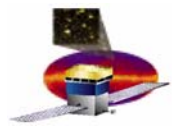


## **Project Status**

**January 26, 2006**

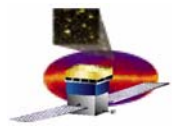
**Lowell A. Klaisner**  
**Project Manager**  
[klaisner@slac.stanford.edu](mailto:klaisner@slac.stanford.edu)  
**650-926-2726**



# Project Status (1 of 2)

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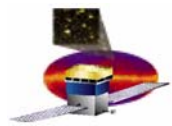
- **Completed Phase 0 testing**
  - **Scheduled 140 hours of testing actually took 414 hours**
    - **Longest single NCR resolution was tower 8 asserting busy unexpectedly – now resolved**
    - **There were bugs in scripts and databases**
  - **Learned a lot about the instrument, scripts, and calibration strategies**
  - **Complete on last month's schedule by working 24/7**
- **Currently, commissioning and verifying the EGSE and associated software**
  - **Power Rack**
  - **Control Rack (VSC)**
  - **Mobile Computing Rack**
- **Then commission the SIUs and EPUs**
- **We are ready to begin Phase 1 as soon as this is completed**
  - **FSW, LICOS, scripts are available for the initial Phase 1 testing**
  - **Concurrent development will be needed to complete Phase 1**



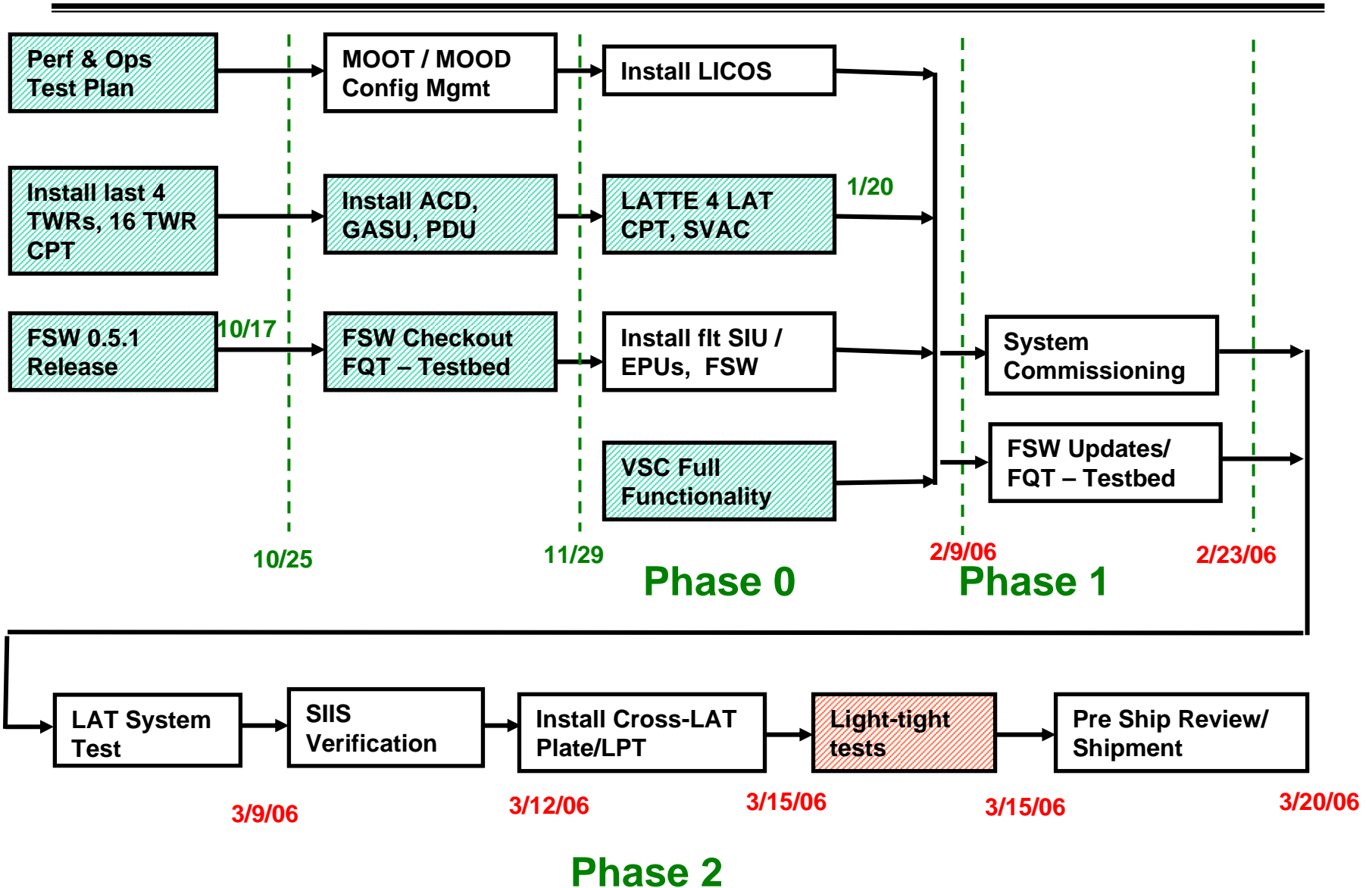
# Project Status (2of2)

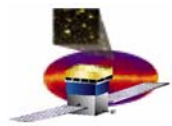
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- **Open issues**
  - EPU Programming
  - LICOS Script development
  - Spare RAD 750 failure
- **Flight Software**
  - 6.1 loaded on SIUs – Initial operation
  - 6.2 January 27 – Science runs, muon data
  - 6.3 February 10 – Run for the record sans GBM and GRB
  - 7.0 adds GBM and GRB interfaces
- **Priorities**
  1. Operation on 1 SIU with FSW, LICOS, and test EGSE
  2. Operation with full complement of SIUs and EPUs
  3. Run for the record
  4. Clean up and ship to NRL



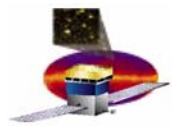
# System Test Flow



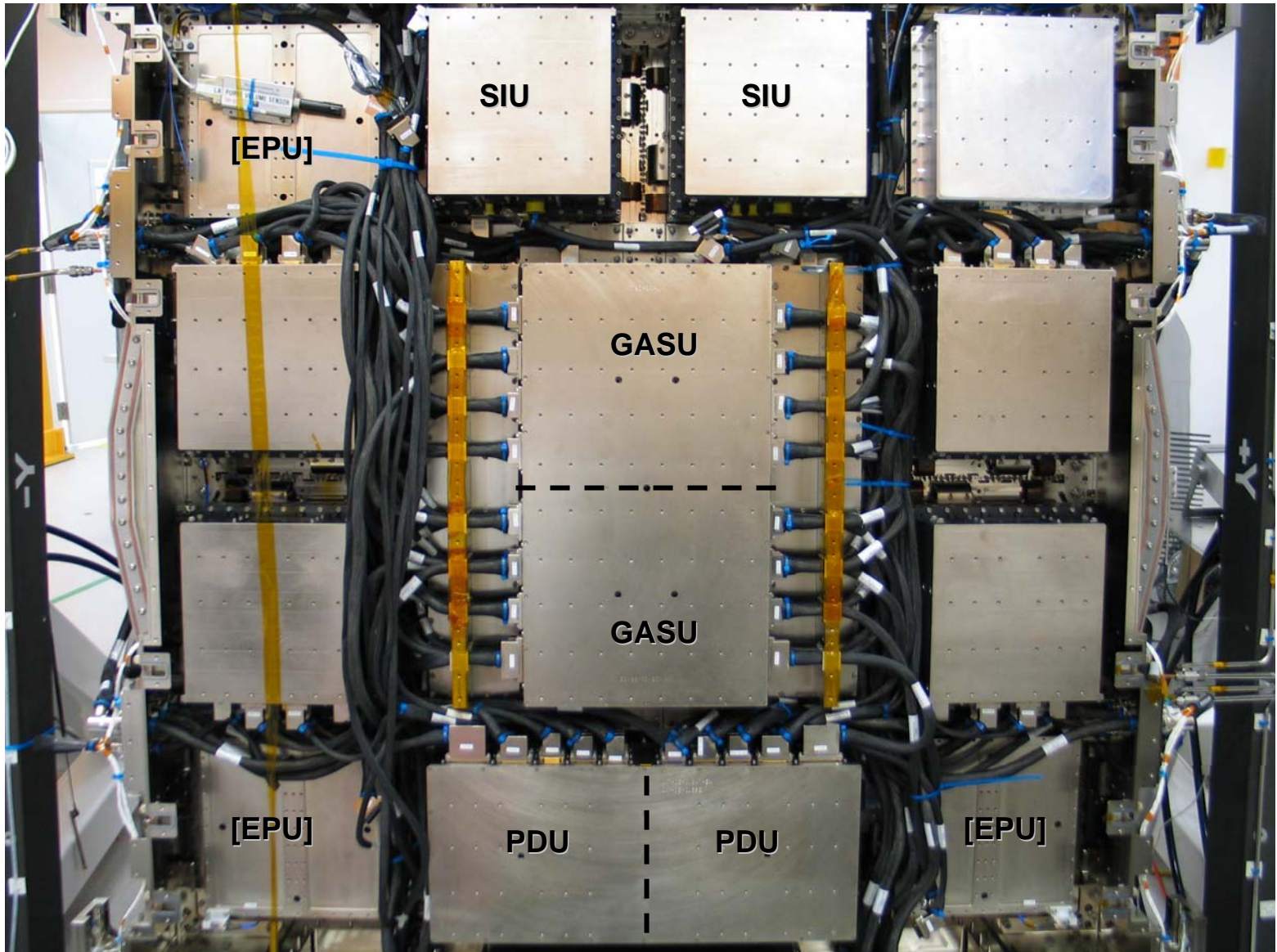


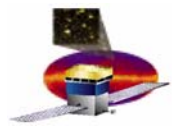
# Phase 0 testing

Series	Test	Purpose	P/F	Notes	Planned	Actual
LAT CPT	STR19	AEM/ACD Clock Phase Bit Test	pass	primary side only		
LAT CPT	GASU register test	Check for GASU errors	pass	NCR783 (redun., TEM 8 not reset), NCR785 (GEM cr_stat)		
LAT CPT	register test - redundant GASU/PDU	Check for TEM errors	pass	NCR529 (TEM [9] TCC [2] TRC [8] TFE [23] mask readback)		
LAT CPT	register test - primary GASU/PDU	Check for TEM errors	pass	NCR529 (TEM [9] TCC [2] TRC [8] TFE [23] mask readback)		
LAT CPT	ACD CPT	Baseline LAT CPT	pass	NCR787 (schema reload), NCR788 (AEM temp)		
				NCR791 (TEMs all on/off), NCR793 (ACD telemetry calib)		
				NCR795 (linearity fits), NCR796 (GARC0/GAFE11 gain)		
				NCR797 (GARC8 schema typo)		
LAT CPT	LAT CPT - TKR Section	Baseline LAT CPT	pass	NCR789 (bad chan. not read in); NCR700 (new hot chan.)		
LAT CPT	LAT CPT - CAL Section	Baseline LAT CPT	pass		36	116
NCR	NCR783 Dispositions	Resolve NCR783 (redund. TEM8 reset)		*requires breaking configuration to complete	0	30
Trigger	ACD Channel Uniformity	Check ROI and CNO arrival times with CI	pass	NCR800 (TEM errors, hot ACD channel)		
Trigger	ACD Hitmap Latching	Optimize hitmap latch delay and stretch	pass			
Trigger	ACD CI Circuit Retriggering	Verify ACD CI circuit behavior (NCR706)	pass			
Trigger	CAL Channel Uniformity	CAL-LO and CAL-HI arrival times with CI	pass			
Trigger	CAL FLE Muon Scan	FLE threshold and trigger mask for timing	pass	ran both Byron and Lester's versions; needed script mods		
Trigger	ACD TREQ with ext trigger	ACD ROI arrival times w/ muon tel. trig.	pass			
Trigger	ACD Trigger Rate Test	Optimize ROI trig. for CAL/TKR TREQ test	pass			
Trigger	CAL, TKR TREQ Alignment	CAL-LO, TKR arrival times w/ ROI trig.	pass	NCR804 (error in algorithm)		
Trigger	ACD TREQ with TKR trigger	ACD ROI arrival times w/ TKR trig.	pass			
Trigger	ACD, CAL, TKR TACK Scan	Optimize TACK for all three subsystems	pass	unplanned online/offline analysis; needed script mods		
Trigger	Trigger Efficiency	Trig eff. study for all three subsystems	pass			
Trigger	ACD Veto Mode Run	Cosmics run w/ CAL-LO    (TKR && !ROI)	pass		48	130
CALIB	CalibDac (CAL discriminator scans)	CAL thresholds calibration	pass			
CALIB	CalibGen (CAL charge injection scan)	CAL ADC calibration	pass			
CALIB	MuTrig (CAL muon data)	CAL energy calibration	pass	export directory was not optimized correctly		
CALIB	CAL Subsystem Offline Analysis	update of threshold configurations	pass	threshold errors and delivery file format incompatibilities		
CALIB	TE601 (TKR threshold scan)	TKR threshold calibration	pass			
CALIB	TE602 (TKR full range charge inj. scan)	TKR TOT calibration	pass			
CALIB	TE604 (TKR charge scan at threshold)	TKR threshold dispersion	pass		22	75
TKR perf.	TE702 (TKR trigger jitter)	tracker performance test	pass		4	0
SVAC	e2e B-2, B-10, B-13 (1 minute ea.)	Configuration Validation	pass	NCR806 (B-10 CAL retrigger); use B-30 instead of B-10		
SVAC	e2e B-13 (15 min)	SVAC data collection	pass			
SVAC	e2e B-30 (15 hours)	SVAC data collection	pass	more overhead than expected; export error; NCR458		
SVAC	e2e B-2 (4 hours)	SVAC data collection	pass	more overhead than expected	30	63
<b>Totals</b>					<b>140</b>	<b>414</b>

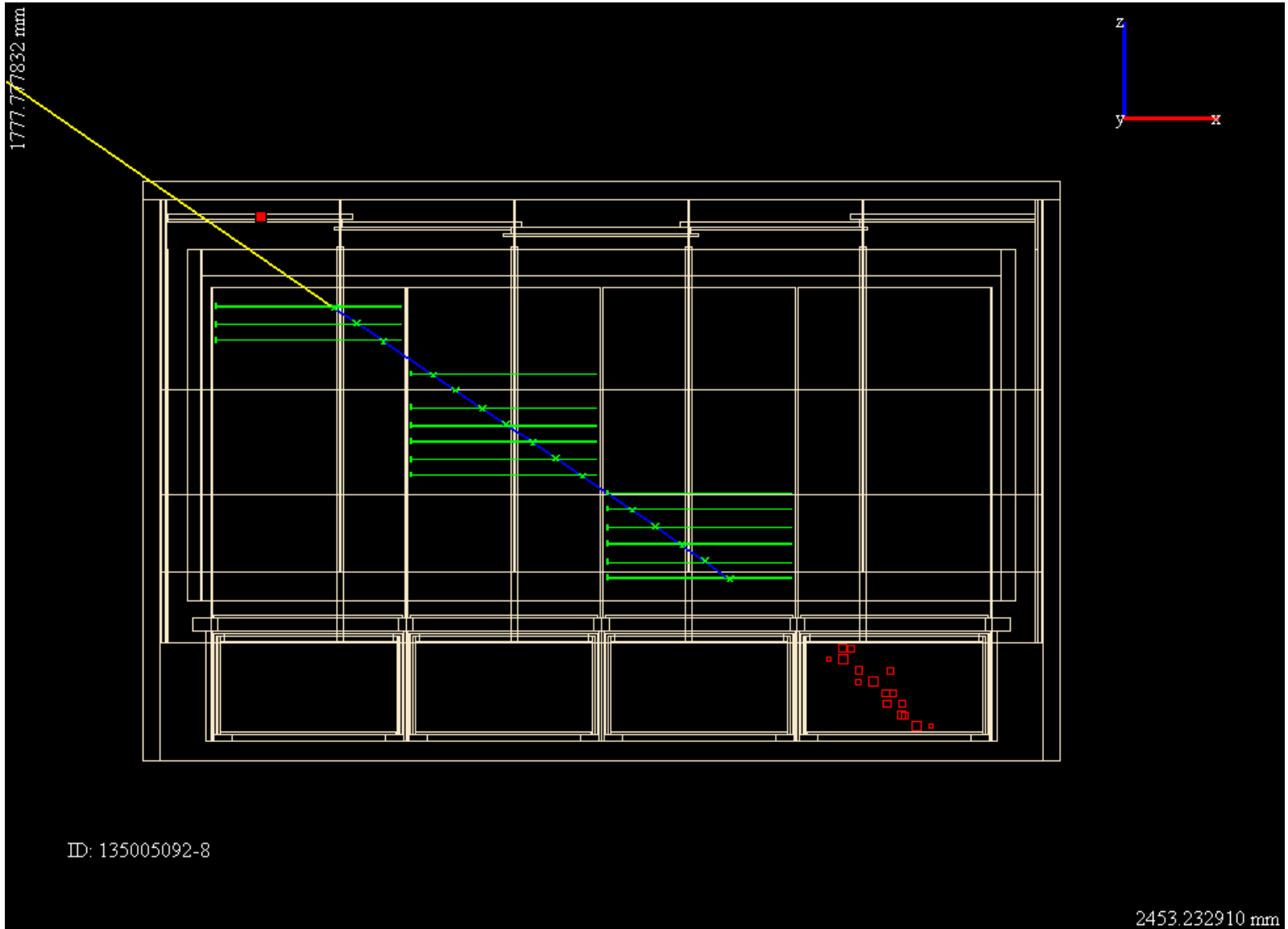


# Data Acquisition System



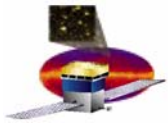


# 16 Towers with ACD



ID: 135005092-8

2453.232910 mm

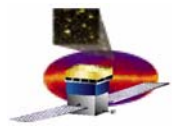


# Level 1-2 Milestone List

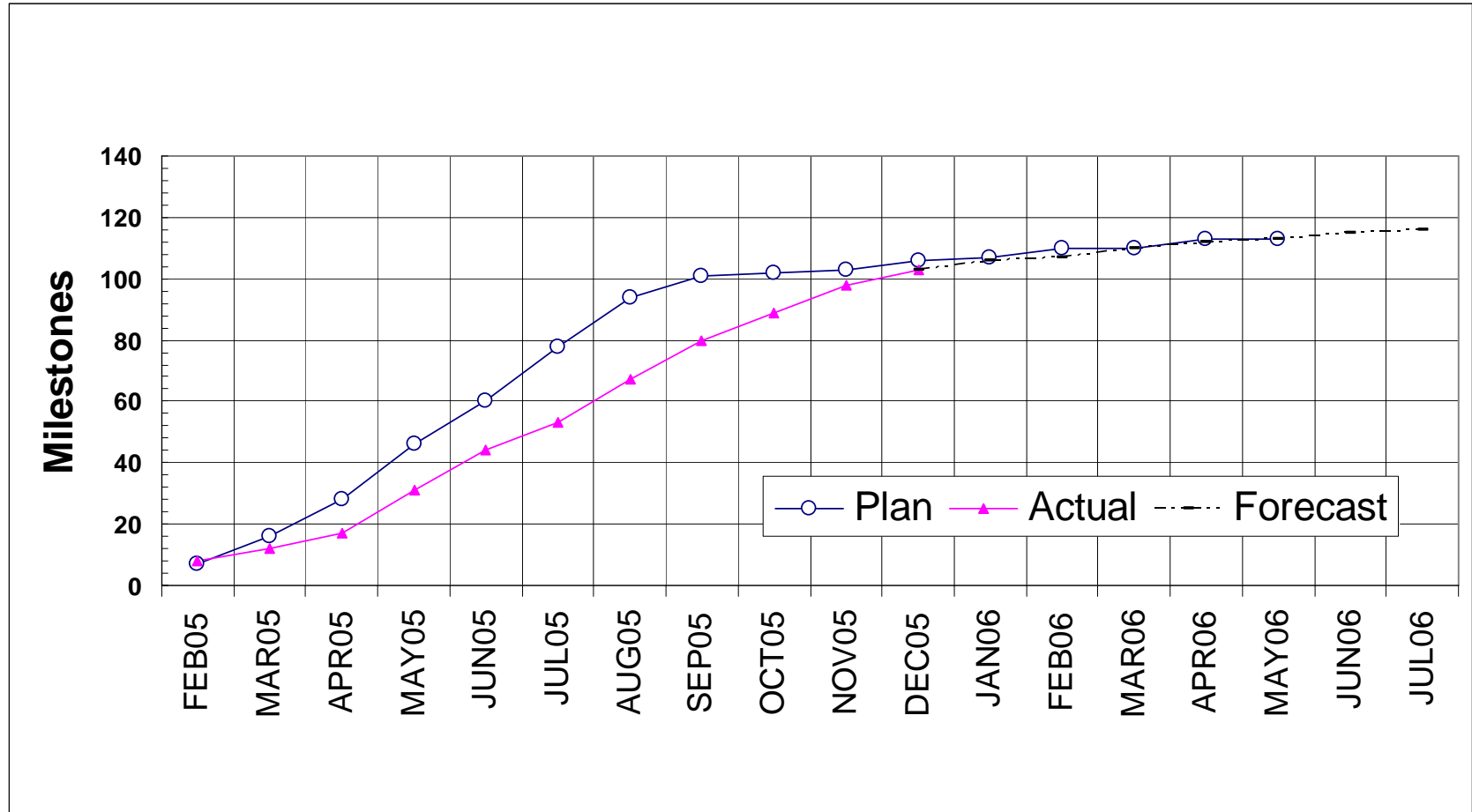
Activity ID	Activity Description	Baseline Finish	-2mo Var	-1mo Var	Bslin Var	Early Finish	Fiscal Year / Quarter Grid																															
							FY00 Q4	FY00 Q1	FY01 Q2	FY01 Q3	FY01 Q4	FY02 Q1	FY02 Q2	FY02 Q3	FY02 Q4	FY03 Q1	FY03 Q2	FY03 Q3	FY03 Q4	FY04 Q1	FY04 Q2	FY04 Q3	FY04 Q4	FY05 Q1	FY05 Q2	FY05 Q3	FY05 Q4	FY06 Q1	FY06 Q2	FY06 Q3	FY06 Q4							
1 4.1.1 INSTRUMENT MANAGEMENT																																						
1 DOE/NASA Joint Oversight Group (Level 1)																																						
1M1P00000C	DOE Critical Decision (CD) 0 Approva	06/25/01A	0	0	0	06/25/01A				▼																												
1M1P00001C	CD-1 Approval	07/23/02A	0	0	0	07/23/02A							▼																									
1M1P00002C	CD-2 Approval	11/08/02A	0	0	0	11/08/02A								▼																								
1M1P00003C	CD-3 Approval	09/03/03A	0	0	0	09/03/03A									▼																							
1M1P00006C	Flight GRID Complete	11/08/04A	0	0	0	11/08/04A																				▼												
1M1P00004C	CD-4 Approval	03/15/06*	0	0	0	03/15/06*																																
2 DOE/NASA Federal Project Managers (Level 2)																																						
1M1BF00000	Launch Balloon Flight	08/01/01A	0	0	0	08/01/01A				▼																												
1M1000100	Instrument Preliminary Design Review	01/08/02A	0	0	0	01/08/02A						▼																										
1M1000110	I-CDR (Critical Design Review)	05/16/03A	0	0	0	05/16/03A								▼																								
1M1000740	Start LAT Integration	03/23/05	-5	-5	-5	03/30/05A																																
1M1000700	Pre Environmental Testing Review	12/20/05	-15	-23	-50	03/10/06																						▼										
1M1000120	PSR-(Instrument Pre-Ship Review)	04/18/06	-25	-28	-52	06/30/06																																

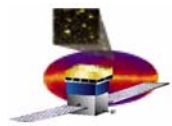
**DOE ESSAB review for CD-4 is scheduled for February 2, 2006**



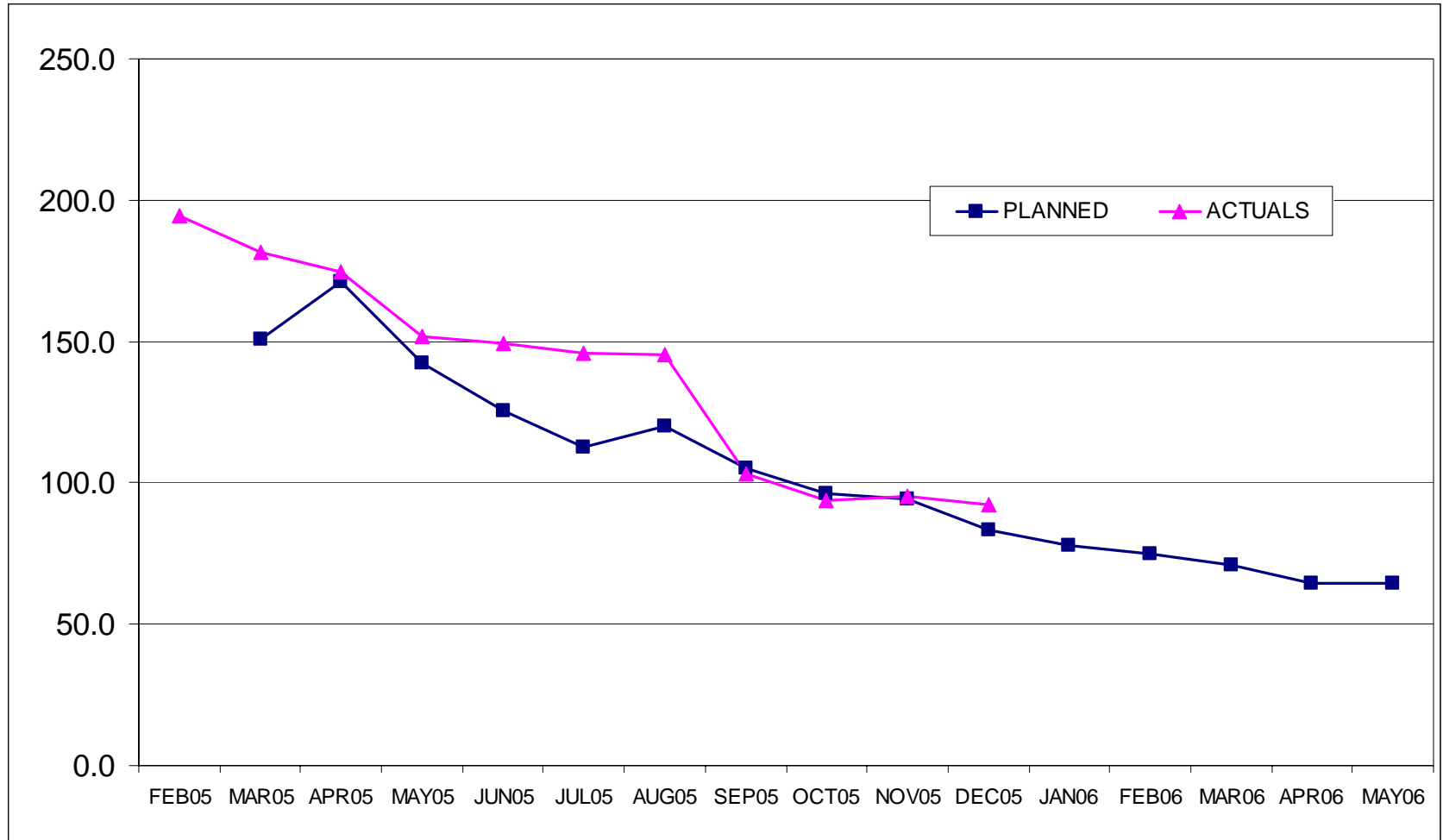


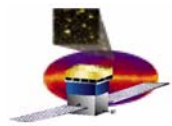
# Level 3 Milestone Count





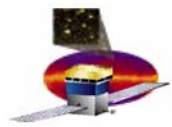
# FTE Report (DOE/NASA-funded only)





# Cost Report

Monthly Contractor Financial Management Report 31-Dec-05					NASA form 533M Approved OMB # 2700-001			Report for Month Ending: 12/31/2005			
To:				From:				Contract Value			
								Cost:	0	Fee:	0
LAT4		Type:			Contract Number and Latest Definitized Amendment No:			Fund Limitation:		0	
LAT								Billing			
								Invoiced amts bill		Total Pyts rec'd	
Reporting Category	Cost Incurred/Hours Worked				Estimated Cost/Hours to Complete			4/3/2000 Estimated Final Cost/Hours		Unfilled Orders Outstanding	
	During Month		Cum. to Date		Detail		Balance of Contract	Contractor Estimate	Contract Value		
	Actual	Planned	Actual	Planned	JAN06	FEB06					
4.1.1 INSTRUMENT MANAGEMENT	300	348	18,442	18,931	453	401	7,360	26,656	26,656	153	
4.1.2 SYSTEM ENGINEERING	286	120	8,882	8,739	176	157	1,360	10,575	10,575	0	
4.1.4 TRACKER	17	0	21,383	21,366	0	120	-17	21,486	21,486	167	
4.1.5 CALORIMETER	0	0	21,553	21,554	0	0	2	21,554	21,554	0	
4.1.6 ANTICOINCIDENCE DETECTOR	0	0	18,165	18,329	0	0	164	18,329	18,329	123	
4.1.7 ELECTRONICS	544	149	30,099	30,355	98	98	1,840	32,135	32,135	170	
4.1.8 MECHANICAL SYSTEMS	98	33	17,329	17,516	39	36	880	18,284	18,284	32	
4.1.9 INTEGRATION & TEST	360	302	9,628	10,699	415	523	3,451	14,018	14,018	161	
4.1.A PERFORMANCE AND SAFETY ASSURANCE	25	75	4,173	4,187	112	106	1,063	5,452	5,452	0	
4.1.B LAT INSTRUMENT SCIENCE OPERATIONS CENTER	0	0	317	317	0	0	0	317	317	0	
4.1.C EDUCATION AND PUBLIC OUTREACH	3	44	2,459	2,831	52	49	1,427	3,988	3,988	173	
4.1.D SCIENCE ANALYSIS SOFTWARE	61	68	3,116	3,165	80	76	1,841	5,114	5,114	4	
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	0	
<b>Total</b>	<b>1,695</b>	<b>1,140</b>	<b>156,869</b>	<b>159,314</b>	<b>1,425</b>	<b>1,567</b>	<b>19,372</b>	<b>179,233</b>	<b>179,233</b>	<b>983</b>	



# Performance Analysis

	WBS	BAC	BCWS	BCWP	ACWP	SV \$	CV \$	% BCWS	% BCWP	% ACWP	SPI Trend	CPI Trend	SPI	CPI	CPI Fcst	CpiSpi Fcst
1	4.1	179,233	159,314	158,639	156,869	-675	1,770	88.89	88.51	87.52	↑	↔	0.996	1.011	177,233	177,319
2	4.1.1	26,656	18,931	18,931	18,442	0	489	71.02	71.02	69.18	↔	↔	1.000	1.027	25,967	25,967
3	4.1.2	10,575	8,739	8,739	8,882	0	-143	82.63	82.63	83.99	↔	↓	1.000	0.984	10,748	10,748
4	4.1.4	21,486	21,366	21,366	21,383	0	-17	99.44	99.44	99.52	↔	↓	1.000	0.999	21,503	21,503
5	4.1.5	21,554	21,554	21,554	21,553	0	2	100.00	100.00	99.99	↔	↔	1.000	1.000	21,553	21,553
6	4.1.6	18,329	18,329	18,329	18,165	0	164	100.00	100.00	99.11	↔	↔	1.000	1.009	18,165	18,165
7	4.1.7	32,135	30,355	30,229	30,099	-126	130	94.46	94.07	93.66	↑	↓	0.996	1.004	31,997	32,005
8	4.1.8	18,284	17,516	17,477	17,329	-39	149	95.80	95.59	94.78	↑	↑	0.998	1.009	18,128	18,130
9	4.1.9	14,018	10,699	10,189	9,628	-510	561	76.33	72.69	68.68	↑	↔	0.952	1.058	13,246	13,427
10	4.1.A	5,452	4,187	4,187	4,173	0	15	76.80	76.80	76.53	↔	↑	1.000	1.004	5,433	5,433
11	4.1.B	317	317	317	317	0	0	100.00	100.00	99.92	↑	↑	1.000	1.001	317	317
12	4.1.C	3,988	2,831	2,831	2,459	0	371	70.98	70.98	61.67	↔	↑	1.000	1.151	3,465	3,465
13	4.1.D	5,114	3,165	3,165	3,116	0	49	61.90	61.90	60.94	↔	↑	1.000	1.016	5,034	5,034
14	4.1.E	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)

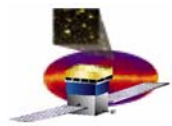
SV \$: Schedule Variance = BCWP - BCWS  
 CV \$: Cost Variance = BCWP - ACWP  
 SPI: Schedule Performance Index = BCWP/BCWS  
 CPI: Cost Performance Index = BCWP/ACWP

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

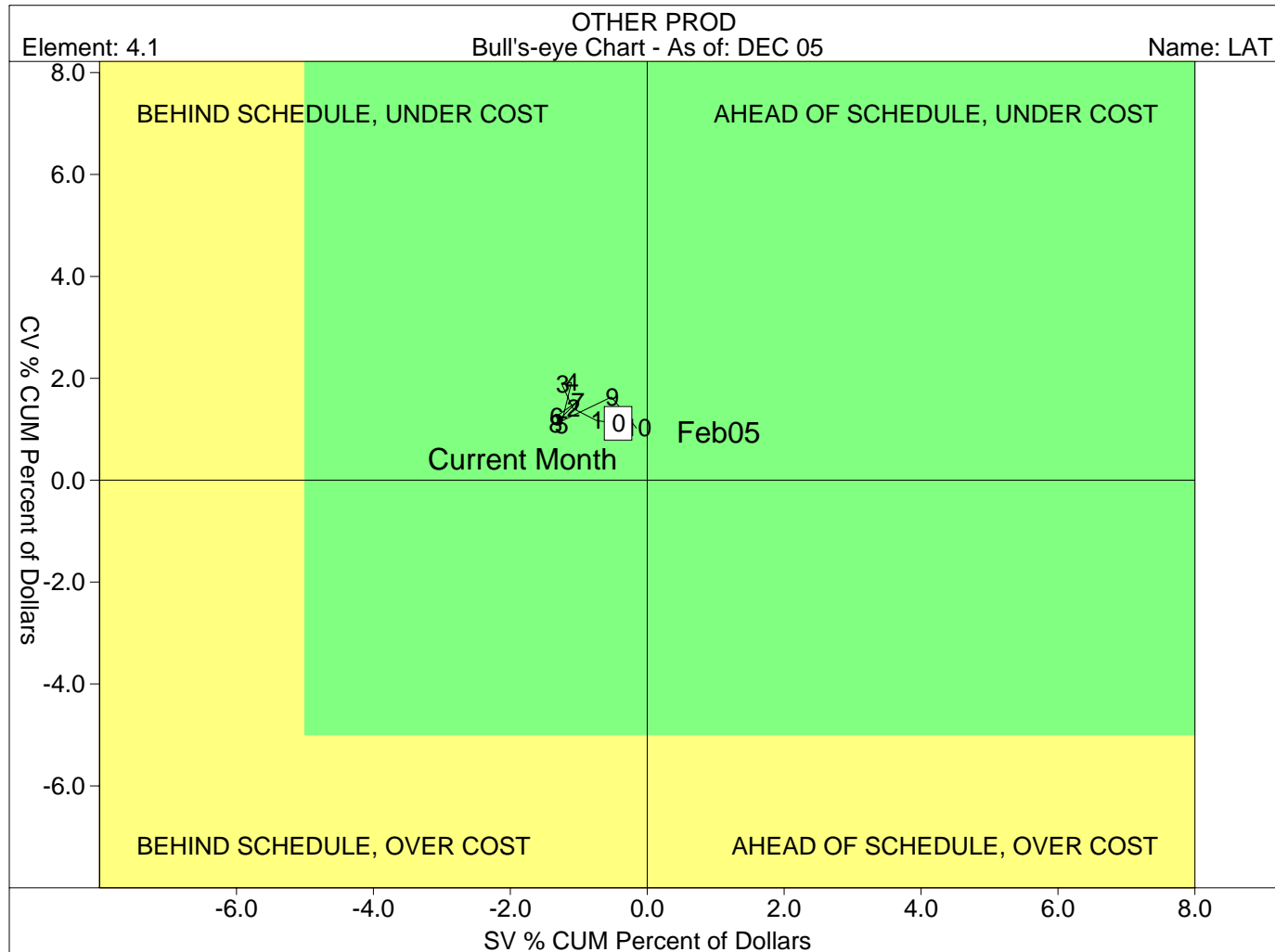
Cpi\_Fcst: CPI (to date) EAC Forecast = BAC / CPI  
 CpiSpi\_Fcst: Combination CPI and SPI EAC Forecast = ACWP + (BAC - BCWP) / (CPI \* SPI)

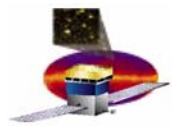
<span style="color: red;">█</span>	Worse than .85	<span style="color: green;">█</span>	Between .95 and 1.10
<span style="color: yellow;">█</span>	Between .85 and .95	<span style="color: blue;">█</span>	Better than 1.10

SPI and CPI Change Thresholds



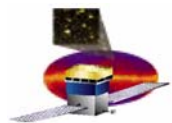
# Variance Analysis



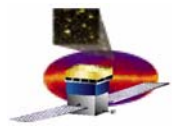


# Liens List

		FY06	FY07	FY08	TOTAL
4.1.2 Systems Engineering	Subcontract rate increase	\$105	\$105		\$210
	Additional subcontract manpower	\$255			\$255
<b>4.1.2 TOTAL</b>		<b>\$360</b>	<b>\$105</b>	<b>\$0</b>	<b>\$465</b>
4.1.9 I&T	Subcontract rate increase	\$50	\$50		\$100
<b>4.1.9 TOTAL</b>		<b>\$50</b>	<b>\$50</b>		<b>\$100</b>
4.1.A PSA	Extend QA support	\$256			\$256
<b>4.1.A TOTAL</b>					<b>\$256</b>
<b>TOTAL</b>		<b>\$410</b>	<b>\$155</b>	<b>\$0</b>	<b>\$821</b>
<b>Available Contingency</b>		<b>\$6,019</b>	<b>\$2,668</b>	<b>\$115</b>	<b>\$8,802</b>
<b>NOTES:</b>					
<b>Schedule delays cost ~\$700K per month</b>					
<b>GSFC Underrun:</b>					
	4.1.1 Mgmt	\$292			
	4.1.6 ACD	\$162	(\$123K still committed)		
	4.1.D SAS	-\$74			



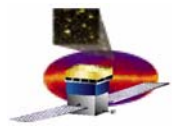
# Backup Material



# CPR Level 3

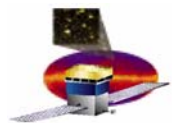
Cost Performance Report - Work Breakdown Structure														
Contractor: Location:						Contract Type/No:			Project Name/No: LAT		Report Period: 11/30/2005 12/31/2005			
Quantity 1		Negotiated Cost 0		Est. Cost Authorized Unpriced Work 0		Tgt. Profit/ Fee % 0 0.00		Tgt. Price 0	Est Price 0	Share Ratio	Contract Ceiling 0	Estimated Contract Ceiling 0		
CAPW[3]  Item (1)		Current Period					Cumulative to Date					At Completion		
		Budgeted Cost		Actual Cost Work	Variance		Budgeted Cost		Actual Cost Work	Variance		Budgeted	Latest Revised Estimate	Variance
		Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost			
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)		
4.1.1 INSTRUMENT MANAGEMENT		348	348	300	0	48	18,931	18,931	18,442	0	489	26,656	26,656	0
4.1.2 SYSTEM ENGINEERING		120	120	286	0	-166	8,739	8,739	8,882	0	-143	10,575	10,575	0
4.1.4 TRACKER		0	0	17	0	-17	21,366	21,366	21,383	0	-17	21,486	21,486	0
4.1.5 CALORIMETER		0	0	0	0	0	21,554	21,554	21,553	0	2	21,554	21,554	0
4.1.6 ANTICOINCIDENCE DETECTOR		0	0	0	0	0	18,329	18,329	18,165	0	164	18,329	18,329	0
4.1.7 ELECTRONICS		149	405	544	257	-139	30,355	30,229	30,099	-126	130	32,135	32,135	0
4.1.8 MECHANICAL SYSTEMS		33	152	98	119	54	17,516	17,477	17,329	-39	149	18,284	18,284	0
4.1.9 INTEGRATION & TEST		302	418	360	116	58	10,699	10,189	9,628	-510	561	14,018	14,018	0
4.1.A PERFORMANCE AND SAFETY ASSURANCE		75	75	25	0	50	4,187	4,187	4,173	0	15	5,452	5,452	0
4.1.B LAT INSTRUMENT SCIENCE OPERATIONS CENTER		0	0	0	0	0	317	317	317	0	0	317	317	0
4.1.C EDUCATION AND PUBLIC OUTREACH		44	44	3	0	41	2,831	2,831	2,459	0	<b>371</b>	3,988	3,988	0
4.1.D SCIENCE ANALYSIS SOFTWARE		68	68	61	0	7	3,165	3,165	3,116	0	49	5,114	5,114	0
4.1.E SUBORBITAL FLIGHT TEST		0	0	0	0	0	1,325	1,325	1,325	0	0	1,325	1,325	0
Gen. and Admin.		0	0	0	0	0	0	0	0	0	0	0	0	0
Undist. Budget												0	0	0
Sub Total		1,140	1,631	1,695	491	-64	159,314	158,639	156,869	-675	1,770	179,233	179,233	0
Contingency												8,822	8,822	0
Total		1,140	1,631	1,695	491	-64	159,314	158,639	156,869	-675	1,770	188,055	188,055	0





# Level 3 Milestones Completed in December 2005

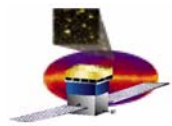
AV	Activity ID	ND	Activity Description	Baseline Finish	Bsn Var	Early Finish	FY06		
							NOV	DEC	JAN
<b>Instrument Project Office (Level 3)</b>									
<b>4.1.4 Tracker</b>									
4	1M1000311	9	Flight Tracker Tower 16 RFI	09/22/05	-49	12/02/05A	▼		
<b>4.1.7 Electronics</b>									
7	1M7941070	9	Flight GASU Box-Elec to I&T	07/19/05	-95	12/02/05A	▼		
7	1M7941080	9	5th Flight EPU/SIU-Elec to I&T	09/02/05	-102	12/14/05A		▼	
7	1M79540		FQT Scripts Complete - Phase 1	08/30/05	-75	12/16/05A		▼	
7	1M79560		FQT Complete - Phase 1	09/15/05	-64	12/16/05A		▼	
Run Date	01/25/06 09:47		<b>GLAST LAT PROJECT</b>				LT-TB: Completed Level 3 by Subsystem		
Data Date	01/01/06		<b>Completed Level 3 Milestones</b>				FL-TB: Level 3 Milestones compl. last month		
© Primavera Systems, Inc.			<b>in Reporting Month</b>				Sheet 1		
			<b>Sort by Subsystem</b>						



# Level 3 Milestones Completed in January 2005

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None Completed



# Budget, Cost, Funding, Performance

