29,903	30,889	-1398	0.96	-986	0.97					
Thru June (ecp-30)								32,740	31,362	32,719	-1378	0.96	-1357	0.96					
Thru July (ecp-36)								35,206	33,682	34,276	-1524	0.96	-594	0.98					
Thru Aug (ecp-36)								36,914	35,480	36,416	-1434	0.96	-936	0.97					
Thru Sep (ecp-36)	Thru Sep (ecp-36)							38,562	36,721	38,314	-1841	0.95	-1593	0.96	BCWR				
<i>PARS for OCT</i>								1,710	3,061	1,485	-90	0.94	-17	0.98	for October only				
Thru Oct (ecp-39)								40,272	39,782	39,799	-490	0.99	-17	1.00	43,018				
<i>PARS for NOV</i>								1,673	1,060	1,394	-613	0.63	-334	0.76					
Thru NOV (ecp-39)								41,945	40,842	41,193	-1103	0.97	-351	0.99	41,958				
<i>PARS for DEC</i>								1,274	896	1,331	-378	0.70	-435	0.67					
Thru DEC (ecp-39)								43,219	41,738	42,524	-1481	0.97	-786	0.98	41,062				
<i>PARS for JAN</i>								1,633	1,594	1,647	-39	0.98	-53	0.97					
Thru JAN (ecp-39)								44,852	43,332	44,171	-1520	0.97	-839	0.98	39,468				
<i>PARS for FEB</i>								1,471	1,431	2,001	-40	0.97	-570	0.72					
Thru FEB (ecp-39)								46,323	44,763	46,172	-1560	0.97	-1409	0.97	38,037				
<i>PARS for MAR</i>								1,900	1,587	1,860	-313	0.84	-273	0.85					
Thru MAR (ecp-043)								48,223	46,350	48,032	-1873	0.96	-1682	0.96	37,330				
<i>PARS for APR</i>								1,247	1,297	1,712	50	1.04	-415	0.76					
Thru APR (ecp-043)								49,470	47,647	49,744	-1823	0.96	-2097	0.96	36,033				
FY06 subtotal=								10,908	9,333	11,430	-1576	0.86	-2097	0.82					

