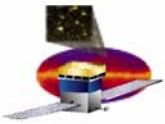


# GLAST Large Area Telescope: Performance & Safety Assurance

Joseph Cullinan  
SLAC  
Performance & Safety Assurance Manager

cullinan@slac.stanford.edu  
(650) 926-5034



## 4.1.A P&SA – Status July 2005

---

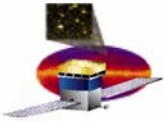
- DAQ/Electronics

TEM/TPS:

- Completed documentation review and handoff of three TEM/TPS units to I&T
- In process of completing acceptance data packages for five additional TEM/TPS units that have completed environmental testing

PDU/GASU:

- Supporting initial testing of PDU assembly, will support vibration test scheduled this week
- Supporting GASU board level testing
  - NCR #586 written against GLTC write/read anomaly
  - MRB planned to discuss removal and replacement of 2 GLTCs (first evaluated on EGSE board)



## 4.1.A P&SA – Status July 2005

---

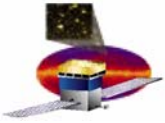
- DAQ/Electronics

LCB/SIB/CPS boards:

- Documented workmanship issues with first SIB, LCB and CPS boards delivered and reviewed these issues with Aeroflex and SLAC source inspector
- Bent leads, missing component, missing thermal compound, insufficient solder fillets were observed at SLAC incoming inspection
- Aeroflex and source inspector now submitting in-process inspection reports for board assembly to document observed workmanship issues
  - Aeroflex assembly plan is to capture all in-process assembly issues and perform one final rework after assembly is complete.

Cables:

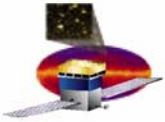
- Performing final inspection of 64 cables on site at vendor this week
- Approximately 40 spare cables will be completed by vendor in mid August to complete cable production.



## 4.1.A P&SA – Status July 2005

---

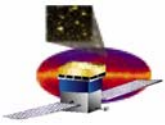
- Integration and Test
  - Continued support of 6-tower testing
    - Working to resolve and close NCRs related to testing



## 4.1.A P&SA – Status July 2005

---

- . TKR
  - Held two MRBs with GSFC and INFN to disposition flex cables to support Towers 8/9 and Towers 10/11 environmental testing.
    - Lack of availability of flight cables required non-flight test cables to be installed on towers (removed and replaced with flight cables after environmental testing). Some towers were tested without a full compliment of eight flex cables installed.
    - MRB also accepted as flight cables with known microcracks in connectors, based on test history and favorable results from on-going evaluation of cracked connectors at GSFC
    - MRB also accepted as flight some cables with annular ring test coupon failures based on x-ray analysis of actual cables. X-rays showed discernable annular rings existed at extreme ends of these cables.
    - Plan is to test towers with at least one flight approved cable per side. Every effort will be made to test towers with all eight cables installed.
    - Plan at INFN is to create an NCR to document location of non-flight cables installed in each tower; NCR will remain open until non-flight cables are replaced with flight cables.
    - LAT QA working closely with TKR group to clearly document cable status and history for MRB review/ acceptance of flex cables for each tower environmental test.



## 4.1.A P&SA – Status July 2005

---

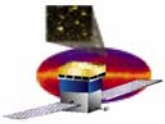
- TKR

Pioneer Flex Cables:

- Approved Omnetics connector bonding process
  - Shear strength of bonded connector samples was greater than shear strength measured on Parlex coupons

TMCM :

- Supported final TMCM production, inspection/shipment of parts to Teledyne and finished TMCMs to INFN
- LAT QA completed final review to ensure acceptance data packages for production run is complete and all Teledyne NCRs are closed
  - Working to close out final SLAC NCRs on TMCMs



## 4.1.A P&SA – Status July 2005

---

- Mechanical Systems

### X-LAT Plate

- Delivered to SLAC last week; still awaiting acceptance data package from Lockheed Martin.
- Need to return lifting sling to LM for scheduled rework.

### Radiators

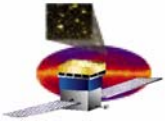
- Setup for acoustic testing proceeding
  - Thermostats bonded on –Y radiator heat pipe reservoirs debonded prior to test; LM evaluation underway
- Vibration testing (sine vibrate deleted by agreement) and T/V testing to follow



## LAT NCR Metrics 7/26/05

<b>Subsystem</b>	<b>Open NCR's</b>	<b>Closed NCR Last 20 days</b>	<b># Over 30 Days Open</b>
<b>DAQ</b>	<b>50</b>	<b>41</b>	<b>35</b>
<b>Tracker (SLAC)</b>	<b>53</b>	<b>9</b>	<b>40</b>
<b>Mechanical</b>	<b>2</b>	<b>0</b>	<b>2</b>
<b>Calorimeter (SLAC)</b>	<b>0</b>	<b>1</b>	<b>0</b>
<b>ACD (GSFC PRs and PFRs)</b>	<b>18</b>	<b>*</b>	<b>*</b>
<b>I&amp;T</b>	<b>31</b>	<b>3</b>	<b>22</b>
<b>* No metrics provided</b>			

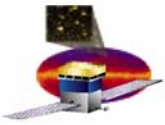




## 4.1.A P&SA – Status July 2005

---

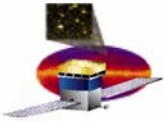
- Software QA
  - Completed review FSW Candidate Releases B0-3-0 and B0-4-0
  - Peer review process for FSW test procedures in progress.
    - First test procedures are in sign-off for LAT Docs release
  - Supported recent I&T releases for LATTE 4.9.1 and ELogbook 3.5.0, including V&V, documentation, witness/sign-off on test procedures
  - Currently tracking Test scrip V&V (pre-FQT), build process dry runs, test procedure development status
  - LAT QA maintains active role in FSW CCB



# Issues and Concerns

---

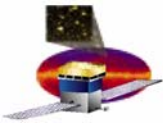
- Pioneer Flex Cables
  - Pioneer reported problems in meeting the 0.002” minimum annular ring requirement for first panels built
    - This has caused a delay in delivery of cables
    - LAT QA, GSFC, TKR have scheduled a visit to Pioneer tomorrow (7/27) to review production schedule and technical issues delaying cable delivery
- Tower testing
  - Critical need to closely follow non-flight cables used to support tower environmental testing to ensure they are removed and replaced with flight cables at INFN
  - Maintain MRB format to review cables with liens for acceptance as flight cables
- Aeroflex board assembly workmanship
  - Expect to see improvement now; Aeroflex is aware of issues with first board deliveries to avoid repeating problems
    - Will continue incoming inspection of all boards at SLAC and can support on-site final inspection of boards at Aeroflex



## 4.1.A P&SA – Planned Accomplishments August 2005

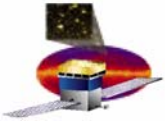
---

- Support PDU, GASU testing
- Support continuing effort to develop acceptable soldering process for cPCI connectors
- Support completion of cable production run at Cicon
- Maintain oversight of flex cable selection to support tower environmental testing
- Work to close NCRs



# Cost Report

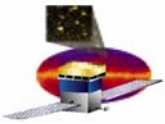
Reporting Category	Cost Incurred/Hours Worked				Estimated Cost/Hours to Complete			Estimated Final Cost/Hours		Unfilled Orders
	During Month		Cum. to Date		Detail		Balance of Contract	Contractor Estimate	Contract Value	Outstanding
	Actual	Planned	Actual	Planned	JUL05	AUG05				
4.1.A PERFORMANCE AND SAFETY ASSURANCE										
4.1.A.1 PERFORMANCE ASSURANCE MANAGEMENT	10	20	782	827	18	21	64	885	885	0
4.1.A.2 QUALITY ASSURANCE	132	91	2,596	2,495	63	72	-35	2,696	2,696	5
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	0	0	210	210	0	0	0	210	210	0
CAPW[3]Totals:	142	111	3,644	3,587	81	93	28	3,846	3,846	5



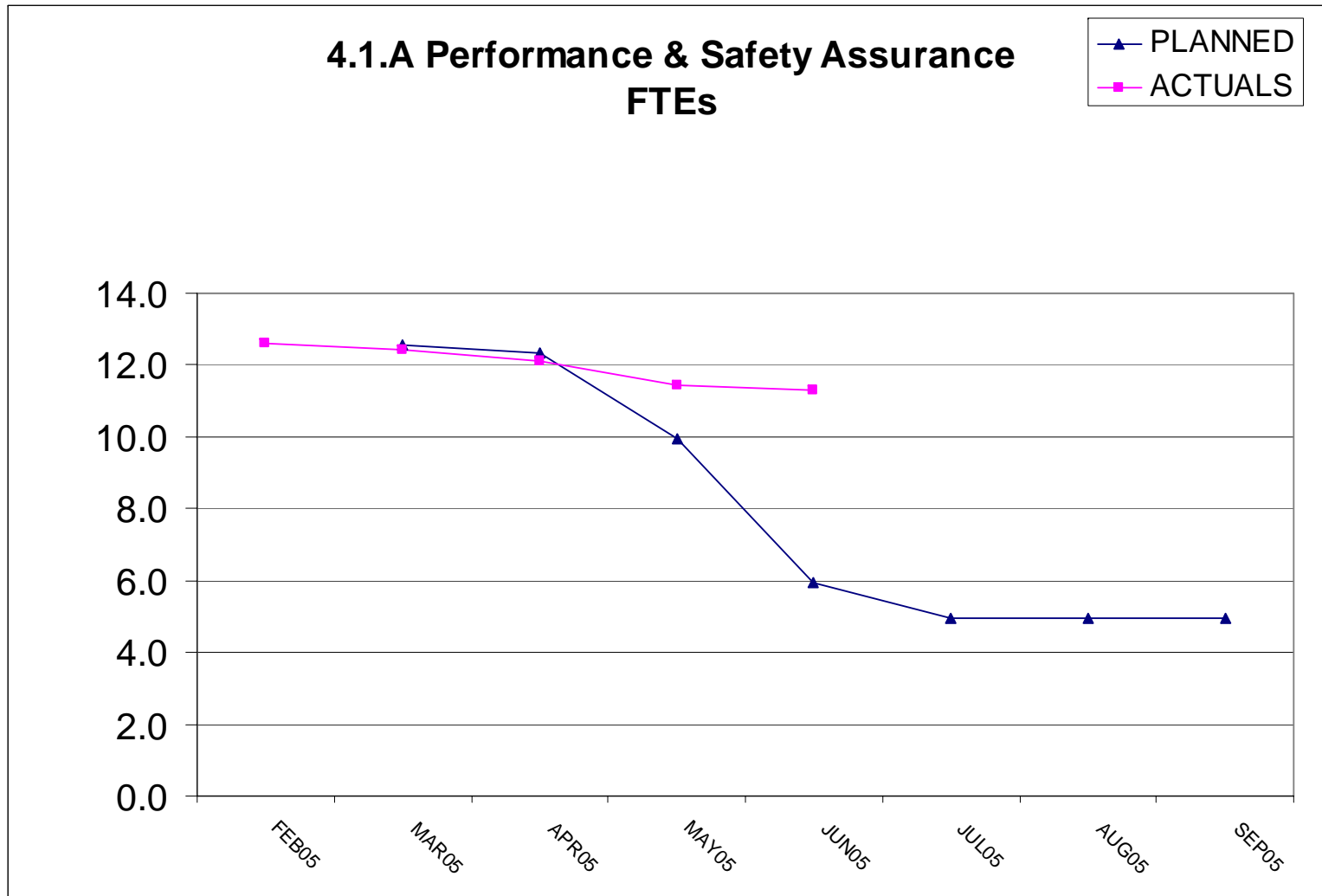
# Cost Variance Explanation

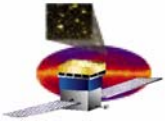
---

- **Why overrun/underrun?**
  - **Did not reduce headcount to follow planned FTE dropoff due to extended production runs at vendors with full time source quality engineers. Also required same headcount as last month to support subsystem production and testing.**
- **What will be done to correct?**
  - **Source quality engineers at Teledyne and General Technology will roll off once production ends (2 FTE)**
  - **Look to consolidate QA headcount at SLAC in August as subsystem production (cables, TEM/TPS, incoming inspection) ramps down**



# FTE Report (DOE/NASA-funded only)





# FTE Variance Explanation

---

- **Why overrun/underrun?**
  - **Source QA support was needed longer than expected at Teledyne and General Technology to support production. Also needed to continue current level of QE support at SLAC**
- **What is the impact?**
  - **2 FTE required to support extended production cycles at these two vendors**
- **What will be done to correct?**
  - **Need for source QA support at Teledyne ended 7/22; support at General Technologies scheduled to end 7/29. This will reduce August FTE by 2. Also look to consolidate FTE at SLAC in August**