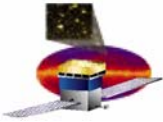




GLAST Large Area Telescope: Performance & Safety Assurance

Joseph Cullinan
SLAC
Performance & Safety Assurance Manager

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4.1.A P&SA – Status September 2005

- DAQ/Electronics

TEM/TPS:

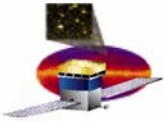
- Have now completed handoff of 19 TEM/TPS assemblies to I&T
 - Reviewing acceptance data packages for completeness
- Replacement of TPS units currently installed in Bays 0 and 4 completed per NCR #562
 - MRB concurred to remove TPS units only from Bays 0 and 4. Existing TEMs, CALs and TKR Towers remained in Bays 0 and 4.
 - Replacement TPS units with HV calibration constants similar to those of the TPS units to be removed were selected from fully tested TEM/TPS assemblies
 - TPS units removed from bays 0 and 4 currently being reworked to print
 - Testing and calibration following replacement has been completed

PDU:

- 1st PDU completed environmental testing; resolving final NCRs and documentation in preparation for hand-off to I&T
- 2nd PDU CCAs completed pre-conformal coat testing; returned to Aeroflex for final assembly

GASU:

- 1st GASU scheduled to complete final assembly at Aeroflex this week and ship to SLAC
- Updated GASU drawings and BOM to reflect changes following initial GASU board level testing
- Boards and CCAs for 2nd GASU still in assembly at Aeroflex



4.1.A P&SA – Status September 2005

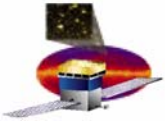
- DAQ/Electronics

QA issues with hardware built at Aeroflex:

- 4 connectors damaged on GASU board; found at final inspection at Aeroflex
 - Connectors had to be removed and replaced; rework caused lifted trace that required repair with jumper wire
- Excessive air bubbles and some bare spots in conformal coating observed on some boards at SLAC
- Misalignment of connectors observed on some boards
 - one on LCB requires replacement due to fit problems discovered at SLAC
- Bent leads observed on LCB ACTEL
- Some soldering issues observed (cold solder joints, solder balls, solder peaks at pads)

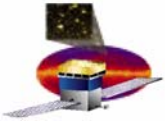
Most workmanship issues have been reworked at SLAC, but it is time consuming.

- SLAC QE on-site this week at Aeroflex to review assembly process, hardware handling practices and acceptable workmanship requirements with Aeroflex personnel and SLAC QE
- Workmanship standard being followed (IPC J-STD-001) sometimes unclear on rejectable conditions, resulting in disagreement between Aeroflex and SLAC source QA on accept/reject criteria for board assembly



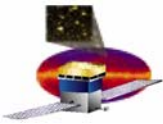
4.1.A P&SA – Status September 2005

- Integration and Test
 - Supported completion of 8 Tower testing
 - Supported integration of two additional towers into Grid
 - Coordinating MRBs to work through NCRs for closure



4.1.A P&SA – Status September 2005

- Tracker
 - Supported successful pre-ship review of Towers 7, 9 and 10
 - Currently reviewing on-line Tower acceptance data packages for completeness and accuracy
 - Supporting current MRB review of bottom tray electrical failure of Tower 14 observed during T/V testing
 - Replacement bottom tray is available and will complete thermal cycle testing and vacuum testing prior to installation into Tower 14
 - Plan is to perform at least one-axis vibration test of Tower 4 after new bottom tray is installed. No plan to repeat T/V test on reworked Tower 14
 - MRB agreed to replace bottom tray of Tower 14 as proposed by INFN and consider Tower 16 acceptable for flight



4.1.A P&SA – Status September 2005

- Tracker

Pioneer Flex Cables:

- Continued support of in-process and final source inspection of cable assemblies at Pioneer
- Final flight cables (one C2 and one C5) are scheduled for completion 9/30/05
 - Will support receiving and final test for hand carry to INFN 10/1/05
- Minor workmanship issues observed during source inspections were quickly addressed and have not become problematic
- GSFC has not rejected any Pioneer test coupons to date

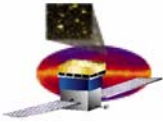
Flex Cables Qualification Test Plan

Parlex:

- Qualification test plan is documented
- Total of 10 flight and non-flight cables will be used to complete qual testing
- Non-flight cables will be hand selected to ensure qual testing will not be impacted by nonconforming condition of cable. Non-flight cables with slight annular ring failures would be best candidates.

Pioneer:

- Qualification plan needs to be documented and submitted to SLAC/GSFC for approval
- Testing will be the same as that performed by Parlex
- Number of cables used as qualification samples TBD; proposing to GSFC to use fewer samples than Parlex because of design similarity



4.1.A P&SA – Status September 2005

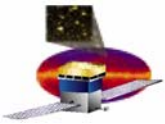
- Mechanical Systems

- X-LAT Plate

- Delivered to SLAC in July; reviewed acceptance data package from Lockheed Martin. Minor changes required to complete

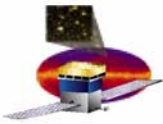
- Radiators

- Environmental testing complete (no sine vibration performed per SLAC/LM agreement)
 - Pre-ship review held; plan to ship by 9/30/05
 - Plan to complete acceptance data package review this week
 - LM still completing documentation



4.1.A P&SA – Status September 2005

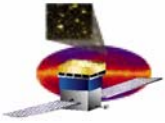
- FSW QA
 - Supported review of FSW Test Procedures (EVTFIL, FECALB, DCMODE, WBTLMV, FILMGT, THRMCS, OPMODE suites).
 - Supported the I&T release of LATTE R4.10.0 with V&V and document review for LAT Docs; supported V&V of Elogbook 3.6.0.
 - Supported B0-5-0 build planning and participated in test team's first dry runs of several test procedures;
 - Continued support of FSW Test Script development and LICOS development
 - Participated in Peer Review Process Assessment with GSFC SW QE (R. Worden).
 - No findings were noted by GSFC during the assessment; some reports of Peer Reviews were not available on the web and will be provided



LAT NCR Metrics 9/26/05

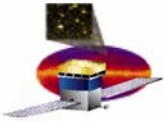
Subsystem	Open NCRs	Closed NCRs last 30 days	Open NCRs 30 days	Open NCRs 90 days	NCRs ready to close (need final QA review to close)
DAQ	59	29	28	11	5
Tracker	56	6	48	35	34
Mechanical	3	2	1	1	1
CAL	0	0	0	0	0
ACD*	10*	0	5*	0	0
I&T	28	3	25	12	2

* includes 4 open ACD PRs and PFRs from GSFC



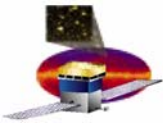
Issues and Concerns

- Flex Cable Qual Testing
 - Need to complete successful qual testing of Parlex cables as production ends
 - Need to finalize qual plan from Pioneer with SLAC and GSFC approval and initiate testing
- Workmanship issues at Aeroflex
 - Continued problems could impact schedule and result in scrapping of hardware late in production cycle
 - Workmanship issues have been documented/photographed, and are communicated to Aeroflex as they are observed.
 - Plan to have LAT QA and source inspector follow assembly and in-process/final inspections closely. On-site efforts and involvement by SLAC QE will continue to monitor and improve workmanship consistency.



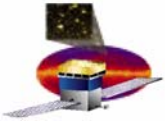
4.1.A P&SA – Planned Accomplishments October 2005

- Support 1st GASU environmental testing
- Oversee electronics assembly at Aeroflex to reduce workmanship issues
- Support flex cable qual testing at Parlex and Pioneer
- Support Grid static load testing
- Finalize receiving of Lockheed Martin hardware



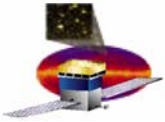
Cost Report

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 Contract	Contractor Estimate	Contract Value		
	Actual	Planned	Actual	Planned	AT COMPL					
4.1.A PERFORMANCE AND SAFETY ASSURANCE										
4.1.A.1 PERFORMANCE ASSURANCE MANAGEMENT	1	21	785	866	19	0	81	885	885	0
4.1.A.2 QUALITY ASSURANCE	72	72	2,825	2,630	66	0	-195	2,696	2,696	0
4.1.A.3 TRAINING	0	0	14	14	0	0	0	14	14	0
4.1.A.4 RECORDS MANAGEMENT	0	0	42	42	0	0	0	42	42	0
4.1.A.5 SYSTEMS SAFETY	0	0	0	0	0	0	0	0	0	0
4.1.A.6 EEE PARTS CONTROL PROGRAM	4	0	214	210	0	0	-4	210	210	0
CAPW[3]Totals:	78	93	3,880	3,761	85	0	-119	3,846	3,846	0

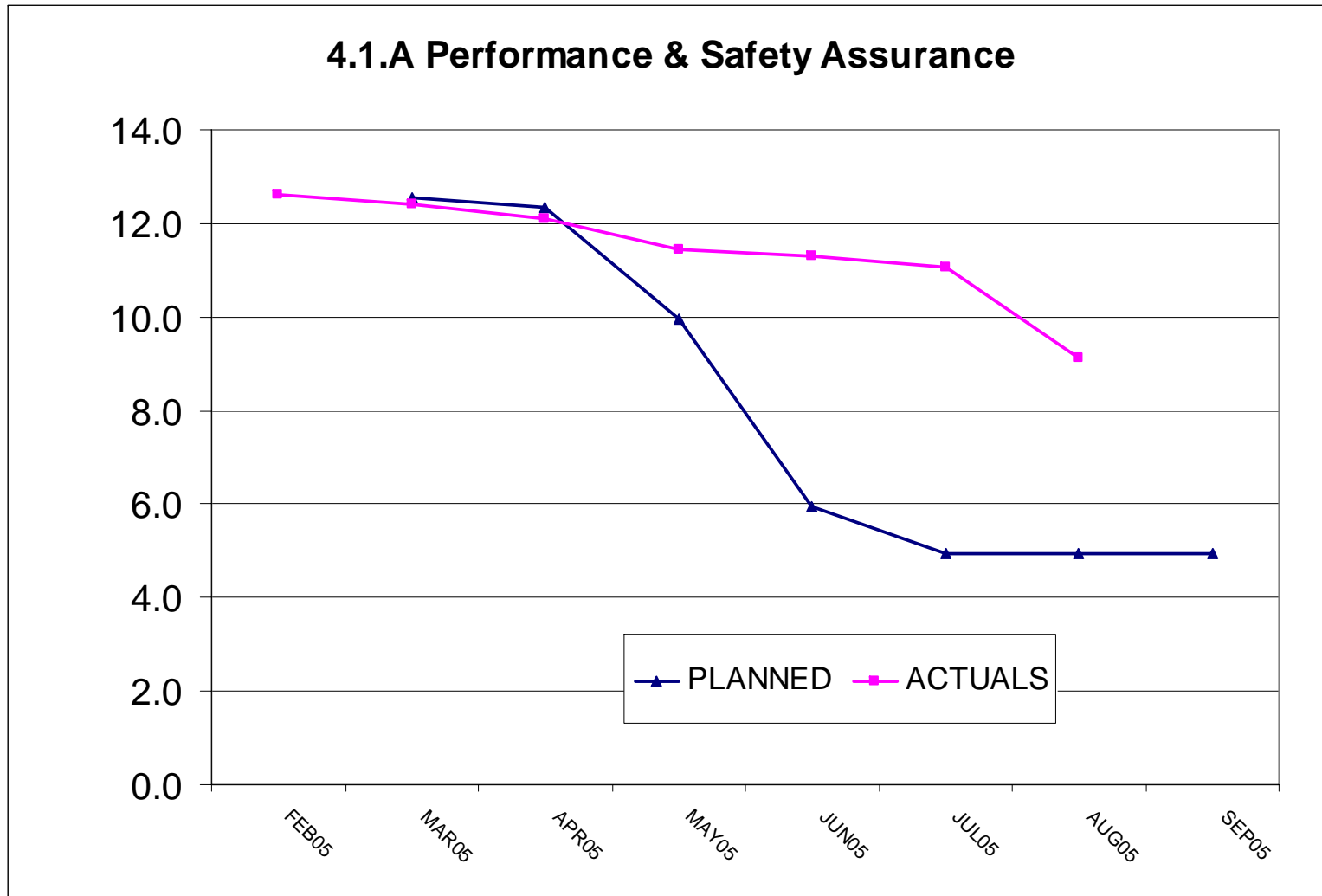


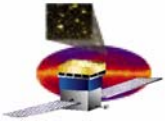
Cost Variance Explanation

- **Why overrun/underrun?**
 - **Underrun due to reduction in personnel (2 FTE at GTC and Teledyne rolled off at end of July). Also vacation time taken in August lowered overall actuals.**
- **What will be done to correct?**
 - **No corrective action required. Will look to consolidate headcount as subsystem level production nears completion**



FTE Report (DOE/NASA-funded only)





FTE Variance Explanation

- **Why overrun/underrun?**
 - **Needed to continue current level of QE support at SLAC. 2FTE (source inspectors) reduction due to end of production at GTC and Teledyne**
- **What is the impact?**
 - **FTE did not reduce in September due to QA need at SLAC**
- **What will be done to correct?**
 - **Look to consolidate FTE at SLAC in October-November**