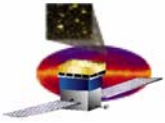


GLAST Large Area Telescope: Performance & Safety Assurance

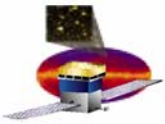
**Darren Marsh
SLAC
Performance & Safety Assurance Manager**

**Marsh@SLAC.Stanford.Edu
650-926-4577**



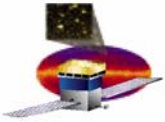
Outline

- ☐ **Manpower Update**
- ☐ **Significant Accomplishments**
- ☐ **Nonconformance Report Summary**
- ☐ **Issues and Concerns**
- ☐ **Three Month Milestones**
- ☐ **Cost Variance Analysis**



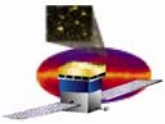
Manpower Update

- **Quality Engineering**
 - **Three senior level Quality Engineers on board**
- **Source Inspection Support**
 - **Contract in place for source inspection support for Tracker MCM production activities at Teledyne Electronic Technologies in Los Angeles**
 - **Planned start date of 1/26/04 slipped to 2/4/04**
 - **Pre-production contract needs to be modified to account for on-site QA oversight at Teledyne**
 - **Flight MCM SOW covers requirement for full-time QA oversight at Teledyne**
- **EEE Parts Assurance Support at SLAC**
 - **Individual secured for two months beginning 2/4/04**
- **Quality Inspection Support**
 - **Purchase requisition submitted for acquisition of two quality inspectors**
 - **Start date anticipated to be last week of February**



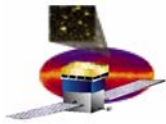
Significant Accomplishments

- **Grid manufacturing support**
 - **Supported Grid Manufacturing Readiness Review (MRR) 12/18/03**
 - **Presented QA efforts to date and defined quality plan for final grid manufacturing**
 - **Addressed plan for quality surveys and process approval of plating vendors, witnessing/documenting special processes, etc.**
- **Created first draft of LAT MRB Procedure**
 - **Establishes procedures, organization and responsibilities of the LAT MRB**
- **Supported GSFC Quality Audit performed at SLAC Jan. 19-23**
 - **No findings were identified**
 - **Significant progress in QA System development noted in close-out meeting**
 - **26 recommendations provided in draft report**
 - **6 recommendations immediately implemented**



Significant Accomplishments (Con't.)

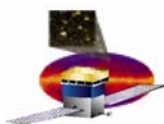
- **Quality System Development**
 - LAT QA defining and assigning Supplier Quality Assurance Requirements (SQAR) to purchase orders, as flow down QA requirements for LAT flight hardware suppliers
 - Flight hardware procurement process now ensures all flight hardware is delivered to Building 33 (LAT Receiving) for proper control and incoming inspection
 - Established Bonded Stores processes for receipt, storage and inventory control of flight hardware
 - Established QA inspection stations in cleanroom and bonded stores in Building 33
 - Provided critical QA requirements to INFN at Pisa workshop (Jan. 13-14) for documentation/configuration control, materials/parts traceability, nonconformance reporting/MRB, EIDP, supplier control, inspections and readiness reviews



Closed Nonconformance Reports

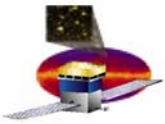
(Since last Monthly Status Meeting)

	NCR No.	Open Date	Description of Non-Conformance	Summary of Disposition	Close Date
1.	32	10/23/03	Tracker Honeycomb material has various visual imperfections	Affected material was scrapped and new material ordered. Source inspection being performed prior to next shipment	1/3/04
2.	38	11/26/03	dc/dc regulators were inadvertently opened without using ESD precautions and in an uncontrolled environment	Parts evaluated by LAT Parts Control Board. Non-effected parts accepted for "use-as-is".	1/2/04
3.	48	1/13/04	PWB coupon failed annular ring requirement	Affected PWB's scrapped	1/23/04



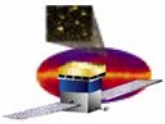
Open Nonconformance Reports

	NCR No.	Open Date	Description of Non-Conformance	Comments	Close Date
1.	29	10/2/03	Tracker MCMs using nano-connectors with qualification testing not complete	Parts have passed visual. Contact resistance, thermal cycling. Shock/vibration testing starting 12/12.	
2.	39	12/1/03	DAQ PDU PMOS FET – SEM Inspection of wafer lot revealed worst case metallization of oxide step not meeting requirement	Waiver request submitted to LAT PCB for review.	
3.	41	12/9/03	PWB width and Step down dimensional discrepancies	Parts were manufactured to correct requirements. Drawing utilized for manufacturing not formally released. QA requires acceptable corrective action of configuration management issue.	
4.	42	12/10/03	1 PWB has exposed copper; 1 PWB is stain/foreign material; 5 PWBs with illegible serial number	5 PWBs with illegible serial number will be remarked, others are scrapped.	
5.	43	12/12/03	Omnetic connector issues. Jack screws too long and bond line between metal shell and connector body had inadequate peel strength	Tiger Team formed to resolve issues with supplier. Initial process changes appear acceptable.	
6.	44	12/15/03	Failed dielectric thickness from coupon testing	Parts are acceptable per previous design reviews. Drawing issue. LAT QA requires acceptable corrective action of configuration management problem.	
7.	45	12/19/03	Drawing utilized for manufacturing and inspection of bias circuits not formally released.	Formally released drawing required. LAT QA requires acceptable corrective action of configuration management issue.	
8.	47	1/5/04	Bias circuits not serialized per drawing.	Bias circuits require serial number. Supplier was contact and issue resolved.	



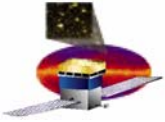
Issues/Concerns

- **Open RFA on inertia welding process for heat pipes at Lockheed Martin**
 - Submitted details of weld process qualification testing and in-process acceptance testing on all flight welds to GSFC to address this RFA
- **QA requirements flowed down at Pisa workshop need to be implemented at INFN and INFN suppliers**
- **Backlog of flight EEE parts that require incoming inspection**
 - Some components utilized for MCM fabrication were dropped shipped to Teledyne
 - Need to ensure incoming inspection of parts will be performed prior to start of flight production
 - Parts requiring DPA have been identified and samples will be pulled and sent to GSFC for DPA
 - Several shipments of EEE flight parts received in Building 33 have yet to be accepted by LAT QA



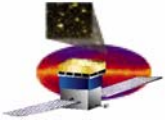
Three-Month Milestones

- **Complete in-process and final inspection of Lockheed Martin heat pipe – April 2004**
- **Formalize MRB procedure – January 2004**
- **Release Work Order requirements document and brief affected LAT personnel – February 2004**
- **Initiate Change Request for additional Quality Assurance Manpower – Completed**
- **Source inspector on board at Teledyne – February 4, 2004**
- **Close out GSFC RFA on LM inertial weld process control issue – January 2004**
- **Provide QA support for final grid machining and plating – Through April 2004**
- **Review quality system and production activities and perform source inspections related to the fabrication of Tracker bottom tray close-outs at Composites Optics – Through February 2004**



Three Month Milestones (Con't)

- **Develop records retention and traceability process for supplier quality documentation – February 2004**
- **Perform vendor surveys of Electronic Subsystem assembly houses – March 2004**



Cost Variance Analysis

- **Cumulative CV = \$93K**
 - **Management (CV = \$42K) Labor & travel costs lower than plan**
 - **Quality Assurance (CV = \$52K)**
 - **\$35K of variance due to delayed Stanford processing of subcontractor invoices. Actual expenditures in line with planning**
 - **Training (CV = \$2K)**
 - **Systems Safety (CV = \$0K)**
 - **EEE Parts Control Program (CV = \$0K)**