

GLAST Large Area Telescope: I & T Input to Monthly Technical/Cost/Schedule Review 09/27/05

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Last Month's Accomplishments (1 of 3)

- **Management**
 - **Supporting Environmental Test Planning**
 - Environmental Test Implementation Plan Draft out for Review
 - **Tracking hardware shortages for LAT integration.**
 - TKR Delivery
 - ELX Boxes
- **IFCT**
 - **Completed 8 Tower Tests**
 - **Integrated two additional towers (10 towers in grid)**
 - **Completed receiving tests for remaining flight TEM/TPS.**
 - **Completed Test Interface Plate (TIP) to S/C flexure assembly for Proof test and SLT**



Last Month's Accomplishments (2 of 3)

- **SVAC**
 - **Preparing for full LAT tests**
 - Supporting test definition
 - Continued work on infrastructure for LAT data analysis
 - Provided support for Online and Offline in preparation for receiving LAT data
 - Documenting analysis of previous data

- **Environmental Test**
 - **LAT-MD-01600 TVAC test plan released**
 - **LAT-MD-01196 Dynamics and LAT-MD-02726 EMI test plan in signature cycle**
 - **LAT-DS-06898 LAT Env. Test Implementation Plan Draft out for review.**
 - **TVAC chamber mods have been identified and are being analyzed.**
 - **New rail supports in chamber**
 - **New TVAC trolley**

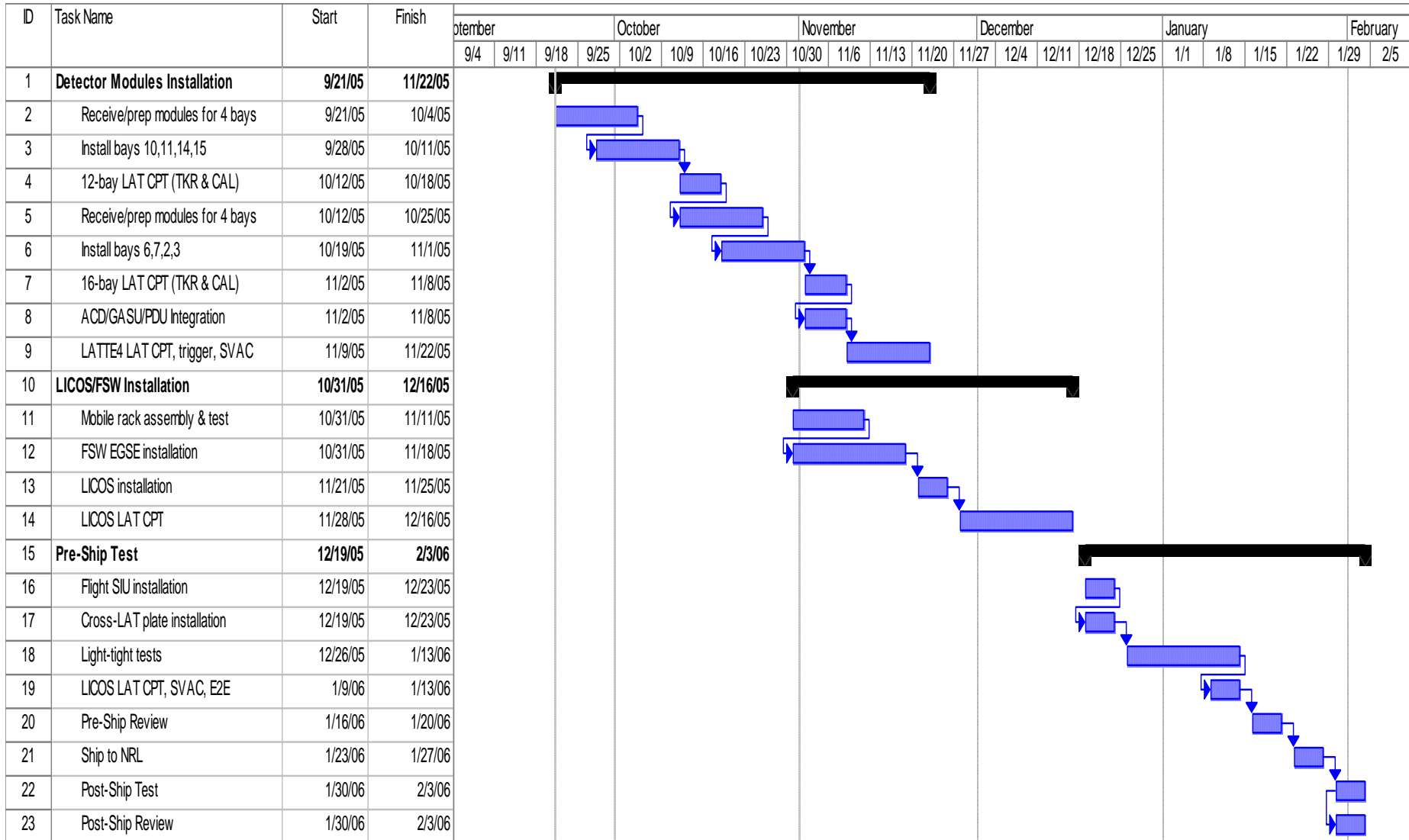


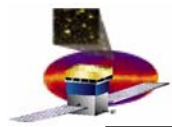
Last Month's Accomplishments (3 of 3)

- **Environmental Test (Cont'd)**
 - **NRL shipping container mods identified by NRL**
 - Fabricating new shipping container base
 - **Pathfinding Operations Identified**
 - Pathfinding planned for Dec 05 at NRL
 - Draft of pathfinding plan in work
 - **Test Stand**
 - Supplier selected and under contract
 - MRR planned for first week in October
 - Final drawings in release



I&T Summary Plan





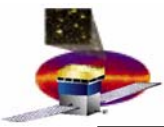
Online Plan

- **Online “to go” plan for LICOS development to support full LAT test**

LICOS Function	ECD
Commanding via LICOS	10/1/2005
TLM monitoring	10/1/2005
Power-on Demonstration	10/15/2005
LCI script functional demonstration (no data for analysis)	10/15/2005
LCI script with data analysis capability	11/15/2005
Muon analysis capability (requires decompression format definition below)	12/1/2005?
LICOS full LAT test capability demonstration	1/9/2006

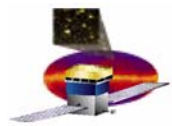
- **Interdependencies identified and in work with subsystems**

Task	Interdependency	
	From	To
LAT Performance and Ops Plan	Systems Engr.	Online
LAT Start-up Definition	Systems Engr.	Online
Decompression Format Definition	FSW (James, JJ)	Online
S/C Dataflow (reassembly, decompression to LDF file)	ELX (Mike H, Ric)	Online
Definition of Mobile Rack FSW install.	FSW	Online
FSW for LCI Script checkout	FSW	Online
MOOT API definition	ISOC	Online
LICOS impact on SVAC run data	Online	SVAC
SIIS to VSC validation	ELX (Mike Huffer)	I&T
SIIS to LAT verification	I&T	SE
VSC validation with mini-LAT	ELX (Mike Huffer)	I&T



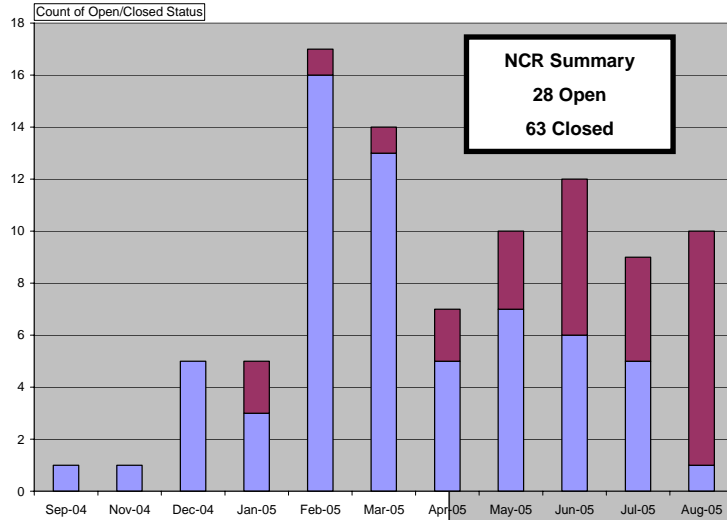
SVAC Plan

- **SVAC**
 - **Change in plans for the next Workshop**
 - Workshop 6 is postponed from Dec 2005 to Jan 2006
 - » Data Analysis of cosmic rays with full LAT and FSW
 - **Currently defining tests for the next 2 phases**
 - Phase 1 : full LAT tests with LATTE 4
 - » **Done**
 - Phase 2 : full LAT tests with FSW
 - » In preparation
 - **Generating MC for full LAT**
 - Data Analysis to prepare for final checkout tests
 - **Provide manpower to online to help create LDF within the FSW environment**
 - Will result in changes to the pipeline and SVAC scripts
 - **Trying to anticipate modifications due to the new configuration DB to be put in place soon**
 - Will result in changes to the pipeline and SVAC scripts

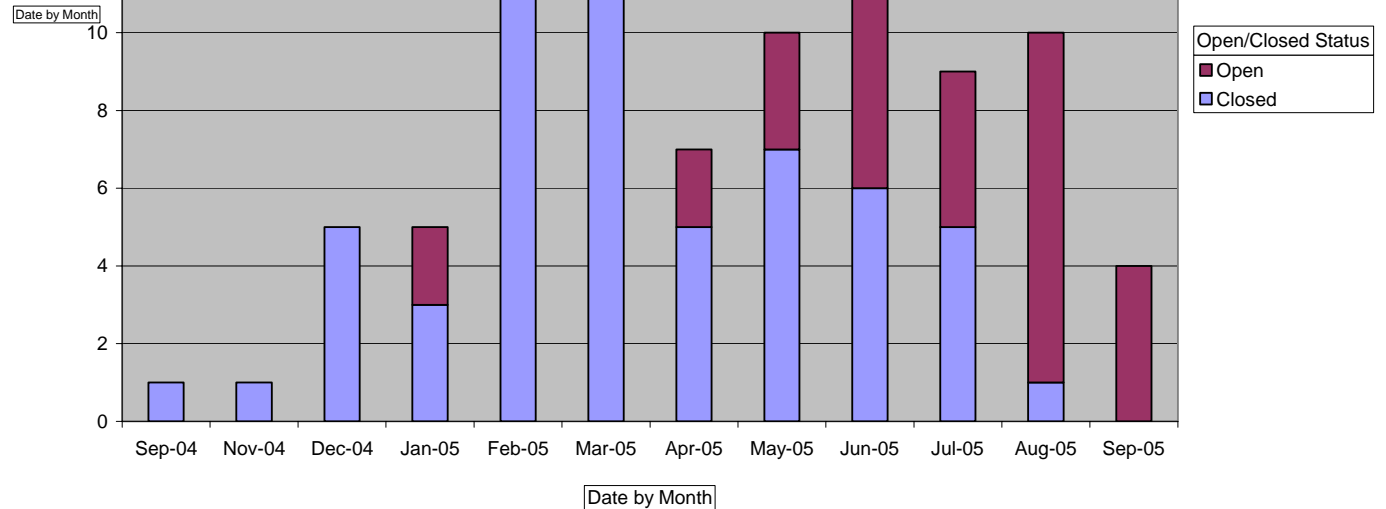


I&T NCRs by Month Open/Closed Status

Previous Month

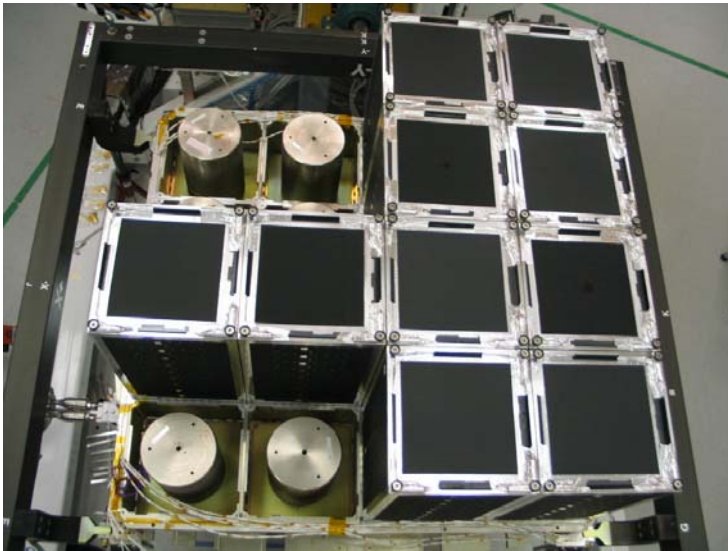
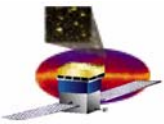


Current Status

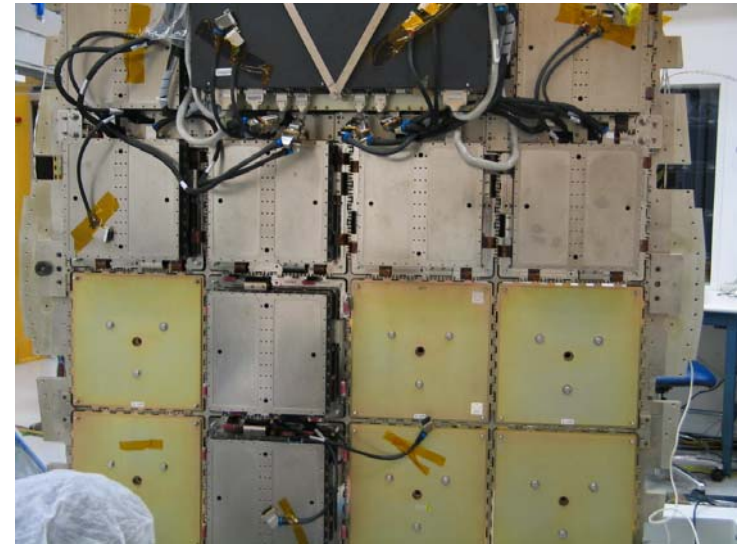


Month NCR Opened

I&T Activities



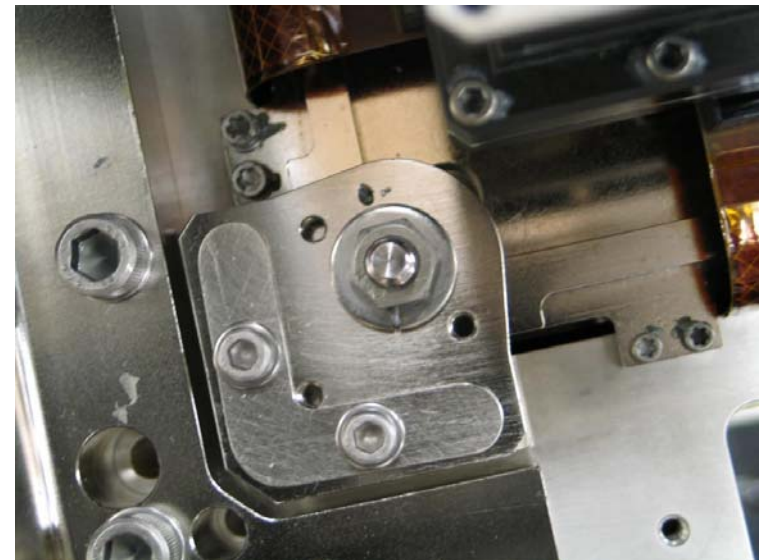
Ten towers in the grid (top view)



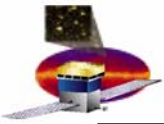
Ten towers in the grid (bottom view)



ACD lift fixture proof test
4.1.9 - Integration and Test

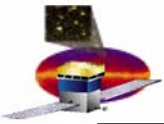


Shear Plate Installation



Upcoming I&T Events

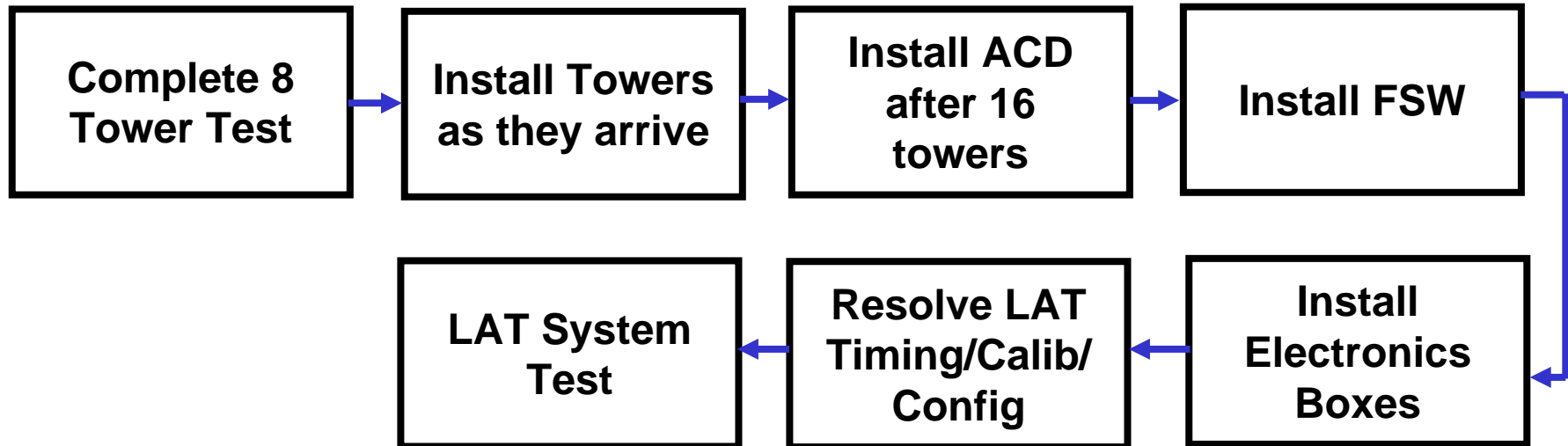
- ACD I&T Receiving Tests **(Complete)**
- Shear plate and cable tray installation for 8 towers **(Complete)**
- STR #35 CAL re-trigger characterization ECD 9/29
- TKR (2) Receiving **(Complete)**
- Complete 10 tower LPT's ECD 9/28
- Install and test 11th and 12th towers ECD 10/5
- Install and test 13th and 14th towers ECD 10/14
- Install and test 15th and 16th towers ECD 10/20
- Install test instrumentation (accels, T/C's) ECD 10/20
- Complete mechanical assembly (EMI skirt, downspout H/P's, bulkhead brackets, etc.) ECD 10/31
- Install and Test ACD ECD 11/9



ACD Integration Status

- I&T ACD Receiving tests **Complete**
- ACD lift fixture in work **Complete**
- Additional ACD off tests identified by ELX (STR 19) for ACD Clock Phase Bit Determination
- ACD with 8 Towers Test Plan **Complete**
- INT Scripts for ACD w/ 8 Towers **Complete**

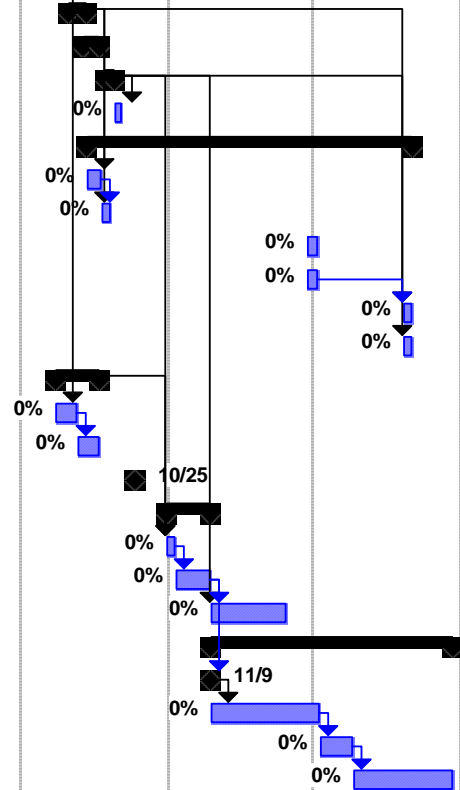
I&T Flow w/ ACD Integration at 16 Towers





I&T Detail Schedule (1 of 2)

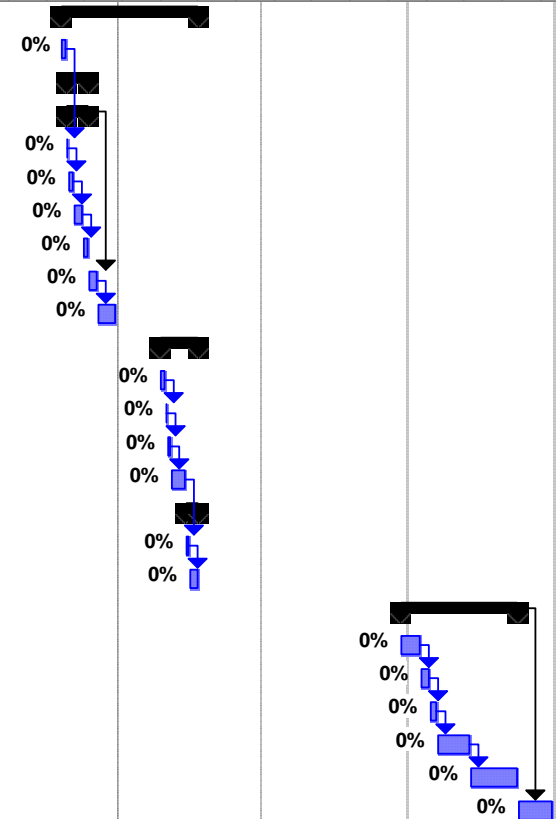
ID	Task Name	Duration	Start	Finish	August		September				October				November			December			January				February					
					6	14	22	30	7	15	23	1	9	17	25	2	10	18	26	4	12	20	28	5	13	21	29			
429	8 Tower Tests	10 days	8/5/05	8/19/05	[Gantt bar]																									
430	Install Bay 10 (Tower 7)	2 days	9/15/05	9/19/05	[Gantt bar]																									
435	Install Bay 11 (Tower 8)	2 days	9/19/05	9/21/05	[Gantt bar]																									
440	Install Bay 14 (Tower 9)	2 days	9/28/05	9/30/05	[Gantt bar]																									
445	Install Bay 15 (Tower 10)	2 days	10/3/05	10/5/05	[Gantt bar]																									
450	Install Bay 6 (Tower 11)	2 days	10/6/05	10/8/05	[Gantt bar]																									
455	Install Bay 7 (Tower 12)	3.88 days	10/10/05	10/14/05	[Gantt bar]																									
460	Install Bay 2 (Tower 13)	2 days	10/13/05	10/17/05	[Gantt bar]																									
465	Install Bay 3 (Tower 14)	2 days	10/18/05	10/20/05	[Gantt bar]																									
470	LAT Pre ACD Installation Optical Survey	1 day?	10/20/05	10/21/05	[Gantt bar]																									
471	Install Electronics and Cables	46.88 days	10/14/05	12/21/05	[Gantt bar]																									
472	Install GASU	1.5 days	10/14/05	10/17/05	[Gantt bar]																									
473	Install PDU	1.5 days	10/18/05	10/19/05	[Gantt bar]																									
474	Install first EPU	1.5 days	11/30/05	12/1/05	[Gantt bar]																									
475	Install first SIU	1.5 days	11/30/05	12/1/05	[Gantt bar]																									
476	Install Final EPU	1.5 days	12/20/05	12/21/05	[Gantt bar]																									
477	Install Final SIU	1.5 days	12/20/05	12/21/05	[Gantt bar]																									
478	Install Test Instrumentation	6 days	10/8/05	10/17/05	[Gantt bar]																									
479	Install and Test Accelerometers	3 days	10/8/05	10/12/05	[Gantt bar]																									
480	Install and Test TC's	3 days	10/12/05	10/17/05	[Gantt bar]																									
481	Integration Readiness Review (IRR)	0 days	10/25/05	10/25/05	[Gantt bar]																									
482	ACD Install and Test	7 days	10/31/05	11/9/05	[Gantt bar]																									
483	Install ACD	2 days	10/31/05	11/2/05	[Gantt bar]																									
484	Test ACD	5 days	11/2/05	11/9/05	[Gantt bar]																									
485	LATTE4 16 Tower Tests with ACD	10 days	11/9/05	11/25/05	[Gantt bar]																									
486	FSW/LICOS Installation	35 days	11/9/05	12/30/05	[Gantt bar]																									
487	FSW Delivery w / EM SIU	0 days	11/9/05	11/9/05	[Gantt bar]																									
488	FSW Install and Checkout	15 days	11/9/05	12/2/05	[Gantt bar]																									
489	LICOS Installation	5 days	12/2/05	12/9/05	[Gantt bar]																									
490	LICOS LAT CPT	15 days	12/9/05	12/30/05	[Gantt bar]																									

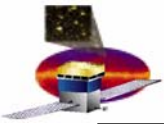




I&T Detail Schedule (2 of 2)

ID	Task Name	Duration	Start	Finish	Schedule																											
					August	September	October	November	December	January	February																					
					6	14	22	30	7	15	23	1	9	17	25	2	10	18	26	4	12	20	28	5	13	21	29					
490	Install LAT Hardware	21 days?	10/19/05	11/17/05																												
491	EMI Skirt Installation	1 day	10/19/05	10/20/05																												
492	Bulkhead Panel and Cable Installation	3 days	10/20/05	10/25/05																												
493	Heat Pipe Patch Panel Integration	3 days	10/20/05	10/25/05																												
494	Mount +Y and -Y Heat Pipe Patch Panels	0.5 days	10/20/05	10/21/05																												
495	Align and Install Downspout Heatpipe	1 day	10/21/05	10/22/05																												
496	Install Panels	0.5 days	10/22/05	10/24/05																												
497	Bond Thermistors to DSHP's	1 day	10/24/05	10/25/05																												
498	HIB Integration	2 days	10/25/05	10/27/05																												
499	ACD Bulkhead Panel Cable Installation	2 days	10/27/05	10/31/05																												
500	Grid Mechanical Part Integration	6 days?	11/9/05	11/17/05																												
501	Heater Control Box (HCB) Integrations	1 day?	11/9/05	11/10/05																												
502	Install Temp Sensor Brackets	0.5 days	11/10/05	11/11/05																												
503	Fit check Blanket Bars	0.5 days	11/11/05	11/11/05																												
504	Mount Blanket Bar Brackets	1 day	11/11/05	11/14/05																												
505	Grid Box Electrical Connection	3 days?	11/14/05	11/17/05																												
506	Install and route Heater Cables	1 day?	11/14/05	11/15/05																												
507	Check Grid heaters, thermal sensors	2 days	11/15/05	11/17/05																												
508	LAT Level System Test	15.63 days	12/30/05	1/23/06																												
509	X-LAT Plate installation	2 days	12/30/05	1/3/06																												
510	Light-tight Tests	2 days	1/3/06	1/5/06																												
511	Flight Radiator Fit check	1 day	1/5/06	1/6/06																												
512	Flight Software Validation w/ LAT	5 days	1/6/06	1/13/06																												
513	LICOS LAT CPT, SVAC, E2E	15 days	1/13/06	1/23/06																												
514	Pack & Ship to NRL	5 days	1/24/06	1/31/06																												



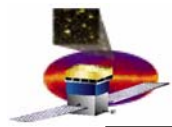


Issues & Concerns

ISSUES

- Availability of flight hardware.
 - SIU & EPU Deliveries
 - TKR Deliveries
- TKR A Replacement (see following charts)

CONCERNS



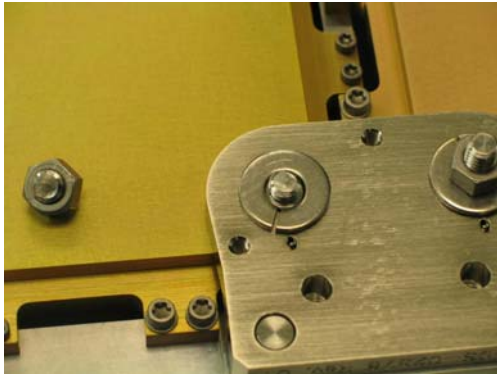
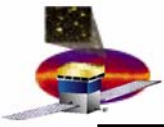
TKR A Replacement Risk Assessment

Operation	Risk	H, M, L	Mitigation
Remove cable trays and shear plates	Damage to shear plate stud while removing discrepant nuts; requires disassembly of Cal and/or replace with spare	H	Use the nut splitter to mechanically break the nuts.
	Debris from Adhesive Removal; leading to on-orbit shorts, optical surface degradation	M	Use hepa-Vac during removal to minimize dust and debris. Clean external surfaces
Demate Cables	Connector damage; loss of harness or component (13 mates)	M	Use proper demate technique and be very cautious
Remove CAL/TEM/TPS	Lift fixture/crane ops errors damage to adjacent components; resulting further LAT degradation	L	Established procedures, fixture maintenance/inspection
Debond TKR Flex cables	Damage to Flex cables while removing adhesive bond.	H	Use technique developed previously for flex cable removal.
Remove TKR	Lift fixture/crane ops errors damage to adjacent components; resulting further LAT degradation	L	Established procedures, fixture maintenance/inspection



TKR A Replacement Schedule Impact

Replacement TKR received:	TKR Removal and Replacement	Schedule Impact
10/13/2005	Completed during off shifts.	Minimal
10/20/2005	Completed after Tower 14 installation.	5 days
After 10/20/2005	Completed on arrival	Day for day plus 5 days (will delay testing with ACD)



Broken stud on Grid 2



Nut splitting demo



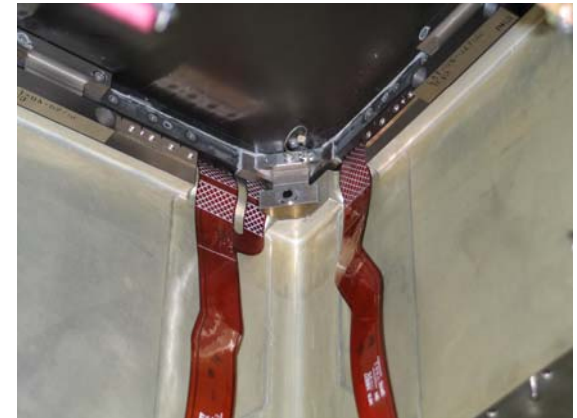
After splitter was removed



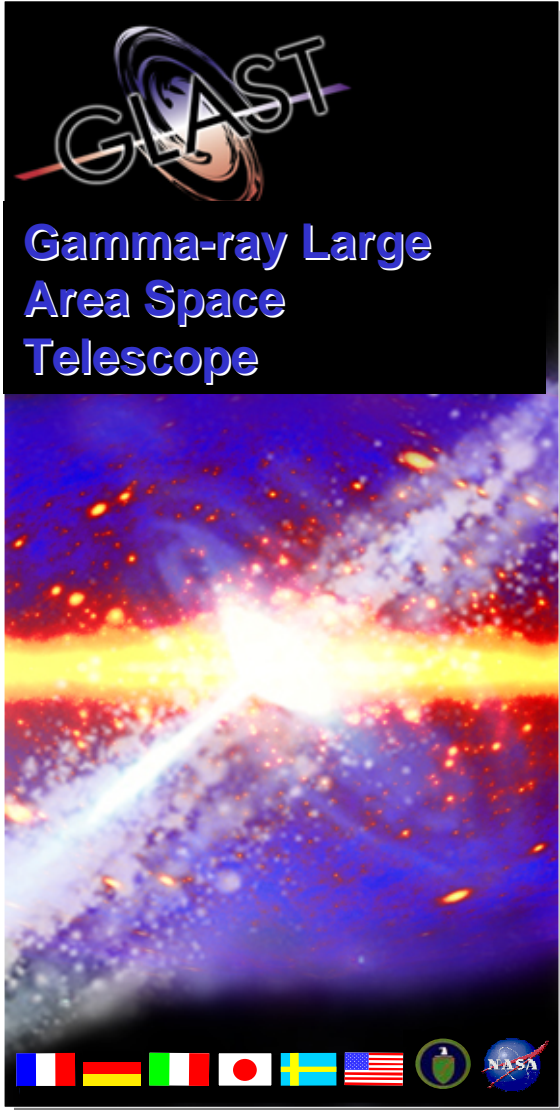
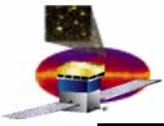
Debris removal



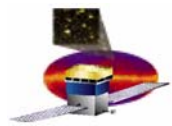
Limited access between DAQ Boxes



TKR cables after TEM CAL removal



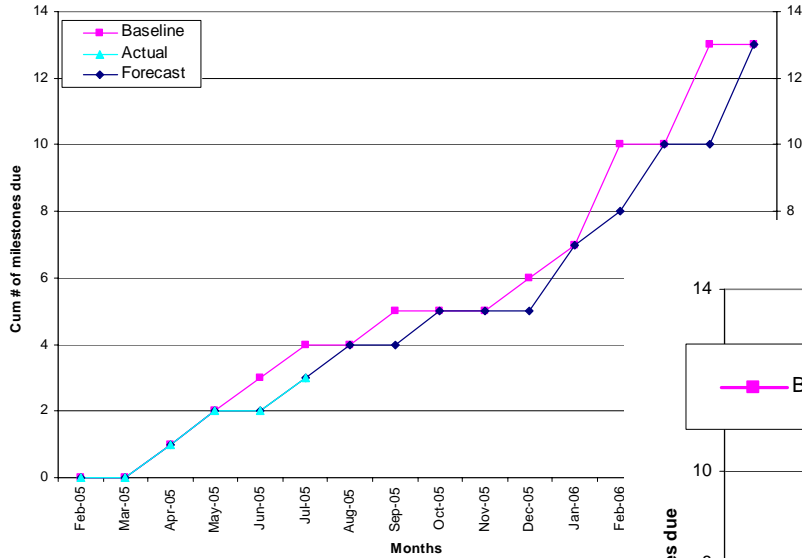
Cost/Schedule Reports for Presentation August 2005 Month End 4.1.9 Integration & Test



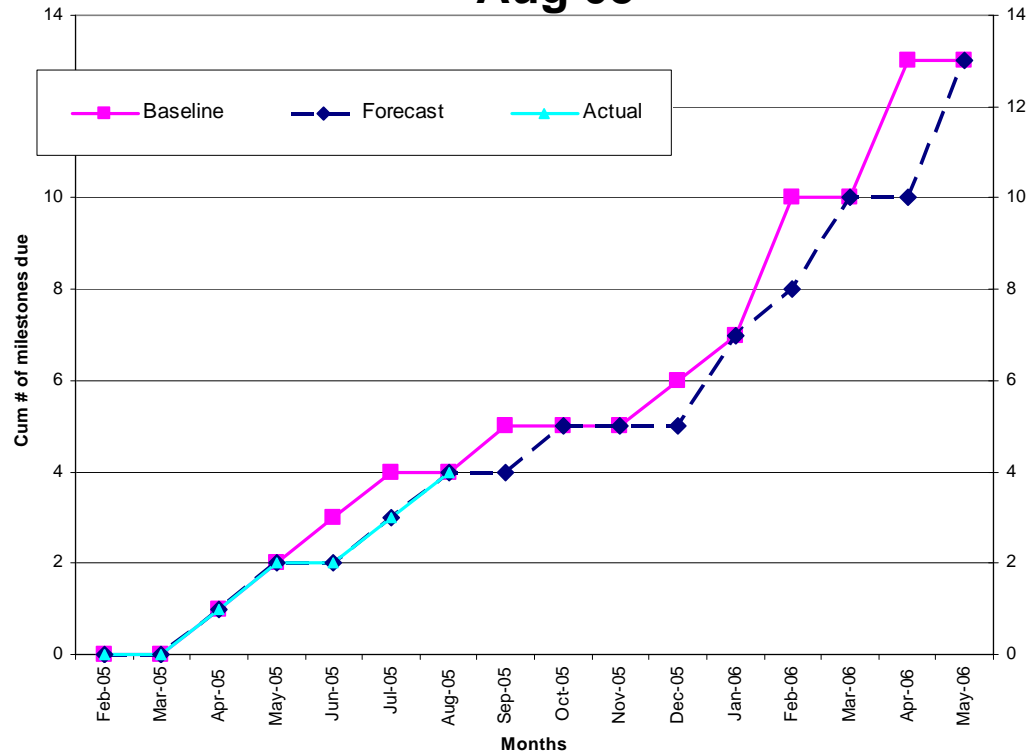
Level 3 Milestone Count

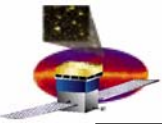
Jul 05

4.1.9 Level 3 Milestones



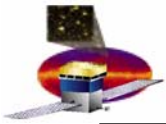
Aug 05





Level 3 Milestone List

Activity Description	Baseline Finish	-2m Var	-1m Var	Bsln Var	Early Finish	2005															
						2005						2006									
						F	M	A	M	J	J	J	J	A	S	O	N	D	J	F	M
4.1.9 I&T																					
Start 2 Tower Comprehensive	04/20/05	-3	-3	-3	04/25/05A				▼												
Start 4 Tower Comprehensive	05/12/05	-12	-12	-12	05/31/05A				▼												
Start 8 Tower Comprehensive	06/20/05	-33	-33	-33	08/05/05A				▼												
Online FU S/W Final Release-I&T to	07/14/05	0	0	0	07/14/05A				▼												
Start 16 Tower Comprehensive	09/07/05	-59	-23	-23	10/10/05						▼		▽								
LAT Ready to Ship to NRL for Env	12/20/05	-20	-17	-17	01/23/06												▼		▽		
Ship LAT to NRL for Env Test	12/26/05	-35	-30	-30	01/27/06												▼		▽		
LAT EMI/EMC Test	02/01/06	-44	-43	-43	03/16/06													▼		▽	
LAT Sine Vibe	02/14/06	-10	-9	-9	02/23/06													▼		▽	
LAT Acoustic Test	02/26/06	-30	-29	-29	03/27/06													▼		▽	
LAT TVAC	04/15/06	-32	-31	-31	05/16/06														▼		▽
LAT Weight & CG	04/17/06	-39	-38	-38	05/25/06														▼		▽
Ship LAT to Spectrum Astro	04/23/06	-35	-34	-34	05/27/06														▼		▽



Milestone Variance Explanation

- **Schedule Impact**
 - **None**
- **Cost Impact**
 - **Currently underrun**
- **Corrective Action**
 - **None required**

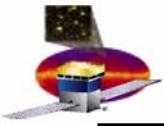
Cost Report

Monthly Contractor Financial Management Report 31-Aug-05							NASA form 533M Approved OMB # 2700-0		Report for Month Ending: 8/31/2005	
Reporting Category	Cost Incurred				Estimated Cost			Estimated Final Cost		Unfilled Orders Outstanding
	During Month		Cum. to Date		Detail		Balance of	Contractor	Contract	
	Actual	Planned	Actual	Planned	AT COMPL	0	Contract	Estimate	Value	
4.1.9 INTEGRATION & TEST										
4.1.9.1 I&T MANAGEMENT	23	51	1,228	1,307	46	0	79	1,354	1,354	0
4.1.9.3 INSTR OPS COORDINATOR	0	0	31	31	0	0	0	31	31	0
4.1.9.4 MECH GROUND SUPT EQUIP	24	12	2,098	1,943	155	0	-155	2,098	2,098	2
4.1.9.5 ONLINE SOFTWARE	0	0	654	654	0	0	0	654	654	0
4.1.9.6 INTEG, FACILITIES, CONFIG & TEST	190	147	3,377	3,732	488	0	355	4,219	4,219	7
4.1.9.7 PARTICLE TEST	0	0	44	48	0	0	4	48	48	4
4.1.9.8 ENVIRONMENTAL TEST	38	82	496	688	60	0	192	747	747	6
4.1.9.9 SCIENCE VERIFICATION, ANALYSIS & CALIBRATI	0	0	300	300	0	0	0	300	300	0
CAPW[3]Totals:	275	291	8,228	8,702	749	0	475	9,451	9,451	19



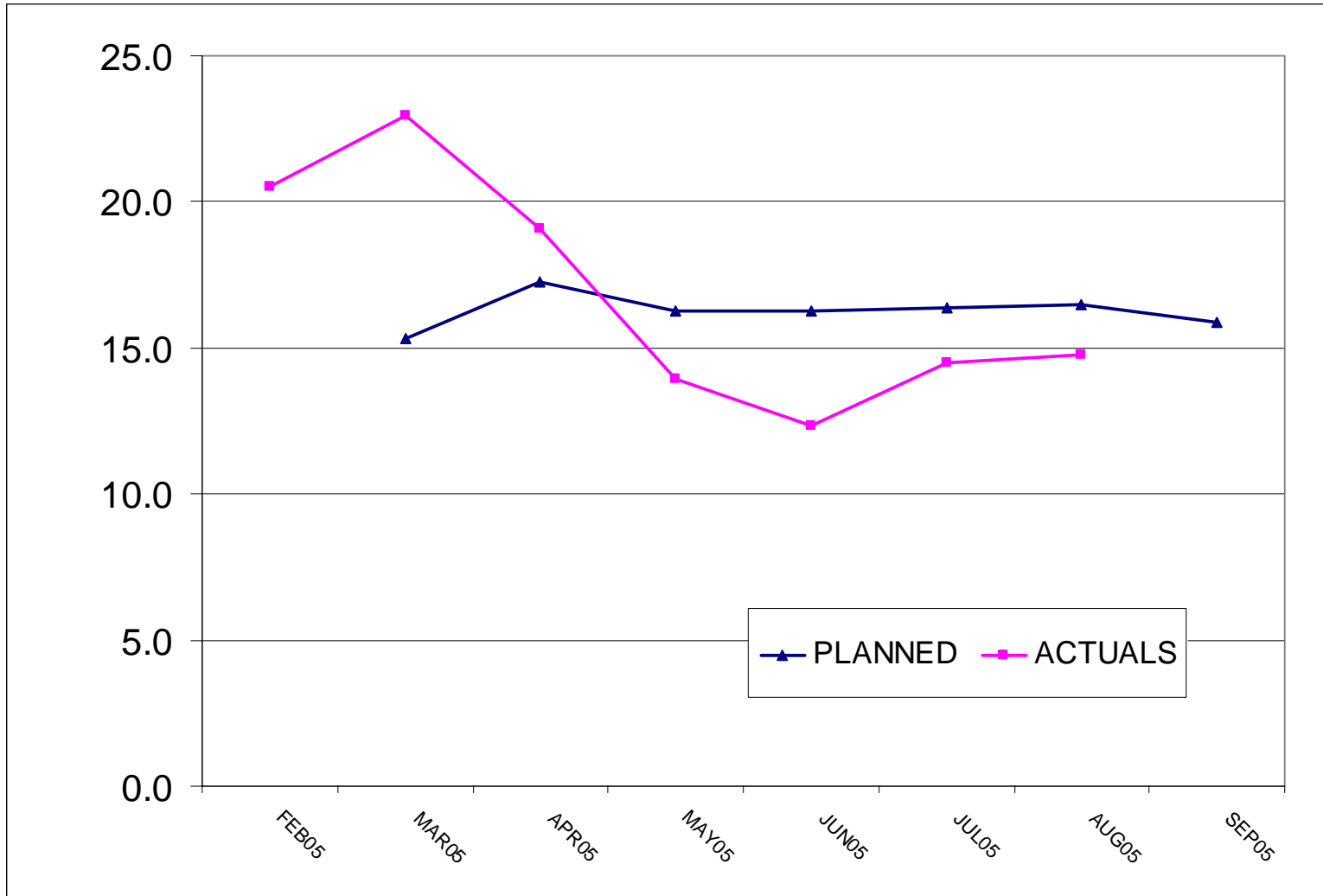
Cost Variance Explanation

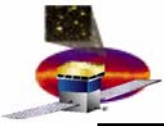
- **Why overrun/underrun?**
 - **Underrun due to operating under planned headcount**
- **What will be done to correct?**
 - **Plan to add staff as hardware is delivered**



FTE Report

(DOE/NASA-funded only)





FTE Variance Explanation

- **Why overrun/underrun?**
 - **Underrun due to voluntary terminations.**
- **What is the impact?**
 - **None**
- **What will be done to correct?**
 - **Plan to increase staffing for system test.**