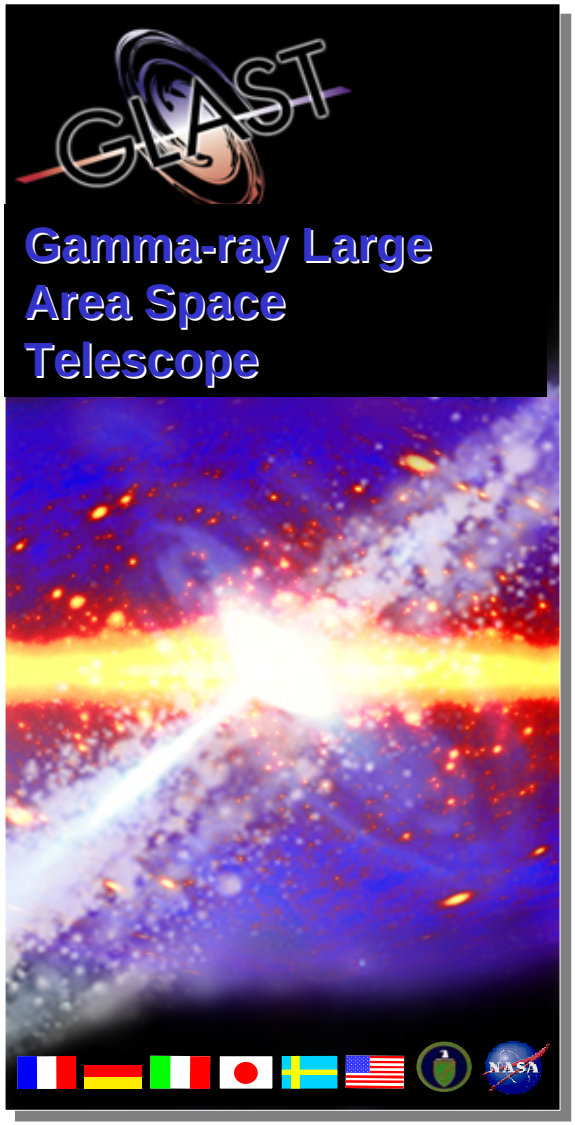

GLAST Large Area Telescope:

Integration and Test Two Tower Integration Readiness Review

I&T Quality Assurance

Doug Bartholomew
LAT Quality Engineering

Role of QA in I&T

- Complete incoming receiving inspections per LAT- TD-02797
  - Receipt of flight, MGSE, and EGSE hardware will include the following checks;
    - ID&D (identification and damage), visual inspection, cleanliness, documentation, and acceptance tests.
- Review I&T MGSE and EGSE
  - Ensure MGSE equipment has appropriate identification. (LAT-MD-01462)
  - Audit EGSE racks for validation and verification. (LAT-MD-01533)
- Witness all lifting and hoisting operations. (ES&H Bulletin 71)
- Witness all hardware torque operations per hardware installation procedure and drawing.
- Monitor effective contamination controls are in place (LAT-MD-00404)
- Monitor compliant ESD controls. (NASA-STD-8739.7)
- Witness connector mate/demate. Inspect pre and post mate/demate
- Develop and approve I&T procedures, work orders (AIDS), and process improvements
- Monitor current certification of all personnel working on the LAT

Roles and Responsibilities

- Quality Assurance Engineer (QE)
  - The QE is required to attend the Test Readiness Review (TRR), Daily Test Coordination meetings and the Post Test Review (PTR).
  - The QE has signature authority on the procedures and work order (AIDS) authorizations.
  - The QE signature is required on any black or red lines made to the procedure. (LAT-MD-03474)
  - The QE is an active participant in the test operations but only in an oversight role. The QE is responsible for the oversight of the following;
    - Ensure that all hardware and test logs are maintained.
    - Ensure that all requirements are accurately met
    - Ensure that any deviations are approved and documented prior to performance

Facility Audits and Surveillance

- Facility Readiness Review (SLAC I&T Facility – Building 33) was performed to evaluate readiness of the facility to receive, store, assemble and test flight hardware.
  - 4 findings and 22 observations were identified and documented. All findings and observations were closed
- Weekly surveillance of I&T Facility operations are performed by LAT QA and I&T personnel to verify compliance to requirements and procedures
  - 4 observations currently open

NCR Process

- All nonconformances will be documented in the SLAC GLAST LAT Nonconformance Reporting System
  - Nonconformance are to be documented immediately
  - SLAC QA will segregate or identify nonconforming material or hardware until nonconformance is dispositioned
  - All nonconformance reports shall have complete, concise problem identification, cause and corrective action
  - Open NCRs will be reported daily to I&T and reported weekly to the effected LAT management.

Nonconformance Reporting process

- The assigned LAT Quality Engineer will coordinate appropriate MRB activities based on Subsystem and classification of nonconformance.
  - Anti-Coincidence Detector (ACD), Calorimeter (CAL), Electronics (ELEC), Integration & Test (I&T), Instrument Ops Ctr (IOC), Mechanical Systems (MECH), Management (MNG), Performance & Safety Assurance (PSA), Science Software Sys Eng (SE).
- Emphasis will be placed on working with applicable I&T Subsystem Engineers throughout disposition effort.
- All rework or retest will be completed on the appropriate I&T documentation.
- Dispositions explain what actions will be taken or what information will be researched to resolve a nonconformance.
- The disposition also serves as a means to record information discovered as a result or inspections or troubleshooting actions.
- QA will assure that appropriate actions are taken to correct the discrepancy and return the product to an acceptable state prior to closing the NC.

Open Liens to flight hardware

- Subsystem liens will be documented on an NC as part of the receiving inspection process.
  - NCRs will be reviewed daily with I&T and reported weekly to the effected LAT management.
  - Open Grid liens (11/16/04):
    - 1. NCR #147:
      - Need to perform final measurement of Tracker bushing locations during alignment ops
      - Need to verify Spacecraft attach holes true positions on +X/-X sides are acceptable
    - 2. Complete end item data package from Tapemation expected 11/18/04