

Status Summary
Of
TERRA Mission Operations
And
AQUA Mission Preparations

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TERRA General Mission Status

Continued nominal mission operations with very few problems. Only identifiable failure is Circuit # 10 in the S/C Solar Array, likely due to a shunt resistor. This is only 1 circuit out of 24, and has not impacted operations to date. A detailed failure investigation is still in progress.

Still experiencing radiation events in High Gain Antenna motor drive assembly (MDA), Earth Sensors, and Star Sensors - mostly when passing through the South Atlantic Anomaly. No noticeable impact to mission operations so far.

To date, the only impact from the recent high solar activity has been slightly more frequent drag makeup maneuvers. No identifiable effects on CERES instrument operations.

Still an occasional loss of data, mostly from the high-rate instruments, and some delays in delivery of science data to the DAACs. (DAAC personnel and/or DMO personal can probably give you more specific information.)

CERES Mission Operations

CERES instruments continue remarkably trouble-free ops; no identifiable problems with either instrument.

Have not had any noticeable effects from the recent high levels of Solar flare events.

Interchanged primary instrument modes Feb 1, and again on May 1; CEF currently in Crosstrack, CEA in Biaxial.

Acquired gimbals performance data for CEA on 1/31 and 4/30; For CEF on 2/1 and 5/1.

Refining special lunar scan profiles so full observations can be made without risking scans too close to the sun. Tricky part is making mode transition in a manner that avoids the bridge balance resets in which we lose 25 data scans.

Recently conducted special scanning targeted at the local Chesapeake Light. They were generally successful, but we are still tuning the process to avoid Bridge Balance resets.

Instruments can accommodate a variety special activities, but they typically take a lot of careful planning to implement.

The IOT needs as much advance notice as you can give us.

Terra Command Scheduling Process

Terra stored command loads run from 20:00:00 GMT one day to 20:00:00 GMT the next day. (4:00PM to 4:00PM EDT)

First attempt at uploading a command file is 4 hours ahead of its start time – 16:00 GMT, or 12:00Noon EDT.

Load building starts today at 16:00 GMT (12:00N EDT) for the load that will start running at 20:00 GMT tomorrow.

All our scheduling has to be done prior to 16:00 GMT – that is 28 hours ahead of when the load actually starts on the S/C.

It takes 28 hours to get the load built, review it, make any late changes or corrections, and load it to the S/C to be ready.

This is under nominal circumstances, when you are only using already defined activities or procedures that are under Configuration Management(CM) and resident on the Mission Management Subsystem (MMS).

For these ‘normal’ activities, you really need a minimum of 48 hours notice of a desired change. (The MMS system is still subject to unanticipated crashes, and is routinely ‘recycled’ as a preventive measure.) We try to stay a week ahead.

Terra Flight Operations Constraints

No raw commands are allowed; commanding can only be done via a real-time procedure, or as a S/C stored command.

(On TRMM we could ask the test conductor to manually send any command that was in the validated database.)

Any real-time proc must be under CM, and reside in the ON-LINE Ops system to be called by the Operations Controller.

Approval to run a real-time proc must be requested via a Pass Plan Change Request, and approved prior to the pass during which it will be executed.

If the desired time does not occur during a planned contact time, a special TDRSS pass must be requested 24 hours ahead.

Stored commands can only be built using established Activity Definitions that are under CM control, and resident on MMS.

Any nominal MMS scheduling must be done 28 hours ahead.

Terra Configuration Management Submittal Process for New Activities and Procedures

New submittals for CM Board review must be in the system by Noon on Monday of any given week. (Board meets on Wed.) If the Board approves the item, it will usually be ingested into the MMS or On-Line systems and be useable by Friday. Before you can submit a new Proc or Activity, you have to write or define it, test it against the CERES simulator, and test it against the EOS spacecraft simulator. (takes about a week.) If it involves a S/W load to the CERES instrument, back that up another 3 or 4 days to get it built and tested. The bottom line is that it takes nominally 2 weeks (8 hours/day, 5 days/week) to plan and implement a new CERES activity so it can be scheduled on any given day. Obviously, in an emergency, it can be done in less than that, but we just need to try to anticipate the things we want to do so we don't have to cry 'Wolf' if we don't have to.

TERRA Deep Space Cals Are Still Coming !!

They are over the rainbow, right next to the pot of gold !!

EOS Project Office is still working with the Aster/Japanese Officials to get their concurrence to proceed. Had expected to do them before now, but diplomacy often moves slowly.

(Even more slowly than the EOC/FOT CM processes.)

GSFC FOT has done all the simulation studies required, and have a preliminary maneuver timeline developed.

Final planning only requires HQ approval, and an actual date established so FDF products can be generated.

LaRC IOT and science reps still need to finalize the set of scan sequences that the instruments will run.

These final sequences will be loaded to the instruments and given a test run prior to the actual pitch maneuvers.

AQUA Mission Planning

First major end-to-end test between GSFC/EOC and S/C was conducted Mar 12-13; at least one test case of each CERES early orbit checkout proc was run live against the S/C and instruments from the GSFC EOS Ops Center (EOC).

Mission Test #1 was conducted on April 24; the first end-to-end test of nominal mission operations using automated builds of stored commands. (Major S/C & FOT milestone.)

CERES operations during both these tests were nominal with no identifiable problems. (There were some S/C glitches, but TRW and the GSFC/FOT are much improved now.)

CERES portion of EOC Command and T/M database is mostly complete; we did find a missing conversion of commanded azimuth angles to counts for the instrument (DR submitted).

NOTE: We are making CERES operations on Aqua as nearly identical to Terra as possible; we anticipate that the Science Team will want to do similar special ops, and are starting to replicate the special activities we are doing on Terra.

Aqua Integration and Test Milestones

Dry run tests from GSFC EOC of procedures that will operate Spacecraft mechanisms that deploy the CERES instruments.	5/8/01
S/C Systems level CPT (all flight config)	5/24 – 6/4/01
Thermal Vacuum Test	6/29 – 8/9/01
Mission Test #2	8/15-8/17/01
Final tests of mechanisms that deploy CERES	8/31-9/4/01
S/C Interface test #4 & Post T/V CPT	9/19-10/1/01
Ship S/C to Western Test Range (WTR)	10/26/01
Post-ship CPT & SCIF #5	11/2-11/13/01
Move to Pad & Mate to launch vehicle	12/3-12/4/01
Final Aliveness Tests	12/7/01
Aqua Flight Readiness Review	12/17/01
WTR Launch Readiness Review	12/19/01

Planned Launch Date

December 20, 2001

(Not yet approved by NASA Headquarters)