

LAT Project Status Overview

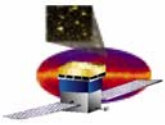
April, 2005

Lowell Klaisner
LAT Project Manager
Rev. -



Summary

- **5 Tracker modules at SLAC**
 - **Module 4 & 5 (6th and 7th) in T/V**
- **18 Calorimeter modules through T/V**
- **4 Tracker modules in Grid**
 - **Ready for 4 tower test this week**
- **Jeff Fisher has left the project**
 - **Terry Schalk will report on flight software today**

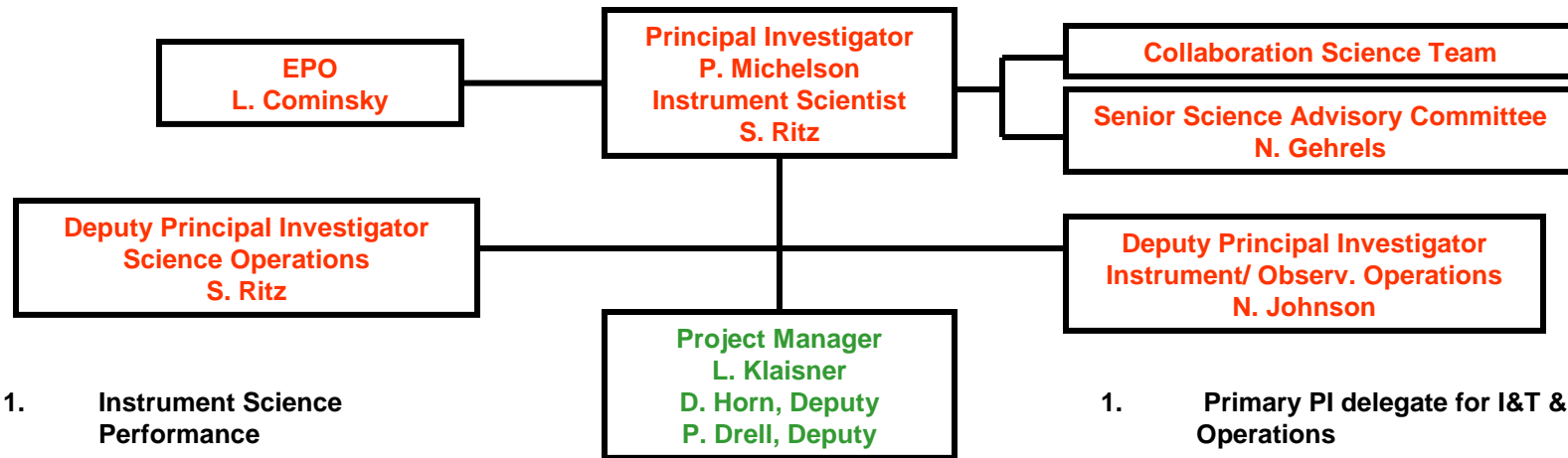


Power Outage

- **8:00 am on Wednesday**
 - **100 foot tall pine tree fell and took out 2 of 3 lines on 230 KV feed (tree outside easement)**
- **60 KV backup line from campus down due to road work east of the site**
- **Power restored on Sunday**
- **Failures in site computer systems**
- **Building 33 had backup power and I&T continued**
 - **Slowed down by lack of access to files**
 - **Needed work arounds in some cases**
- **Non-essential workers sent home**
- **Direct delay in non-I&T activities**



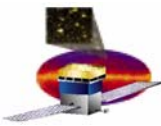
Proposed LAT Organization Chart



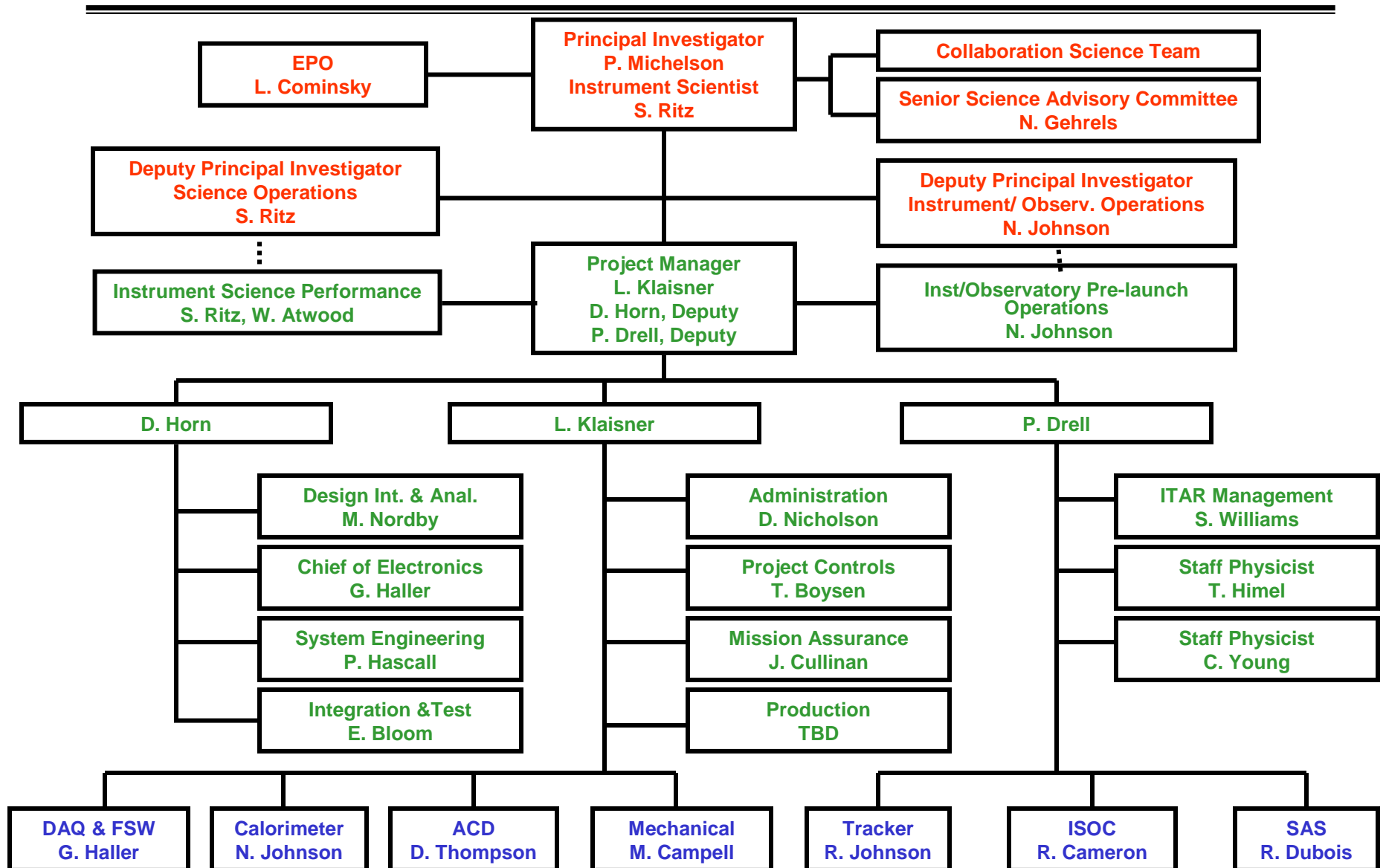
1. Instrument Science Performance
2. Science Verification and Calibration
3. Instrument liaison with science working groups
4. Coordinate science tools with Collaboration requirements

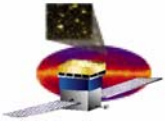
1. Deliver an Instrument that meets the science and mission requirements

1. Primary PI delegate for I&T & ISOC Operations
 - a. Coordination with collaboration for support
 - b. Primary interface for LAT Instrument management regarding operations
 - c. PI representative for Observatory Test and Launch Operations
 - d. PI representative for transition planning from test to flight operations



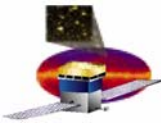
LAT Organization Chart





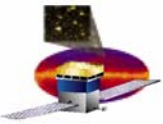
SLAC Reorganization

- **Announcement Today**

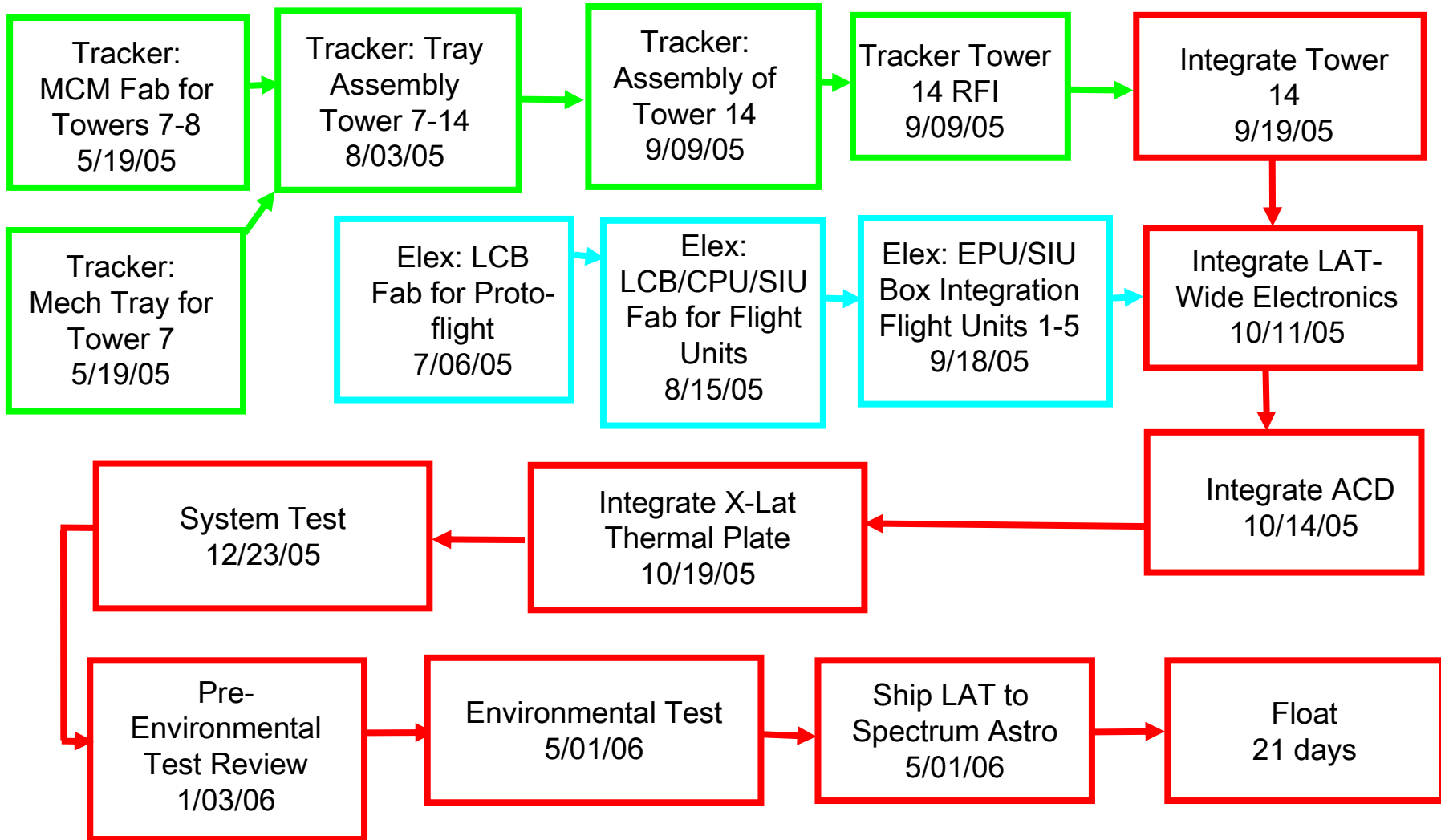


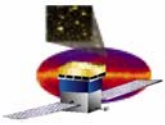
Module Schedule (w/ Tracker update)

M/E April 2005: *New Tracker RFI	Forecast Dates and Float (working days) to "Ship LAT"									
	Mech/ACD		TKR		CAL		ELEC		I&T	
Grid	11/08/04A	-								
1st Module			02/04/05A	-	12/08/04A	-	02/17/05A	-	04/07/05A	-
2nd Module			02/24/05A	-	01/14/05A	-	03/09/05A	-	04/13/05A	-
3rd Module			05/10/05A	-	01/14/05A	-	05/19/05A	-	20-May-05	40
4th Module			05/10/05A	-	01/14/05A	-	05/19/05A	-	26-May-05	40
5th Module			05/10/05A	-	01/14/05A	-	24-May-05	41	3-Jun-05	40
6th Module			9-Jun-05	35	02/22/05A	-	24-May-05	46	17-Jun-05	35
7th Module			06/14/05*	37	02/22/05A	-	1-Jun-05	46	24-Jun-05	35
8th Module			07/05/05*	28	04/25/05A	-	1-Jun-05	51	13-Jul-05	28
9th Module			07/06/05*	32	04/25/05A	-	8-Jun-05	51	20-Jul-05	28
10th Module			07/29/05*	20	04/25/05A	-	8-Jun-05	56	8-Aug-05	20
11th Module			08/02/05*	23	13-May-05	71	15-Jun-05	56	15-Aug-05	20
12th Module			08/16/05*	18	13-May-05	76	15-Jun-05	61	24-Aug-05	18
13th Module			08/18/05*	21	13-May-05	81	22-Jun-05	61	31-Aug-05	18
14th Module			08/25/05*	21	18-May-05	83	22-Jun-05	66	8-Sep-05	18
15th Module			09/07/05*	18	23-May-05	85	29-Jun-05	66	15-Sep-05	18
16th Module			9-Sep-05	21	25-May-05	88	29-Jun-05	71	22-Sep-05	18
ACD	15-Jul-05	81								
X-LAT	1-Jun-05	115								
Radiators	22-Jul-05	144								
Harness							5-Jul-05	73		
PDU							23-Aug-05	38		
GASU							8-Sep-05	27		
1st EPU/SIU							6-Sep-05	29		
Last EPU/SIU							16-Sep-05	21		
FSW Cand Test Start							31-May-05	55		
FSW FQT							30-Aug-05	34		
Inst Global Items									24-Oct-05	18
System Test									6-Jan-06	18
LAT Arrives at NRL									14-Jan-06	18
EMI/EMC Test									15-Feb-06	18
Sine Vibe									28-Feb-06	18
Acoustic Test									12-Mar-06	18
TVAC									29-Apr-06	18
Weight & CG									1-May-06	18
Preship Review									2-May-06	18
Ship LAT									7-May-06	18



Critical Path to Ship LAT to Spectrum Astro





Critical Path to Ship LAT to Spectrum Astro

- **1st critical path:** a) Electronics LCB Proto-flight Unit
b) Tracker Fab: MCMs Towers 7-8, Mech Tray Twr 7
21 days float to Ship LAT to Spectrum Astro
- **2nd critical path:** a) Tracker Cables Tower 5
b) Electronics Proto-Flight GASU/CPU
6 days behind 1st critical path
- **3rd critical path:** Tracker Tower 5 Assembly
15 days behind 2nd critical path
- **1st critical path to I&T 4 Tower CPT: Electronics TEM/TEM PS**

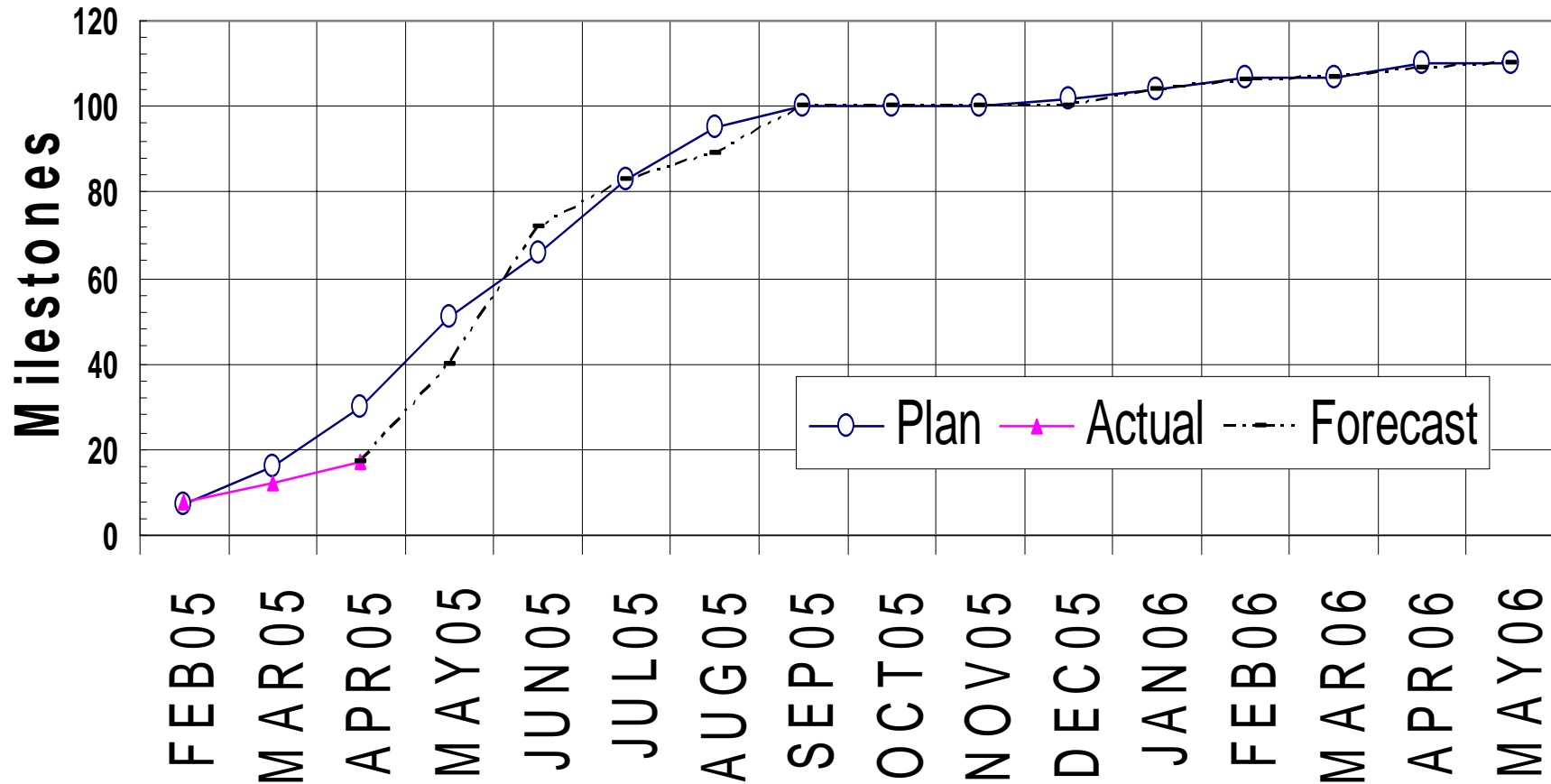


Level 1 & 2 Milestones

Activity ID	Activity Description	Baseline Finish	Bsln Var	Early Finish	Fiscal Year																	
					FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12						
DOE/NASA Joint Oversight Group (Level 1)																						
1M1P000000	DOE Critical Decision (CD) 0 Approval	06/25/01A	0	06/25/01A	▼																	
1M1P000010	CD-1 Approval	07/23/02A	0	07/23/02A			▼															
1M1P000020	CD-2 Approval	11/08/02A	0	11/08/02A				▼														
1M1P000030	CD-3 Approval	09/03/03A	0	09/03/03A					▼													
1M1P000060	Flight GRID Complete	11/08/04A	0	11/08/04A																	▼	
1M1P000040	CD-4 Approval	03/15/06*	0	03/15/06*																		▼
DOE/NASA Federal Project Managers (Level 2)																						
1M1BF00000	Launch Balloon Flight	08/01/01A	0	08/01/01A	▼																	
1M1000100	Instrument Preliminary Design Review	01/08/02A	0	01/08/02A			▼															
1M1000110	I-CDR (Critical Design Review)	05/16/03A	0	05/16/03A					▼													
1M1000740	Start LAT Integration	03/23/05	-5	03/30/05A																	▼	
1M1000700	Pre Environmental Testing Review	12/20/05	-4	01/03/06																		▼
1M1000120	PSR-(Instrument Pre-Ship Review)	04/18/06	-6	04/26/06																		▼
Run Date: 05/13/05 15:28					GLAST LAT PROJECT					LT-T1: Level 1 & 2 Milestones					Sheet 1							
Data Date: 05/01/05					Level 1&&2 Milestones					FL-T1: Level 1 & 2 Milestones												
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Level 3 Milestone Count





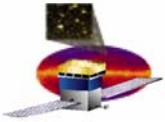
Level 3 Milestones Completed in April 2005

AV	Activity ID	ND	Activity Description	Baseline Finish	Bsln Var	Early Finish	FY05			
							MAR	APR	MAY	
Instrument Project Office (Level 3)										
4.1.5 Calorimeter										
5	1MRTS030	5	Flight Calorimeter Module 6 Ready to Ship	04/18/05	-5	04/25/05A		▼		
5	1MRTS040	5	Flight Calorimeter Module 7 Ready to Ship	04/21/05	-2	04/25/05A		▼		
5	1MRTS050	5	Flight Calorimeter Module 8 Ready to Ship	04/25/05	0	04/25/05A		▼		
4.1.7 Electronics										
7	1M79180		Demo: Inter-task Communications	03/11/05	-25	04/15/05A	◆	▼		
4.1.9 I&T										
9	1M99010	9	Start 2 Tower Comprehensive Performance Test	04/20/05	-3	04/25/05A		▼		
Run Date							05/13/05 14:59	GLAST LAT PROJECT		LT-TB: Completed Level 3 by Subsystem
Data Date							05/01/05	Completed Level 3 Milestones		FL-TB: Level 3 Milestones compl. last month
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								Sort by Subsystem		

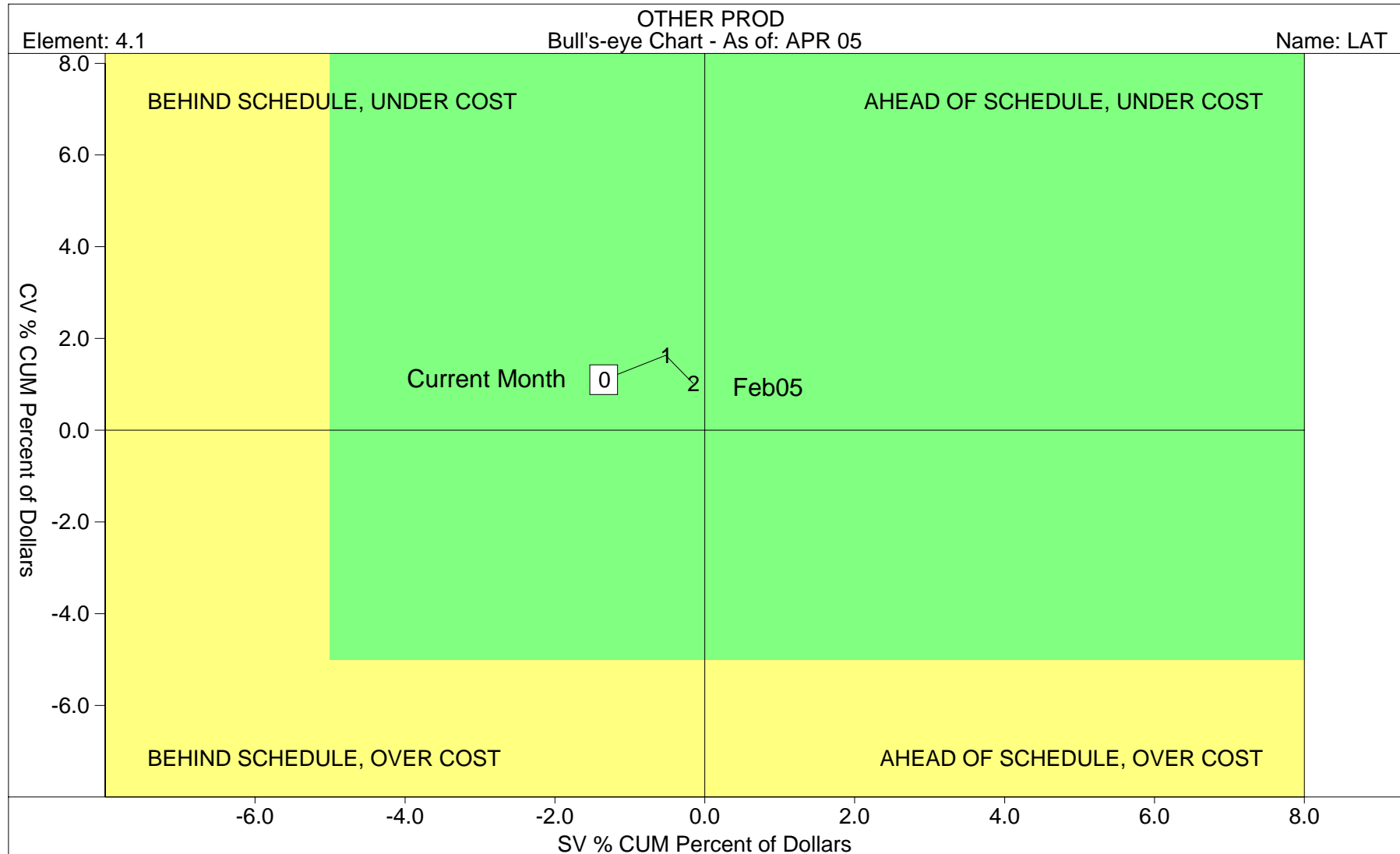


Level 3 Milestones Completed in May 2005

AV	Activity ID	ND	Activity Description	Baseline Finish	Bsln Var	Early Finish	FY05				
							APR	MAY	JUN		
Instrument Project Office (Level 3)											
4.1.4 Tracker											
4	1M1000220	9	Flight Tracker Tower 1 RFI	03/22/05	-35	05/10/05		▽			
4	1M1000221	9	Flight Tracker Tower 2 RFI	04/20/05	-14	05/10/05	◆	▽			
4	1M1000250	9	Flight Tracker Tower 3 RFI	05/03/05	-5	05/10/05		◆	▽		
4.1.7 Electronics											
7	1M79210		Demo: Watchdog	04/15/05	-15	05/06/05	◆	▽			
7	1M79001030	9	Flight TEM Assy 1: Elec to I&T	04/22/05	-17	05/17/05	◆	▽			
7	1M79001040	9	Flight TEM Assy 2: Elec to I&T	04/29/05	-12	05/17/05		◆	▽		
7	1M79002030	9	Flight TEM PS Assy 1: Elec to I&T	04/22/05	-17	05/17/05	◆	▽			
7	1M79002040	9	Flight TEM PS Assy 2: Elec to I&T	04/29/05	-12	05/17/05		◆	▽		
4.1.9 I&T											
9	1M99020	9	Start 4 Tower Comprehensive Performance Test	05/12/05	-7	05/23/05		◆	▽		
Run Date							05/23/05 15:07	GLAST LAT PROJECT		LT-T9: L3 MS Completed Curr Mo (tb)	Sheet 1
Data Date							05/01/05	Level 3 Milestones Completed in May		FL-T2: L3 Milestones Completed Current Month	
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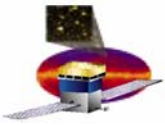
Variance Analysis





CPR Level 3

Cost Performance Report - Work Breakdown Structure												
Contractor:					Contract Type/No:			Project Name/No:		Report Period:		
Location:								LAT		3/31/2005 4/30/2005		
CAPW[3] Item (1)	Current Period					Cumulative to Date					At Completion	
	Budgeted Cost		Actual Cost Work Performed (4)	Variance		Budgeted Cost		Actual Cost Work Performed (9)	Variance		Budgeted (12)	Latest Revised Estimate (13)
	Work Scheduled (2)	Work Performed (3)		Schedule (5)	Cost (6)	Work Scheduled (7)	Work Performed (8)		Schedule (10)	Cost (11)		
4.1.1 INSTRUMENT MANAGEMENT	327	327	201	0	126	16,129	16,129	15,833	0	297	17,645	17,645
4.1.2 SYSTEM ENGINEERING	181	181	174	0	7	6,884	6,884	6,808	0	76	7,647	7,647
4.1.4 TRACKER	819	615	597	-204	18	19,175	18,913	18,731	-263	181	21,702	21,702
4.1.5 CALORIMETER	495	532	406	37	126	21,557	21,544	20,979	-12	565	22,594	22,594
4.1.6 ANTICOINCIDENCE DETECTOR	649	743	523	95	220	17,183	17,057	16,918	-126	139	17,968	17,968
4.1.7 ELECTRONICS	961	466	804	-494	-338	25,958	25,238	25,551	-720	-313	28,894	28,894
4.1.8 MECHANICAL SYSTEMS	653	260	1,081	-394	-822	15,178	14,736	14,651	-443	85	16,866	16,866
4.1.9 INTEGRATION & TEST	486	261	290	-225	-29	7,531	7,214	7,214	-318	0	9,451	9,451
4.1.A PERFORMANCE AND SAFETY ASSURANCE	179	179	176	0	3	3,374	3,374	3,320	0	54	3,846	3,846
4.1.B LAT INSTRUMENT SCIENCE OPERATIONS CENTER	5	5	2	0	3	312	312	306	0	6	334	334
4.1.C EDUCATION AND PUBLIC OUTREACH	98	105	103	6	2	2,329	2,329	2,066	0	263	2,684	2,684
4.1.D SCIENCE ANALYSIS SOFTWARE	77	77	68	0	10	2,690	2,690	2,532	0	157	3,069	3,069
4.1.E SUBORBITAL FLIGHT TEST	0	0	0	0	0	1,325	1,325	1,325	0	0	1,325	1,325
Gen. and Admin.	0	0	0	0	0	0	0	0	0	0	0	0
Undist. Budget											0	0
Sub Total	4,931	3,752	4,425	-1,179	-673	139,624	137,743	136,232	-1,881	1,511	154,025	154,025
Contingency											1,784	1,784
Total	4,931	3,752	4,425	-1,179	-673	139,624	137,743	136,232	-1,881	1,511	155,809	155,809

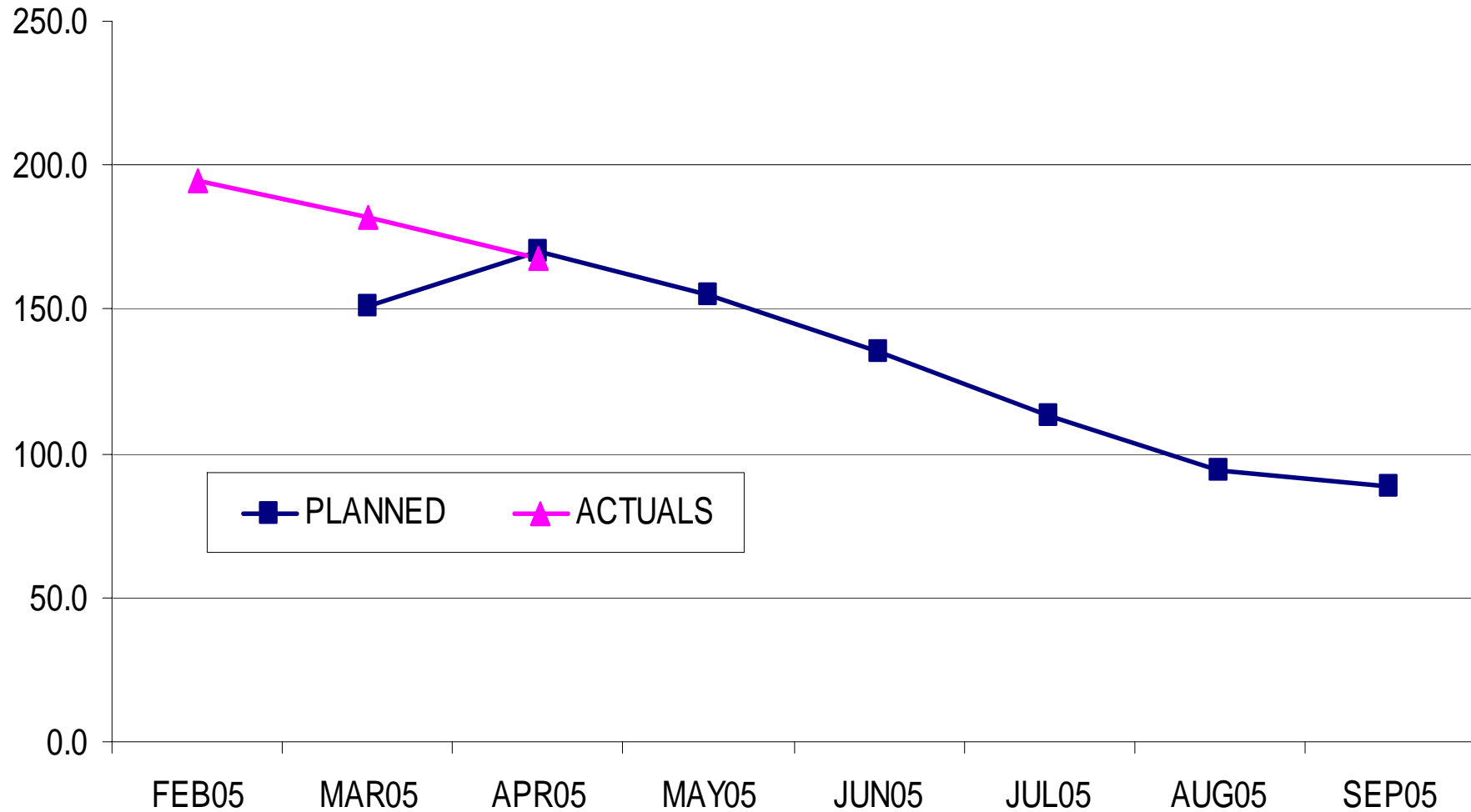


Pending CRs

- **Mechanical -- \$443K schedule variance**
 - **\$323K schedule variance due to 2nd grid**
 - **\$120K schedule variance due to thermal control box**
- **Integration and Test -- \$318K schedule variance**
 - **\$70K Worked planned for FY06 misprogrammed into FY05**
 - **\$145K Components for harnesses at NRL**
 - **\$101K Computer racks for NRL and Spectrum**
- **Tracker -- \$283K schedule variance**
 - **Working with INFN on compressing schedule**
- **Electronics -- \$720K schedule variance**
 - **Working on reprogramming work to reduce**



FTE Report (DOE/NASA-funded only)





Performance Analysis

	WBS	Description	BAC	BCWS	BCWP	ACWP	SV \$	CV \$	%BCWS	%BCWF	%ACWF	SPI	CPI	SPI	CPI	Cpi_Fcst	CpiSpi_Fcst
1	4.1	LAT	154,025	139,624	137,743	136,232	-1,881	1,511	90.65	89.43	88.45	↓	↓	0.987	1.011	152,336	152,556
2	4.1.1	Instr Mgmt	17,645	16,129	16,129	15,833	0	297	91.41	91.41	89.73	↔	↑	1.000	1.019	17,320	17,320
3	4.1.2	System Engr	7,647	6,884	6,884	6,808	0	76	90.03	90.03	89.03	↔	↔	1.000	1.011	7,563	7,563
4	4.1.4	Tracker	21,702	19,175	18,913	18,731	-263	181	88.36	87.15	86.31	↓	↔	0.986	1.010	21,494	21,532
5	4.1.5	Calorimeter	22,594	21,557	21,544	20,979	-12	565	95.41	95.35	92.85	↑	↑	0.999	1.027	22,001	22,002
6	4.1.6	ACD	17,968	17,183	17,057	16,918	-126	139	95.63	94.93	94.16	↑	↑	0.993	1.008	17,821	17,828
7	4.1.7	Electronics	28,894	25,958	25,238	25,551	-720	-313	89.84	87.35	88.43	↓	↓	0.972	0.988	29,252	29,358
8	4.1.8	Mechanical	16,866	15,178	14,736	14,651	-443	85	89.99	87.37	86.87	↓	↓	0.971	1.006	16,769	16,832
9	4.1.9	I&T	9,451	7,531	7,214	7,214	-318	0	79.68	76.32	76.32	↓	↓	0.958	1.000	9,451	9,550
10	4.1.A	PSA	3,846	3,374	3,374	3,320	0	54	87.72	87.72	86.32	↔	↔	1.000	1.016	3,785	3,785
11	4.1.B	ISOC	334	312	312	306	0	6	93.41	93.41	91.54	↔	↑	1.000	1.020	327	327
12	4.1.C	EPO	2,684	2,329	2,329	2,066	0	263	86.77	86.77	76.96	↑	↔	1.000	1.127	2,381	2,381
13	4.1.D	SAS	3,069	2,690	2,690	2,532	0	157	87.62	87.62	82.50	↔	↔	1.000	1.062	2,890	2,890
14	4.1.E	Balloon Flight	1,325	1,325	1,325	1,325	0	0	100.00	100.00	99.98	↔	↔	1.000	1.000	1,325	1,325

LEGEND

BAC: Budget At Complete
 BCWS: Budgeted Cost of Work Scheduled (to date)
 BCWP: Budgeted Cost of Work Performed (to date)
 ACWP: Actual Cost of Work Performed (to date)

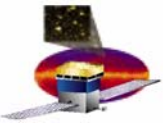
SV \$: Schedule Variance = BCWP - BCWS
 CV \$: Cost Variance = BCWP - ACWP
 SPI: Schedule Performance Index = BCWP/BCWS
 CPI: Cost Performance Index = BCWP/ACWP

% BCWS: Percent Scheduled = BCWS/BAC
 % BCWP: Percent Complete = BCWP/BAC
 % ACWP: Percent Spent = ACWP/BAC

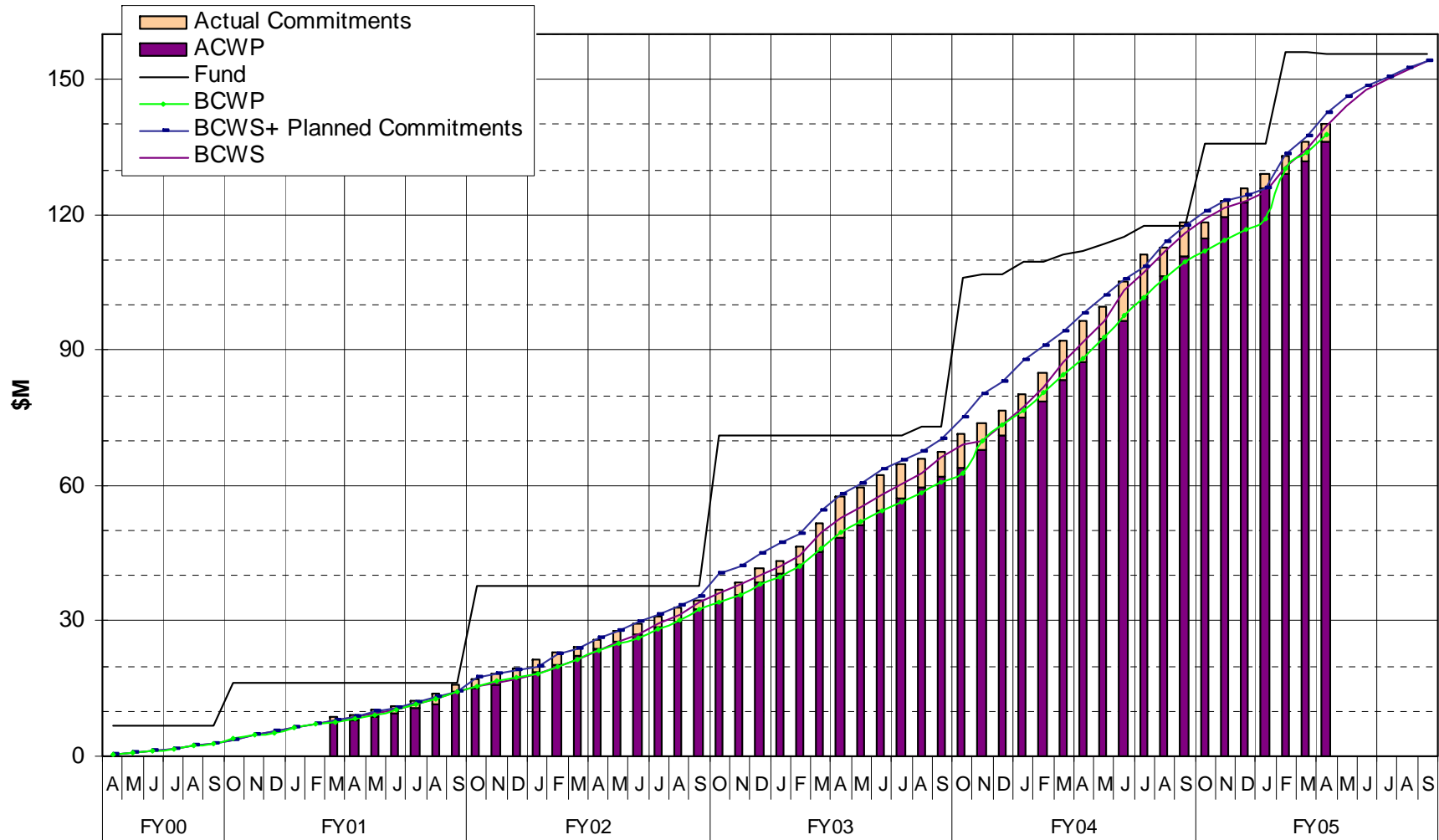
Cpi_Fcst: CPI (to date) EAC Forecast = BAC / CPI
 CpiSpi_Fcst: Combination CPI and SPI EAC Forecast = ACWP + (BAC - BCWP) / (CPI * SPI)

■	Worse than .85	■	Between .95 and 1.10
■	Between .85 and .95	■	Better than 1.10

SPI and CPI Change Thresholds



Budget, Cost, Funding, Performance





Cost Report

Reporting Category	Cost Incurred				Estimated Cost			4/3/2000	Unfilled Orders Outstanding	
	During Month		Cum. to Date		Detail		Balance of Contract	Estimated Final Cost		
	Actual	Planned	Actual	Planned	MAY05	JUN05		Contractor Estimate	Contract Value	
4.1.1 INSTRUMENT MANAGEMENT	201	327	15,833	16,129	327	342	1,143	17,645	17,645	151
4.1.2 SYSTEM ENGINEERING	174	181	6,808	6,884	166	163	510	7,647	7,647	364
4.1.4 TRACKER	597	819	18,731	19,175	983	768	1,220	21,702	21,702	1,585
4.1.5 CALORIMETER	406	495	20,979	21,557	275	226	1,115	22,594	22,594	67
4.1.6 ANTICOINCIDENCE DETECTOR	523	649	16,918	17,183	363	216	471	17,968	17,968	122
4.1.7 ELECTRONICS	804	961	25,551	25,958	1,137	767	1,440	28,894	28,894	961
4.1.8 MECHANICAL SYSTEMS	1,081	653	14,651	15,178	613	406	1,195	16,866	16,866	298
4.1.9 INTEGRATION & TEST	290	486	7,214	7,531	327	314	1,596	9,451	9,451	19
4.1.A PERFORMANCE AND SAFETY ASSURANCE	176	179	3,320	3,374	103	111	312	3,846	3,846	1
4.1.B LAT INSTRUMENT SCIENCE OPERATIONS	2	5	306	312	5	5	18	334	334	0
4.1.C EDUCATION AND PUBLIC OUTREACH	103	98	2,066	2,329	70	73	476	2,684	2,684	93
4.1.D SCIENCE ANALYSIS SOFTWARE	68	77	2,532	2,690	75	80	382	3,069	3,069	177
4.1.E SUBORBITAL FLIGHT TEST	0	0	1,325	1,325	0	0	0	1,325	1,325	0
Gen. and Admin.	0	0	0	0	0	0	0	0	0	
Total	4,425	4,931	136,232	139,624	4,444	3,471	9,878	154,025	154,025	3,838