

AntiCoincidence Detector

GLAST Large Area Telescope: Cost/Schedule Review

June 30, 2005

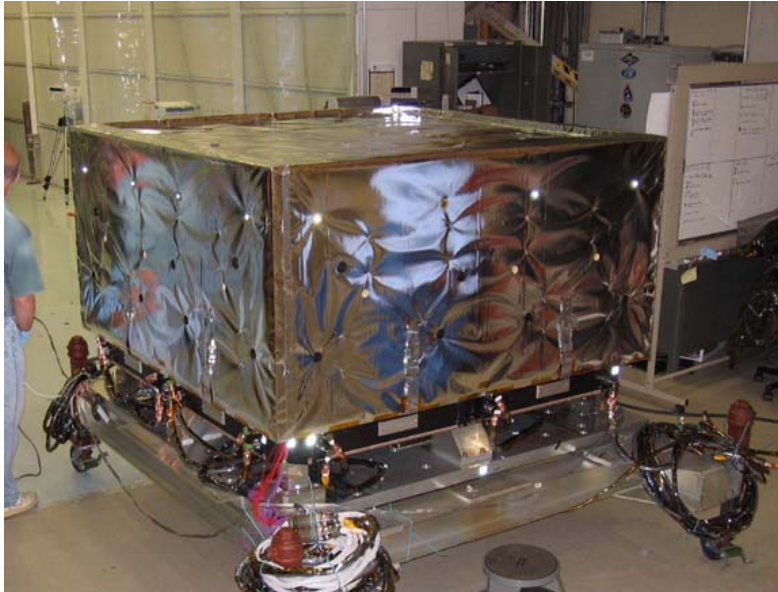
**AntiCoincidence Detector (ACD)
Subsystem
WBS: 4.1.6**

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SIGNIFICANT ACCOMPLISHMENTS

Integrated ACD with MMS



◆ *The ACD is integrated*

–All 194 detector channels have been connected to their associated electronics and verified to be functional and light tight.

–Functional testing has been completed.

–The MMS is installed

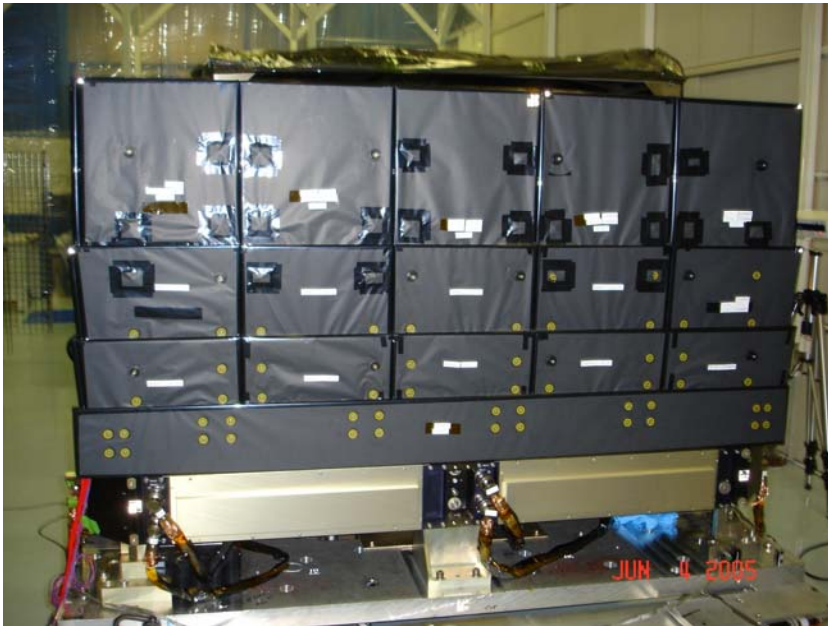
◆ **Completed the ACD Pre-Environmental Review on June 8. Received 3 RFA's and 4 recommendations. Responses have been prepared for all RFA's and recommendations. Only remaining liens are to finish performance testing and place the EGSE under configuration control.**

◆ **Sucessfully completed CSCM testing on an Electronics Chassis**

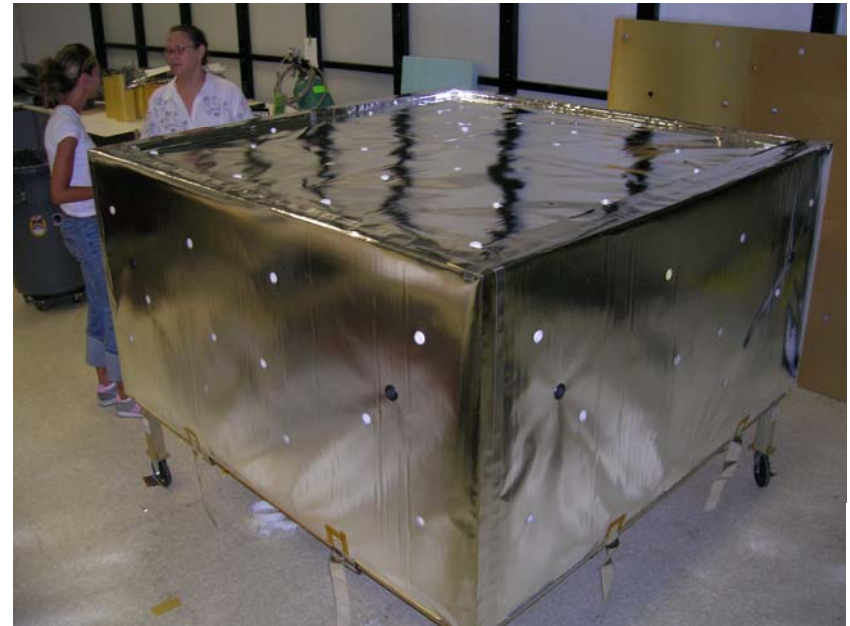
◆ **Closed out TBD PR's and TBD PFR's**

SIGNIFICANT ACCOMPLISHMENTS

Integrated ACD (prior to MMS installation)



Assembled Micrometeoroid Shield



◆ **Completed assembly of the Micrometeoroid Shield**

–Following assembly it was baked out and met the outgassing requirements in 5 days. This is an outstanding accomplishment considering the amount of fabric, foam, and adhesives used for the assembly of the MMS. The MMS assembly team as well as the ACD materials engineers did a great job on providing a “clean” MMS for the ACD.

SIGNIFICANT ACCOMPLISHMENTS

Lifting the MMS



Installing the MMS



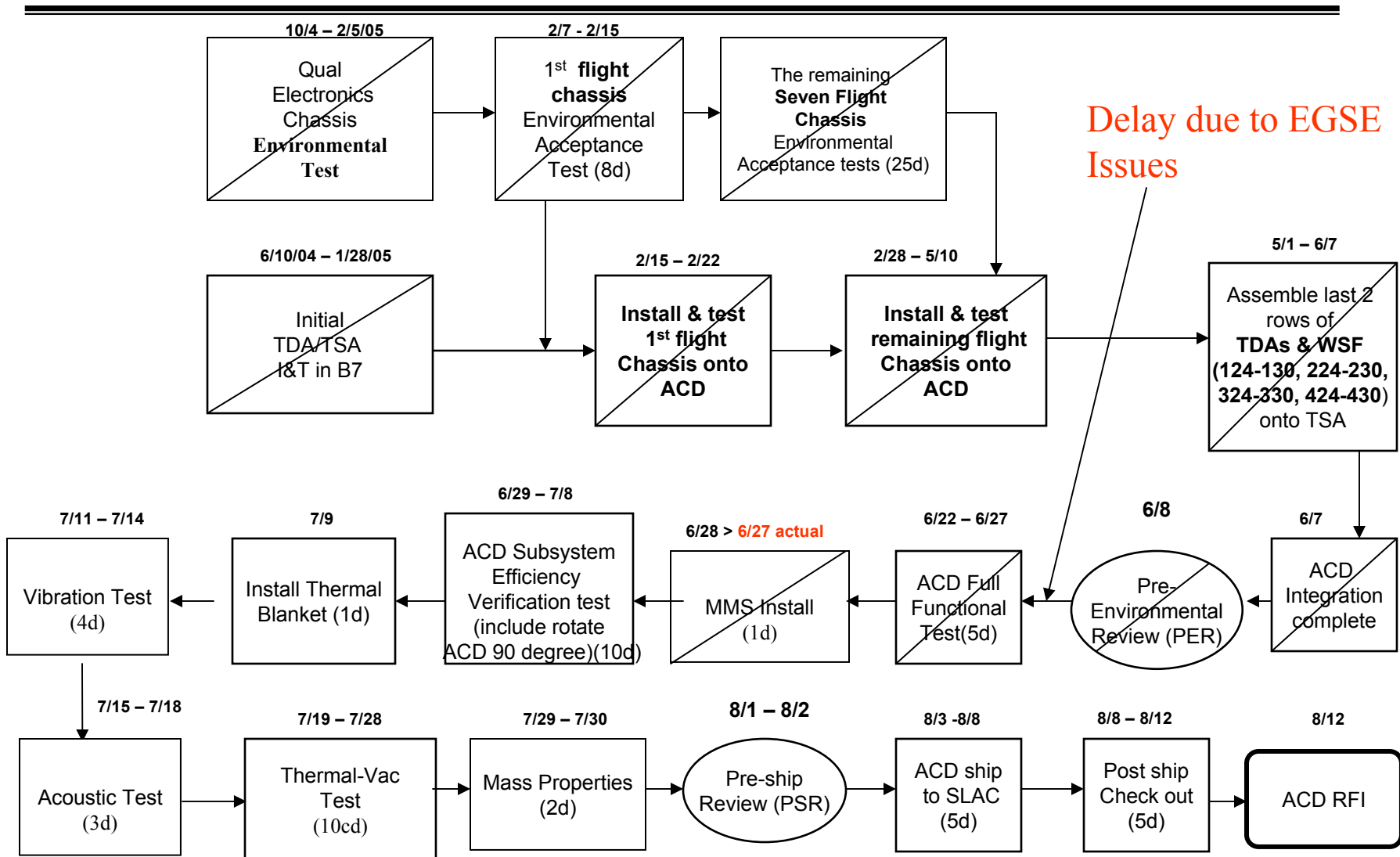
◆ *Integrated the MMS*

–Challenging job was performed flawlessly, one day before a temporary shutdown of critical lifts at Goddard.

Near Term Milestones

Milestone Description	Date	New Date	Status/Notes
(4) electronic chassis vib/ tvac tested and RFI	3/5/05	<u>4/26/05</u>	<u>COMPLETED</u>
(4) electronic chassis vib/ tvac tested and RFI	3/28/05	<u>5/13/05</u>	<u>COMPLETED</u>
ACD Integration Complete	4/6/05	<u>6/7/05 (Act)</u>	<u>COMPLETED</u>
ACD Functional Test	4/13/05	<u>6/6/05 (Act)</u>	<u>COMPLETED</u>
ACD PER	5/24/05	<u>6/8/05 (Act)</u>	<u>COMPLETED</u>
Efficiency Verification Test	6/3/05	6/16/05 <u>7/8/05</u>	<u>This milestone has been on a day for day slip due to EGSE issues. It has begun and is scheduled to be completed by 7/8. We are working to finish it early.</u>
Thermal Vacuum	6/15/05	6/27/05 <u>7/19-28/05</u>	<u>This test will now be performed following vib and acoustics.</u>
MMS/TB Installation	6/17/05	<u>6/29/05</u>	<u>MMS complete and installed. TB ready for installation on 7/11.</u>
Vibration	6/23/05	<u>7/11-14/05</u>	
Acoustics	7/15-18/05		

ACD - Schedule Flow (as of 6/22)



EGSE – Test Stands

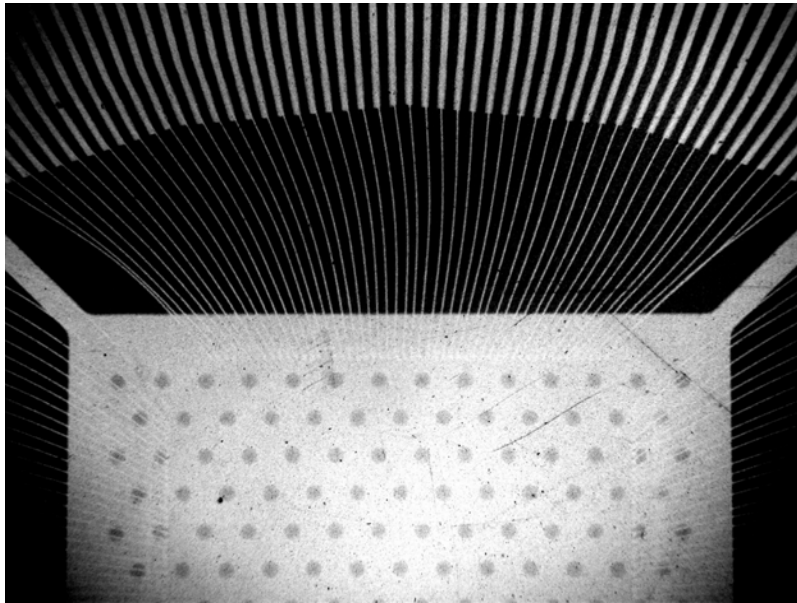
Recent Activities

- A status is sent out daily, so I will not repeat everything here.
- The functional test, including margin testing has been completed.
- Performance testing is underway. Planned completion date is 7/8, but trying to pull in to 7/3.
- Working to resolve some data anomalies.
- Resolving many of the test script errors and closing out PRs.

Other Issues – **UPDATES IN RED**

- **GASU Vacuum Testing**
 - **Issue: GASU#8 has never been tested in vacuum. Therefore there is a risk that an issue could arise during full up ACD thermal vacuum testing. We need a response to our request concerning this issue.**
 - **CLOSED. Report (ACD-RPT-000359) has been distributed and everyone (including GSFC Code 560) concurs that the risk of proceeding without vacuum testing the GASU is low.**
- **EMI Descope CR needs to be approved.**
 - **CLOSED – CSCM testing successfully completed and CR has been approved.**
- **Thermal Balance Descope CR needs to be approved.**
 - **CLOSED – CR has been approved.**

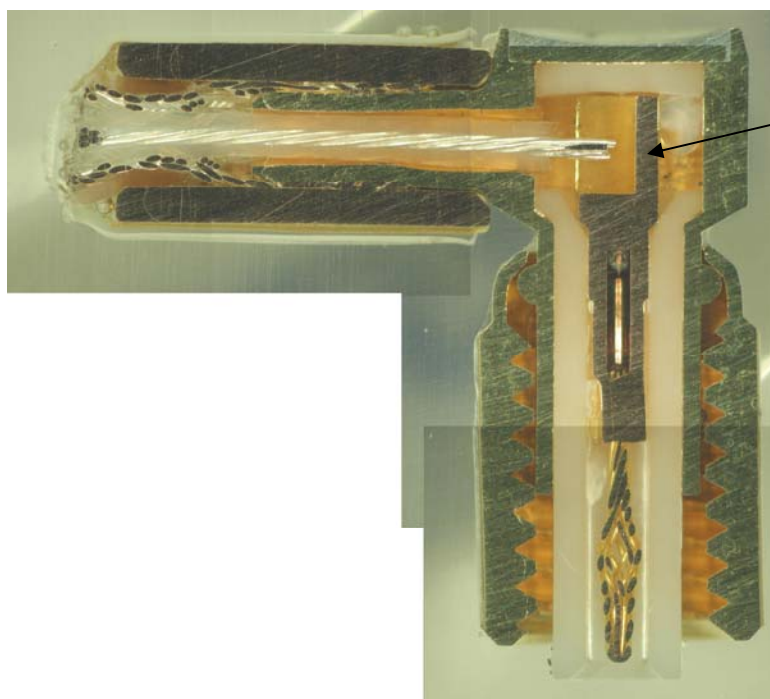
GARC Issue - NEW



Wire overlap

- **GARC wire bond overlap**
 - **Issue: Flight GARCs (digital ASIC) passed through the screening process with an abnormal x-ray. The cause of this issue is that the radiographic results were not reviewed. The 2D image clearly shows that two bond wires cross, however the vertical separation between the wires can not be seen. The good news is that the GARC has been tested without anomaly at the part, free board, and chassis level, however the radiographic results do raise concern. Preliminary feedback is that everything will be fine and corrective action will not be required. Working with Code 560 to resolve.**

Lepra/Con Issue - NEW



Empty solder cup

- **Lepra/Con Failure**
 - **Issue: One (of 194) flight PMT signal connector failed vibration testing.**
 - **Cause: Workmanship. No solder at connector junction.**
 - **Resolution: Repaired in place. FRB will be held to close out PFR.**

ACD Problem /Failure Report Status

As of June 7, 2005 a total of 312 Problem Reports (PR's) and 20 Problem Failure Reports (PFR's) have been opened

- ▶ 303 PR's have been closed (38 closed since last report)

- ▶ 9 PR's open
 - ▶ 8 for EGSE related problems

 - ▶ 1 for a broken fiber on Tile Detector Assembly 230

- ▶ 18 PFR's have been closed (5 closed since last report)

- ▶ 2 PFR's are open
 - ▶ PMT signal wire connector - Green

 - ▶ TDA gaps - Yellow

Lien List

LIEN #	Description	LAT Cost	Full Cost
2	MMS/TB Bakeout. Assumes 7 day B/O followed by chamber certification. Assumes no schedule impact. \$15.3K for facility (email from L. Tilwick on May 9) assuming facility cost sharing and \$4.5K for test set up / tear down.	35	35
3	TVAC in SES vs. Facility 225. One half of the cost difference provided (500 has already agreed to pick up 1/2 of the difference). Estimate provided by 549 was \$50-75K total.	0	0
4	31 day schedule delay due to documentation, integration issues, technical issues, EGSE software, etc. Per day cost. = \$6.3K (\$18K full cost)	195.3	558
5	GASU #8 Vacuum Test - GASU #8 has not seen vacuum testing and will be vacuum tested with flight hardware. Failure could damage ACD flight hardware. Performing this test has an estimated 5 day schedule impact and this impact is figured into the cost estimate.	0	0
6	Additional stress analysis on MMS/TB attachment points to incorporate thermal loads imparted by MMS/TB	8.5	18.5
7	Increase manpower support on MMS to pull in delivery date.	35	35
8	Additional S&MA support to prepare for PER, close out PRs, and monitor floor activities	15	15
9	Three additional vibration tests on Electronic Chassis and final resolution and closeout of vibration frequency shift.	29	29
10	Alignment hardware for the Optical fiber to PMT connection.	8	8
11	Unplanned code 600 lab tax. \$32K in FY06 and \$24K in FY07	56	56
12	Tracker simulator	6	6
13	Facility costs	30	30
	TOTAL	381.8	754.5

Change from last month: LAT Cost = -11.5K, Full Cost = +94K

Level 3 Milestone List

Activity Description	Baseline Finish	-2m Var	-1m Var	Bsln Var	Early Finish	2005												2006					
						F	M	A	M	J	J	A	S	O	N	D	D	E	J	A	F	M	A
4.1.6 ACD																							
ACD Test Scripts (from ACD to I&T)	03/15/05*	-54	-54	-76	06/30/05	▼																	
ACD Flight Unit at SLAC,	07/15/05	-21	0	-10	07/29/05																		

Run Date 06/23/05 16:47
 Data Date 06/01/05
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GLAST LAT PROJECT
Level 3 Milestones
Baseline Variance (Organized by Subsystem)

LT-DZ: Baseline Variance
 FL-D4: AV: Level 3 Milestones
 Report #10
 Sheet 5

Milestone Variance Explanation

- **Explanation - Our RFI date has slipped due to incomplete EGSE software. Without a fully functional EGSE system to test the ACD, the ACD can not begin environmental testing. Since the remaining work on the ACD is performed serially, we are experiencing a day for day delay until the EGSE system is fully operational. Full functional testing on the ACD has been successfully completed and performance testing is currently underway. Issues with the test scripts and test data have been encountered during performance testing and they are being resolved by the ACD team with the assistance of the LAT on-line team. The ACD science team is evaluating the performance test data and they are working on reducing the planned ten day duration of the ACD performance test. Following the completion of the performance test, the ACD will begin environmental testing, starting with vibration.**
- **Schedule Impact - ~1 month, July 15 to August 12**
- **Cost Impact – Detailed in lien list**
- **Corrective Action – Potential to descope some performance testing**

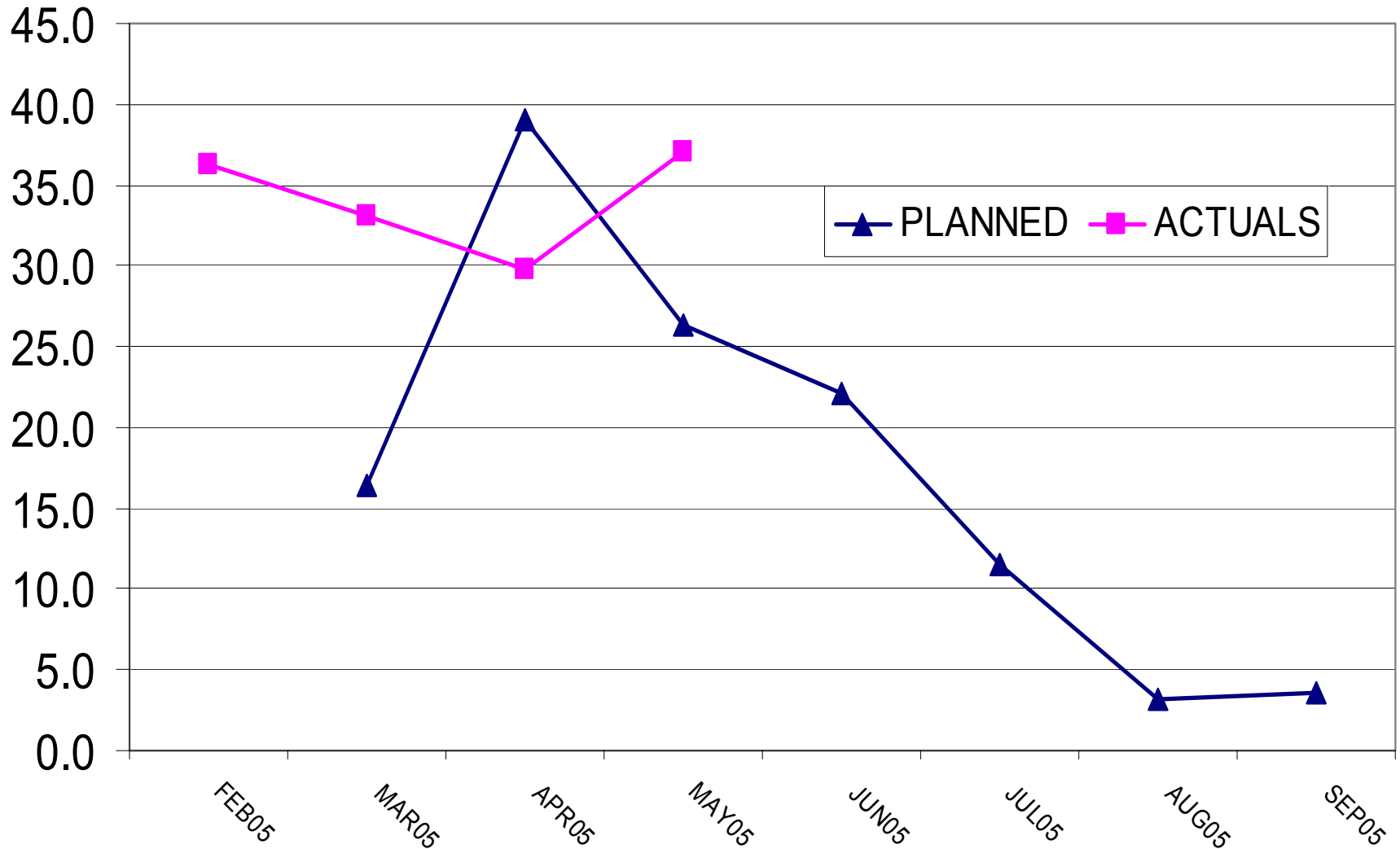
Cost Report

Reporting Category	Cost Incurred				Estimated Cost			Estimated Final Cost		Unfilled Orders Outstanding
	During Month		Cum. to Date		Detail		Balance of Contract	Contractor Estimate	Contract Value	
	Actual	Planned	Actual	Planned	JUN05	JUL05				
4.1.6 ANTICOINCIDENCE DETECTOR										
4.1.6.1 ACD PROJECT MANAGEMENT/SYS ENGRG /SCI SUPP	8	41	3,841	3,895	43	38	190	4,113	4,113	15
4.1.6.2 SAFETY & MISSION ASSURANCE	22	43	828	843	26	0	14	869	869	0
4.1.6.3 TILE SHELL ASSEMBLY (TSA)	-2	20	3,770	3,792	0	0	22	3,792	3,792	17
4.1.6.4 BASE ELECTRONICS ASSEMBLY (BEA)	8	50	6,544	6,639	0	0	95	6,639	6,639	57
4.1.6.5 MICROMETEOROID SHIELD/THERMAL BLANKET ASSY	25	38	535	656	38	0	121	694	694	0
4.1.6.6 ACD MECHANICAL QUALIFICATION & CALIBRATION UN	0	0	177	177	0	0	0	177	177	0
4.1.6.7 ACD INTEGRATION & TEST	110	171	585	594	108	16	9	718	718	0
4.1.6.8 LAT INTEGRATION & TEST SUPPORT	0	0	0	0	0	3	14	17	17	
4.1.6.B GROUND SUPPORT EQUIPMENT (GSE) & FACILITIES	46	0	856	951	0	0	95	951	951	21
CAPW[3]Totals:	217	363	17,135	17,546	216	56	561	17,968	17,968	110

Cost Variance Explanation

- **Why overrun/underrun? Lag in invoicing on several mechanical support tasks and the MMS/TB task. Additional cost underrun due to schedule variance.**
- **What will be done to correct? Complete performance testing and move onto environmental testing. Submitting a CR to cover costs identified in the ACD lien list.**

FTE Report (DOE/NASA-funded only)



FTE Variance Explanation

- **Why overrun/underrun? Additional EMI testing, resolve technical issues required to complete ACD integration, and prepare for PER.**
- **What is the impact? Cost.**
- **What will be done to correct? Moving people off of project.**