GLAST Large Area Telescope:
Performance & Safety Assurance

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4.1.A P&SA – Status
October 2005

• DAQ/Electronics

PDU:
- Completed handoff of 1st PDU (GLAT1898) to I&T
- 2nd PDU scheduled for delivery from Aeroflex in December

GASU:
- 1st GASU completed vibration testing
- CCAs for 2nd GASU still in assembly at Aeroflex

SIU:
- Completed environmental testing on proto-flight and first two flight boxes

New vibration testing facility used for GASU and 2 SIUs
- Primary vendor (Wyle Labs) had equipment problems
- Quanta Labs (Santa Clara) was used to maintain test schedule
- QA survey was conducted prior to hardware testing; no QA issues
- Quanta Labs engineering support and test equipment capabilities is superior to that of Wyle
4.1.A P&SA – Status
October 2005

- DAQ/Electronics

QA issues with hardware built at Aeroflex:

- Returned backplane (GLAT 2418) after observing flux residue on cPCI connector pins and discoloration/contamination in areas of conformal coat
  - Aeroflex received board yesterday and will evaluate for cleaning/rework
  - Expect rework to complete by next week

- cPCI X-ray evaluation
  - NCRs have been generated when solder touch up is required
  - GSFC also reviewing X-rays of soldered connectors for solder void/fill evaluation
  - Will schedule MRB to discuss any differences between GSFC and SLAC evaluations

- Continue to receive timely in-process and pre-ship inspection reports for each board from SLAC source QA at Aeroflex, so workmanship issues and rework are clearly tracked
  - LAT QA also supporting twice weekly status telecons with Aeroflex
  - Workmanship issues with Aeroflex boards have not been completely eliminated, but have been greatly reduced and have not resulted in scrapping of CCAs
4.1.A P&SA – Status
October 2005

- DAQ/Electronics

RAD750 boards
- Spectrum/Astro reported particulate contamination (electrically conductive epoxy) on their two RAD750 boards (S/N 16 and 24) following rework at BAE
- SLAC RAD750 boards were also reworked; five flight boards (S/N 12, 14, 15, 17, 18) in-house at SLAC were inspected and did not show contamination levels observed on S/A boards; no additional cleaning was required
- SLAC received sixth flight board (S/N 13) yesterday; will inspect for contamination
- S/A to investigate cause of contamination on their boards and possibilities for cleaning
RAD750 board contamination
SLAC and Spectrum Astro observations

**S/N 018 (SLAC Board)**
Fine particulates observed lightly dispersed in localized regions (magnification 20X)

**S/N 024 (S/A Board)**
High density of particulate contamination. (magnification 30-40X)
RAD750 board contamination
SLAC and Spectrum Astro observations

S/N 018 (SLAC Board)
Area around processor leads is visibly clean. Typical of majority of S/N 018 surface (magnification 25-30X)

S/N 024 (S/A Board)
Area around processor shows heavy particulate contamination (magnification 30-40x)
4.1.A P&SA – Status
October 2005

- Integration and Test
  - Supported completion of 16 Tower integration and 16 Tower testing
  - Supporting inspection of parts and hardware still being received
  - Continue to lead weekly MRBs to work through I&T NCRs for closure
4.1.A P&SA – Status
October 2005

Tracker

- Supported successful preship review of final Towers delivered
- Supported Tracker team in addressing some specific INFN NCRs as requested by GSFC Product Assurance:
  - Identify Tower locations of TMCMs that incorporated silicone masking tape during assembly
  - Identify Tower locations of trays that incorporated epoxy encapsulant on MCM to SSD wire bonds
  - Cause of observed wire bond breakage on Tower A heavy trays
  - Cause of noisy channels observed in some trays
  - Cause of wire bonds shorting to SSDs in Tower 1 trays
- Response to these questions has been completed by Tracker team; plan on reviewing these issues with GSFC this week or next

- Finalized qualification test plan for Parlex and Pioneer flex cables
  - Plan has been approved by SLAC, GSFC and cable vendors
  - Will use qty = 10 bare flex cables from each vendor for qualification
  - Trace Labs (Hunt Valley, MD) will conduct the same qualification testing on Parlex and Pioneer cables
  - Goal is to successfully complete qualification testing before LAT ships to NRL
4.1.A P&SA – Status
October 2005

• Mechanical Systems
  X-LAT Plate
  - Delivered to SLAC in July; reviewed acceptance data package from Lockheed Martin. Still have not received final data package
  - Need to repeat proof load test on lift fixture
    - Cracked welds observed after first proof load test
    - Fixture was reworked; needs to be retested/inspected

Radiators
- Received 9/30/05
- Identified open items in acceptance data package
  - LM has not yet completed data package

Static Load test (Grid #2)
- Supported Test readiness review with vendor (NTS)
- Delta TRR scheduled for tomorrow to close remaining issues
- LAT QA plans to witness and support static load test
4.1.A P&SA – Status
October 2005

- FSW QA
  - Completed first successful formal dry run of test script and procedure
  - Completed audit of Build B0-5-1 (one finding, two observations)
  - Supported V&V of LATTE Release R4.10.2
  - Continued support of FSW Test Script development, dry runs and LICOS development
  - Participated in Quality Requirements Management Process assessment with GSFC SW QE (R. Worden).
    - No findings were noted by GSFC during the assessment
### LAT NCR Metrics 11/3/05

<table>
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<tr>
<th>Subsystem</th>
<th>Open NCRs</th>
<th>Closed NCRs last 30 days</th>
<th>NCRs Open 30 days or more</th>
<th>NCRs Open 90 days or more</th>
<th>NCRs ready to close (disposition complete; need final QA review to close)</th>
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* includes 5 open ACD PRs and PFRs from GSFC
Issues and Concerns

• Flex Cable Qual Testing
  - Need to complete qual testing of Parlex and Pioneer flex cables. Goal is to complete before LAT ships to NRL

• Final data packages and lift fixture from Lockheed Martin
  - Open items in data package are identified; need LM support to close
  - X-LAT Lift fixture needs to successfully pass second proof load test and inspection

• Continued focus on addressing and closing NCRs
Support testing of electronics CCAs and boxes
Support formal dry runs of FSW test scripts/procedures
Continue to work closely with Aeroflex to minimize workmanship issues
Support and monitor results of flex cable qual testing
Support Grid static load testing
Work with Lockheed Martin to complete documentation packages and have remaining hardware delivered
## GLAST LAT Project

### Monthly Status Review – Nov. 3, 2005

## Cost Report

### 4.1.A PERFORMANCE AND SAFETY ASSURANCE

<table>
<thead>
<tr>
<th></th>
<th>During Month</th>
<th>Cum. to Date</th>
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### 4.1.B LAT INSTRUMENT SCIENCE OPERATIONS CENTER

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Cost Variance Explanation

- Why overrun/underrun?
  - Overrun due to higher FTE required for support than budgeted. Continue to show lower overall FTE.

- What will be done to correct?
  - FTE will continue to decrease. One SLAC QE (Richard Gobin) left program in October. Can reduce FTE as final subsystem hardware production is completed.
FTE Report
(DOE/NASA-funded only)
FTE Variance Explanation

- Why overrun/underrun?
  - Needed to continue higher than budgeted level of QE support at SLAC.

- What is the impact?
  - FTE continues to decrease. Will see decrease of approx 1 FTE in October (SLAC QE left project)

- What will be done to correct?
  - Further reduction of FTE at SLAC expected in December as hardware production ends