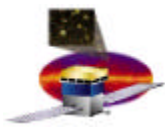


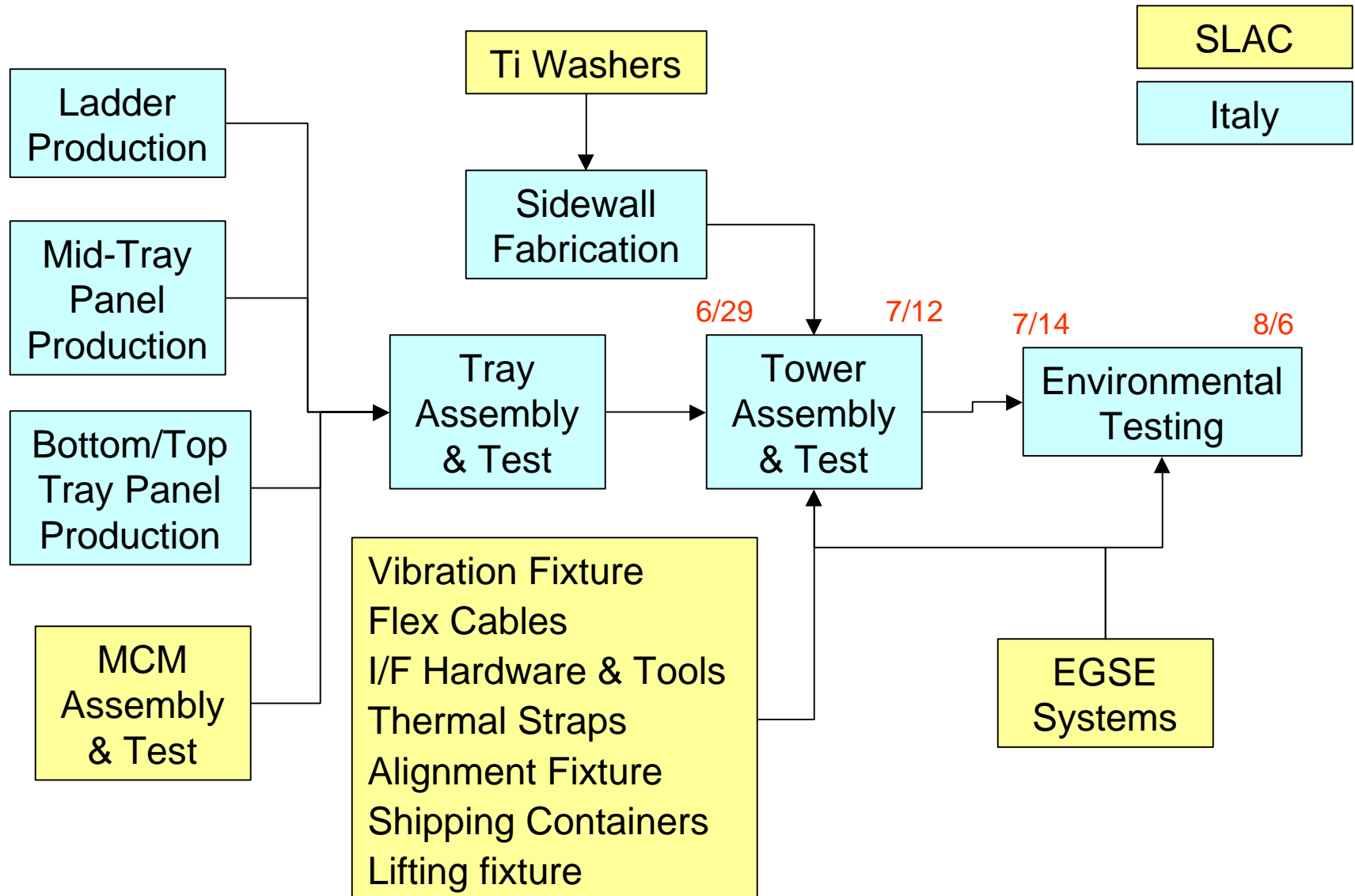
GLAST Large Area Telescope: Tracker Subsystem WBS 4.1.4

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LAT Tracker Subsystem Manager

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Tower-A Production Flow



SLAC

Italy

Ti Washers

Sidewall Fabrication

Ladder Production

Mid-Tray Panel Production

Bottom/Top Tray Panel Production

MCM Assembly & Test

Tray Assembly & Test

Tower Assembly & Test

Environmental Testing

Vibration Fixture
 Flex Cables
 I/F Hardware & Tools
 Thermal Straps
 Alignment Fixture
 Shipping Containers
 Lifting fixture

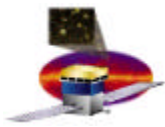
EGSE Systems

6/29

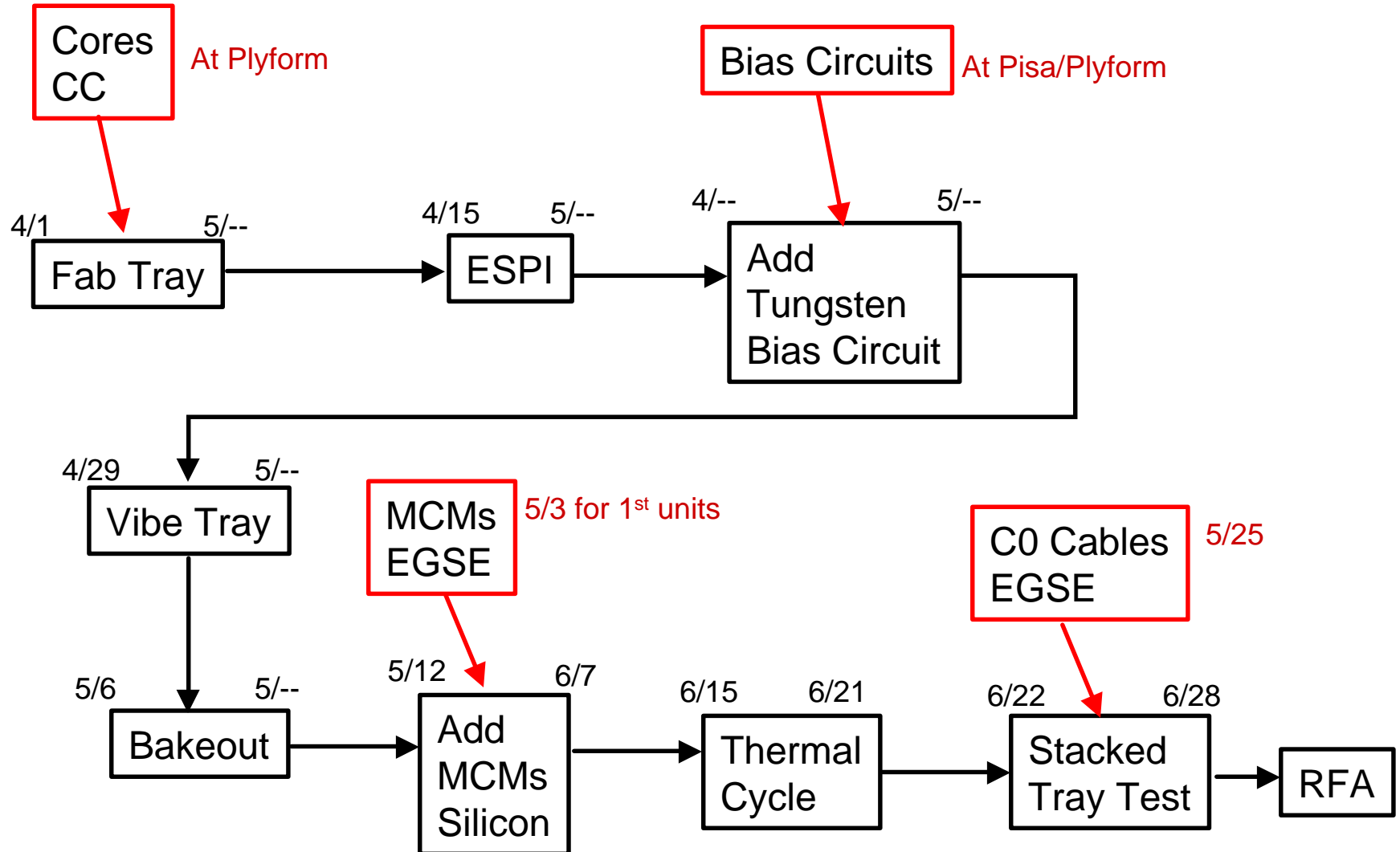
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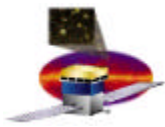
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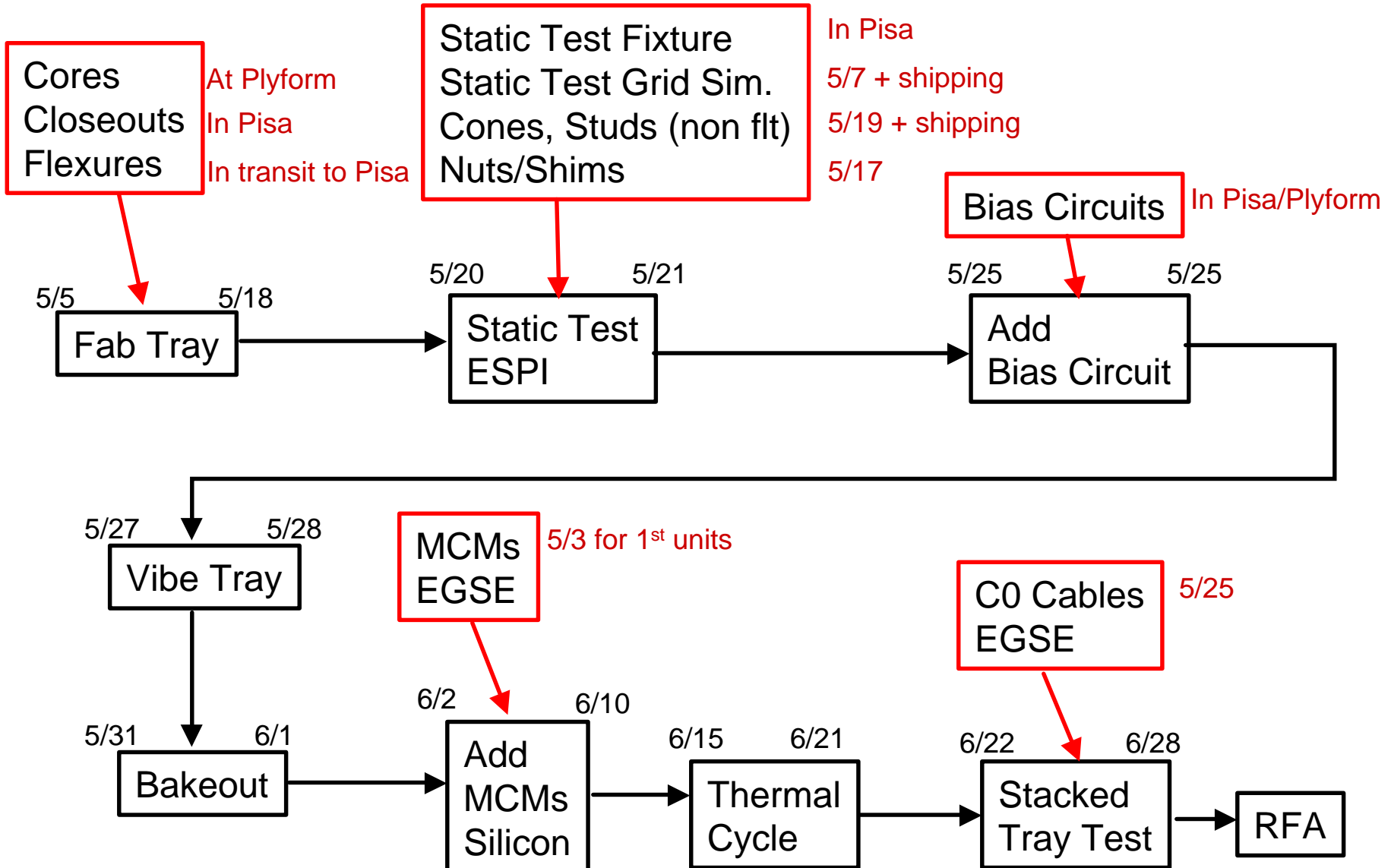


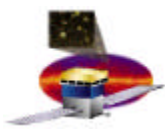
Tower-A Mid-Tray Production



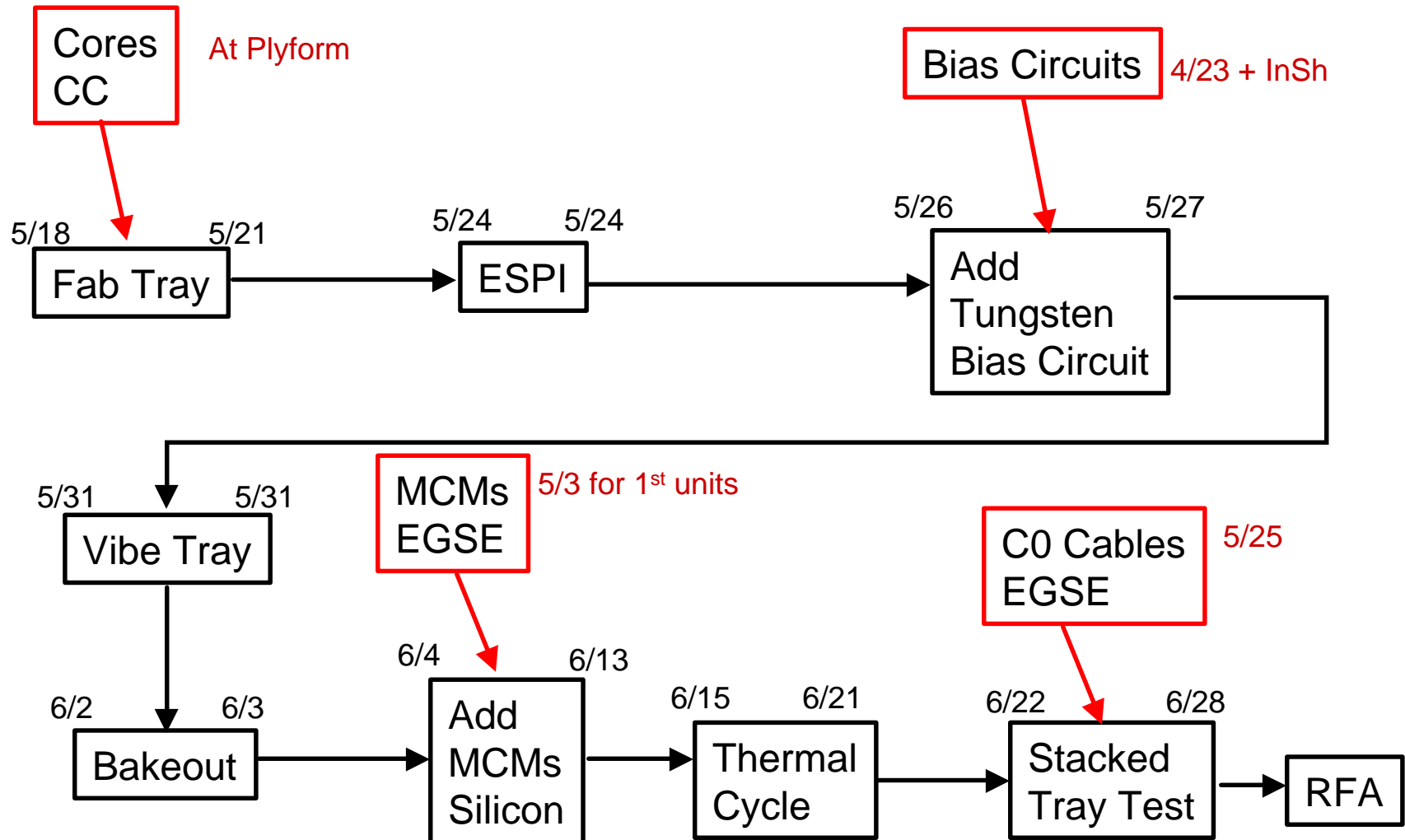


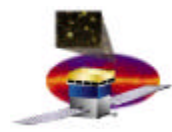
Tower-A Bottom Tray Production





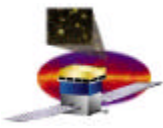
Tower-A Top Tray Production





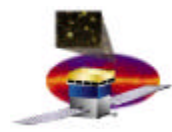
Tower-A Production Startup

| Item | Dates | Status | Open Issues |
|--|-------------------------------|--|-----------------------------|
| MCM Assembly at Teledyne | 23-Mar-04 to 7-May-04 | First 6 units delivered 23-Apr. 4 day slip in 2nd lot due to pitch-adaptor inspection issues, now resolved. >68 units are in progress. | IC rework frequency. |
| MCM Burn-in and Test at SLAC | 24-Apr-04 to 18-May-04 | Initial tests, thermal cycles, and 3-temp tests completed on the initial 6 units. Burn-in of these units is in progress. | |
| Mid-Tray Panel Fabrication at Plyform | Feb-04 to Mid May | Closeouts & Sandwiches assembled for >>1 tower. First several trays completed through ESPI testing. Tungsten and Kapton bonding to trays beginning this week. | |



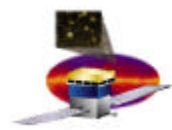
Tower-A Production Startup

| Item | Dates | Status | Open Issues |
|--|---|--|---|
| Titanium Parts at AMT | Tower-A parts in hand. | The first parts, for >2 trays, were delivered last week. Corrected on Monday for backwards installation of pin retainer. Hand carried to Pisa today. | |
| Interface Hardware (cones, studs, etc.), AMT | 19-May for 34 non-flight sets. Late for static test. | First 2 sets delivered last week. Preparing this week for strength tests on these. Flight drawings are in release. | Schedule. Can non-flight units be used for the 2 nd EM vibration test? |
| Static-Test Fixture | Needed in Italy by 17-May | The fixture and instruments were set up and tested on the EM tray last week. Procurement of a new base, for the new I/F is in progress. | Is a complete repeat of the qual test needed for the bottom tray? |



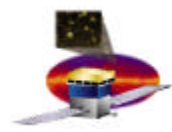
Tower-A Production Startup

| Item | Dates | Status | Open Issues |
|-------------------------------------|-----------------------------------|--|--------------------|
| Bottom Tray Closeouts at COI | Parts for Tower A in hand. | Production of all flight parts will conclude in a matter of days. PO is going out for some extra spares. | |
| Aluminum Cores (Plascore) | Tower-A parts are in hand. | Bottom tray cores for Tower-A will have to be trimmed. A new order of bottom tray cores is in progress for subsequent tower. | |
| Bias Circuits | Tower-A parts are in hand. | 1/2-oz Cu circuits have been in Italy for a month. Hopefully limit to non-flight trays. 1/4-oz Cu circuits were hand carried to Pisa yesterday. | |



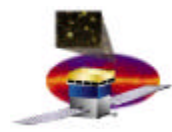
Tower-A Production Startup

| Item | Dates | Status | Open Issues |
|---|------------------------------|--|---|
| Bottom Tray Panel Fabrication at Plyform | 6-May-04 to 19-May-04 | Drawings are complete, with face-sheet and assembly drawings in release. 7075-T76 material was shipped to Pisa; insert machining can start now. Closeout and Tray assembly tooling is in production at G&A. PRR held today in Pisa. | Availability of the Grid simulator and I/F hardware for the static testing |
| Tray Vibration at Centrotecnica | Complete in late May | Ready to go, with considerable experience from the EM trays. Procedure document is in release. | |



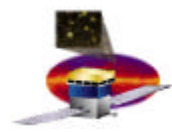
Tower-A Production Startup

| Item | Dates | Status | Open Issues |
|---|---|---|---|
| Tray Panel Vacuum Bakeout at Roma-II | Complete in late May | Fixture is ready in Roma-II. Procedure is under review this week in Pisa. | |
| Top Tray Panel | Need to start assembly by 18-May | Drawings are in release. Tooling drawings need to be completed and tooling machined at G&A. PRR this week in Pisa. | Schedule: tooling delayed by need to redo drawings at SLAC |
| EGSE Systems | | 1 new system was tested last week with the mini-tower. 2 new systems are being shipped to Pisa. | |



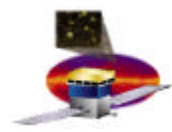
Tower-A Production Startup

| Item | Dates | Status | Open Issues |
|--|-------------------------------|---|---|
| Tray Assembly at G&A | 12-May-04 to 14-Jun-04 | Tooling for ladder mounting is ready to go. Tooling for MCM mounting is ready, and testing with preproduction MCMs and mockup trays is starting this week. PRR tomorrow in Pisa. | Assembly drawings need some update and re-release. |
| C0 EGSE cables for stacked tray testing | 25-May-04 at SLAC | On order from Parlex for 6-week delivery. | Worries about Parlex schedule performance. |



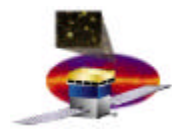
Tower-A Production Startup

| Item | Dates | Status | Open Issues |
|-------------------------------------|---------------------------------------|--|--------------------|
| Tray Thermal Cycles in Terni | 15-Jun-04 to 21-Jun-04 | Equipment is ready to go. The procedure is under review for release. | |
| Stacked Tray Testing | 22-Jun-04 to 28-Jun-04 | Mechanical test stand is in Pisa. Cables on order from Parlex. Micro-D jumpers in Pisa. EGSE system on the way. Scripts are in work and getting close. TRR this week in Pisa. | |



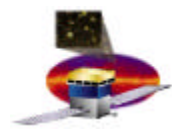
Tower-A Production Startup

| Item | Dates | Status | Open Issues |
|--|----------------------------|---|---|
| Sidewall Fabrication at Plyform | Needed by 25-Jun-04 | Prepreg is on order from COI. Drawings are in release. Assembly specs are under review. Ti washers are at SLAC, but a new design for thinner parts, to increase tower clearance, is in release. | Thinner Ti washers won't be in time for Tower A |
| Flex-Circuit Cables from Parlex | Needed by 25-Jun-04 | Drawings of 8 cables types are complete but need engineering review and release. | Manpower to complete the review. Urgent to get the PO out. |



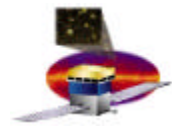
Tower-A Production Startup

| Item | Dates | Status | Open Issues |
|----------------------------------|---------------------------------------|---|---|
| Tower Assembly and Test | 29-Jun-04 to 12-Jul-04 | Assembly fixture is ready. Test scripts are in progress. Procedure documentation is in progress. | |
| Heat Straps and Fasteners | Needed by 25-Jun-04 | Design is in work to update for flight production. | Clearance of fasteners is being increased to prevent release of metal chips. |
| Vibration Fixture | Needed by 25-Jun-04 | Design is in progress. Need resolution of Grid bushing issue. | Is a steel bushing required in the Grid? Tight schedule. |



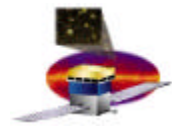
Tower-A Production Startup

| Item | Dates | Status | Open Issues |
|----------------------------|--------------------------------|--|--|
| Shipping Containers | Needed by 1-July-04 | Redesign of the Inner Container is in Progress. A new outer container will be procured with a better fit and with attachments for pallet. | |
| Lifting Fixture | Needed by 25-Jun-04 | A new fixture is under design, to accommodate the new top tray design and alignment top hat. | Prevent distortion of the top tray. |
| Alignment Top Hat | Needed by 1-July-04 | Design in progress at SLAC. Needed at time of tower assembly, so that CMM measurements can be made while still in Italy. | Tight schedule |



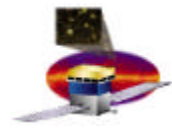
Drawings in Progress

- **Top/Bottom Tray Panels (including flexures)**
 - All drawings complete and either released or in release, except top-tray assembly drawing is in progress.
 - Discussions in Italy this week may result in some modifications of tolerances.
- **Mid Tray Panels**
 - Assembly drawings for closeouts and panels are being redlined in Italy to include all dimension lines and tolerances according to actual inspections in progress.
 - Update and re-release at SLAC will be required.
- **Tray Assembly (Bonding MCMs + Ladders to tray panels)**
 - Dimensions & tolerances are being redlined in Italy to correspond to new tooling & assembly methods at G&A, after which drawings will be updated at SLAC and re-released.
- **Sidewall Drawings**
 - In release, but discussions in Italy this week regarding alignment pin holes will result in small modifications.



Drawings in Progress

- **Flex-Circuit Cables**
 - Drawings need final engineering review and then will be ready for release.
 - Plastic retainer clips are new and not yet designed.
- **Interface Hardware**
 - Drawings are ready for release pending confirmation of design next week by assembly and pull testing.
- **Tower Assembly**
 - New engineering team has not gotten to this drawing yet, so it needs still a lot of work and checking before being ready for release.
- **IDD**
 - Release still pending resolution of bushing issue and final checks of flex-circuit cables.
- **SSDs, Ladders, MCMs, Bias Circuits: all released and final.**



Schedule & Cost Variance

- **March: schedule variance of $-\$106\text{k}$**
 - MCM production delays (no flight MCMs completed in March).
 - Delays in completion of bottom tray Ti parts and closeouts.
- **Cumulative: schedule variance of $-\$540\text{k}$ from $\$12,027\text{k}$ budgeted cost of work scheduled.**
 - This primarily reflects actual delays in starting the fabrication of flight electronics and delays in bottom tray parts.
 - Bottom tray parts will catch up in the next few weeks.
 - MCM production should be faster than tower production and therefore will move off the critical path, but it will not catch up with the MCM schedule in the PMCS (a CCB would be required to correct this variance prior to MCM production completion).
- **Cumulative Cost Variance: $\$108\text{k}$**