

To: tgs_staff

From: Carey Myers

Date: December 18, 2003

Subject: Minutes of 12/17/03 TGS Project Meeting

Attendees: C. Darby, G. Chapman, S. Speck, S. Stallcup, M. Reinhart,
M. Giuliano, D. Jones, C. Myers, L. Foor, B. Boyer,
M. Galloway, R. Pitts, I. Dashevsky

```
*****  
*** Next Meeting: Wednesday, January 7, 2004 9:00 A.M. ***  
*** Location: Bloomberg B448 ***  
*** Topic: Design status, design issues, and action items ***  
*****
```

- Status from the TGSOWG meeting on 12/11/03:
 - FGS coarse track to fine lock testing – Initial Danbury tests are promising so far. They have been able to achieve fine lock with as much as 1000 msec jitter at 1 sigma. These results appear fairly consistent with the initial results coming out of the HST simulator. There will be additional Danbury testing through at least mid-January, using varying noise levels and frequency values.
 - The AutoMAP proposal written by Bob M. was presented at the working group meeting. The proposal was discussed and the working group concurred with the approach.
 - A PCS Peer review meeting was held on 12/17/03 to go over the M2G PCS mode. The review materials will be posted on the TGSOWG web page.
 - The magnetic field alignment impact on M2G mode was discussed at length. The PCS team is implementing an observer for M2G mode, which will keep the attitude error below 10 degrees (hopefully). They are tweaking gains and K-factors in an attempt to improve accuracy even further. For science purposes, 5 degrees is the magic number for attitude error (in roll), otherwise sky availability is severely limited, even in the CVZ. The recommendation to the STScI is to look into avoiding Type 2 slews during periods when the magnetic field is aligned within 15 degrees of the Gx axis (i.e. normal to the two-gyro plane). This will keep large attitude errors from translating into all three axes and will allow the M2G controller to maintain a smaller attitude error profile.
- Status from the TGS Project Status Review held at GSFC on 12/15/03:

- All teams presented their current status, key upcoming dates, and issues.
- A majority of the meeting was spent discussing the M2G mode performance and its affect on scheduling.
- The STSci was asked to provide an impact assessment by the end of January (in terms of requirements and schedule) for incorporating a magnetic field modeling tool in SPSS and using it to constrain slews during periods of bad magnetic field alignment.
- For the remainder of the meeting, Merle and Scott Stallcup led the discussion on the impact to SPSS of the magnetic field alignment in M2G mode. The following points were made:
 - The magnetic field modeling computations are not overly complicated, and Scott stated that he could incorporate them into his Phase I work.
 - Scott also felt that it would be useful, before incorporating magnetic field modeling into the SPSS scheduling algorithm, to develop a post-analysis tool that could be used to analyze a calendar that has been built to determine the degree to which magnetic field alignment problems occur. Then, if the number of occurrences were small, manual steps could be taken to correct the calendar. If the post-analysis tool could be developed during Phase I, this might be a reasonable first-step solution.
 - Both of the above items could be worked on without impacting the ongoing SPSS Phase I design and implementation.
 - Incorporating the magnetic field modeling into the SPSS scheduling algorithm is a much more difficult problem, and probably can't be done in Phase I without impacting the initial TGS capability we're trying to develop.
 - Merle mentioned that the station-keeping slews that are scheduled during initial calendar building might be a problem. We may need to select a different fixed target or go to a moving target scheme. He (or Scott) will file a PR to address this issue.
 - The group discussed ways to minimize time spent in M2G mode. Scott Speck suggested that one thing we can do, as part of the current design, is to link the Type 2 slew with the initial FHST rate control activity, treating them as a single scheduling entity. This will ensure that we go directly into T2G mode immediately after the Type 2 slew.
- Updated statuses of the TGS issues and action items are attached below.

Attachments

TGS Issues

TGS Action Items

TGS Issues

- Handling of Type 2 slew FHST shutter/availability commanding.
 - Status: Closed 12/03/03
 - 11/12/03 - The OBADWG has concluded that the Type 2 slew command group should remain essentially unchanged, i.e. the command group will continue to command the FHST shutters closed (thus forcing M2G mode), regardless of the length or magnitude of the slew and regardless of FHST visibility during the slew. This means PASS needs to 1) turn off FHST availability (and close the FHST shutters?) prior to the Type 2 slew (maybe as part of the PCPTERM group?), and 2) open shutters and turn on availability at the beginning of FHST visibility only if we're not slewing.
 - 12/03/03 – Using the Autogroup feature, PASS will issue FHST shutter and availability commanding based on FHST visibility windows. PASS will adjust FHST visibility windows to not overlap Type 2 slews.

- Placement of Type 4 slews.
 - Status: Closed 11/12/03
 - 11/12/03 - SPSS will only schedule Type 4 slews between the second OBAD and the GSACQ. SPSS will limit the slew magnitude to .5 degrees.

- FHST maps/automaps.
 - Status: Closed 12/11/03
 - 11/12/03 - A suggestion from J. Wirzburger is to command an OBAD (map only, without an attitude correction). R. McCutcheon will assess how PASS would command this, including limiting the duration of the map (see Action Item list).
 - 12/03/03 – Bob M. wrote up a proposal for commanding FHST MAPS and AutoMAPS in two-gyro mode. The proposal was reviewed by the TGS project team and will be sent to the FSW and PCS groups for concurrence.
 - 12/10/03 – Proposal sent to FSW and PCS groups for concurrence.
 - 12/11/03 – Concurrence received at TGSOWG meeting.

- Is the second OAD always required?
 - Status: Closed 12/03/03
 - 11/12/03 - Consider adding a SCHF parameter to make the second OAD optional (for SPSS scheduling and PASS checking). The problem is more complicated than that, but at least this would give us a simple way in Phase I of turning the second OAD off.
 - 11/19/03 – Added a SCHF parameter to the proposed ST-ICD-26 updates to make the second OAD optional.
 - 12/03/03 – SPSS and PASS will use the SCHF database parameter to make the second OAD optional. The need to make it optional in SPIKE will be assessed later, if necessary.

- FHST/GOB – Is it required and how does it work?
 - Status: Open

- 11/12/03 - No new information.
- 12/03/03 – The current understanding is that SPSS/SCS will generate an FHST GOB statement in the SMS at a database-specified time (could be 0) before the guide star acquisition. The statement will, optionally, specify the FHST to use during the first part of the guide star acquisition. It will also, if required, put the FHST in observer mode.
- Earth Calibrations.
 - Status: Closed 11/12/03
 - 11/12/03 - SPSS will schedule them in two-gyro mode in a similar fashion to how they are currently scheduled, using M2G pointing constraints.
- Magnetic field modeling in SPSS
 - Status: Open
 - 12/10/03 – Need to understand the problem better and generate requirements so we can evaluate impact to the SPSS scheduling algorithm. A magnetic field modeling tool may benefit PASS and SPIKE as well.
 - 12/17/03 – Magnetic field modeling could be done in SPSS in Phase I. However, it would probably be used initially to support a calendar post-analysis tool as opposed to being incorporated into the SPSS scheduling algorithm directly.

TGS Action Items

- 12/03/03-1 Meet with H. Wynn to discuss PASS options for HGA scheduling in two-gyro mode.
Assignee: M. Galloway
Status: Open
12/10/03 – Needs to be addressed before the Design Review.
- 12/03/03-2 Evaluate changes needed for Health and Safety SMSs in two-gyro mode.
Assignee: Commanding, Ops
Status: Open
12/10/03 – Merle will coordinate next Spring.
- 12/03/03-3 Resolve with J. Reis whether the Star Catalog should be documented in HST-ICD-T1.
Assignee: C. Myers
Status: Closed 12/17/03
12/10/03 – Carey will follow-up on this at the 12/11 TGSOWG.
12/17/03 – At the 12/11 TGSOWG, John Gainsborough confirmed that he had talked with Jim Reis and that Jim was satisfied with documenting the Star Catalog in HST-ICD-T1.
- 11/19/03-1 Talk to PRD group (M. Bielefeld) about philosophy for PDB updates, IMTOOL changes, and whether quick updates can be supported.
Assignee: C. Myers
Status: Closed 12/03/03
12/03/03 – Merle reported after talking with Mike B. that the PRD group can track multiple sets of constraint parameters using database versions and can switch sets using their quick update procedures.
- 11/19/03-2 Incorporate the discussed changes into the proposed ST-ICD-26 updates, i.e. three values for the OAD times instead of two, and a single set of uncertainty pads (small, medium, and large) instead of pads for each constraint parameter.
Assignee: M. Galloway
Status: Closed 12/10/03
12/03/03 – Mary provided a revised update to ST-ICD-26, Part 2 that incorporates the described changes. After making a few final wording changes, the ICD should be ready for review.
12/10/03 – The ICD update is complete and ready for review.
- 11/12/03-1 Review Gx values provided by D. Smith and assess how the various gyro combinations constrain the scheduling system.
Assignee: M. Reinhart
Status: Open

11/19/03 – Merle discussed this further with Dan Smith and feels this may become an issue, particularly in regards to whether steps should be taken to ensure that gyro 1 is one of the last two working gyros. Merle will write up his assessment.

12/03/03 – Merle wrote up an initial assessment of the constraining effect of various gyro combinations on the scheduling system. However, after receiving some new information, Merle wants to study this issue further.

12/10/03 – This may have more to do with the mag field modeling in SPSS than with particular gyro combinations. More evaluation is needed.

11/12/03-2 As an aid in reviewing ST-ICD-26 updates, extract the relevant sections of the SCHF and CRPF PDB files for each parameter being updated for two-gyro mode in order to provide current value and origin information.

Assignee: R. McCutcheon

Status: Closed 11/19/03

11/19/03 – PASS provided handouts of the proposed ST-ICD-26 updates (FROM/TO pages) along with a handout of the relevant information extracted from the SCHF and CRPF PDB files.

11/12/03-3 Review additional SCHF parameters, such as slew settle times and GSACQ times, to see whether the current operational values are OK for two-gyro mode.

Assignee: R. McCutcheon

Status: Open

11/19/03 – Bob M. looked at additional SCHF parameters, but won't know whether the values are appropriate for two-gyro mode until PCS provides firmer definitions.

12/10/03 – Waiting for PCS definitions.

11/12/03-4 Identify all basefile parameters in TRANS, SPIKE, SPSS, and PASS that may need to be changed for two-gyro mode and trace each parameter back to its source (e.g. CARD, PDB).

Assignee: M. Reinhart (with support from the teams)

Status: Open

11/19/03 – PASS provided Merle with a handout of existing Mission Scheduler basefile parameters, noting any that may be impacted by two-gyro mode.

12/03/03 – Merle hopes to have a complete list by the end of the year.

11/12/03-5 Determine need dates for definition of FHST and GSACQ PLCPs, including their parameter and scenario definitions.

Assignee: All

Status: Closed 12/03/03

11/19/03 – The teams agreed that the PLCPs need to be defined by 3/1/04. PASS will provide a first-cut definition of what they think is needed by 1/1/04 and we'll push for a commanding subgroup (off of the TGSOWG

or the OBADWG) to finalize the definitions by our need date. Carey will forward this plan and schedule to the TGSOWG.

12/03/03 – Carey provided the following dates to project: 3/01/04 for design of FHST PLCPs and 6/01/04 for design of GSACQ PLCPs. These dates will be added to the project-level schedule and tracked as scheduling system need dates.

11/12/03-6 Determine how PASS would issue, and limit the duration of, FHST maps and automaps using an OBAD without attitude correction.

Assignee: R. McCutcheon

Status: Closed 12/17/03

11/19/03 – Discussion on whether SPSS should issue the current FHST MAP statement in the SMS which PASS would turn into a map-only OAD, or whether SPSS should issue a FHST OAD statement in the SMS with a map-only parameter set (requires an additional minor change to ICD-11). Bob will write up a proposal (with options) for evaluation.

12/03/03 – Bob wrote up a proposal, which the group reviewed. After a few updates, the proposal will go to FSW and PCS for concurrence.

12/10/03 – Bob sent out proposal for review. Need to complete update to ICD 11.

12/17/03 – At the 12/11 TGSOWG, Bob's proposal was discussed and approved.

11/12/03-7 Provide comments on draft scheduling system requirements document.

Assignee: All

Status: Closed 12/10/03

11/19/03 – Comments received and reviewed on the SPSS/SCS and PASS sections of the document. Updates incorporated. The updated requirements will be sent out for final review next week.

12/03/03 – The scheduling system requirements document is out for review. Comments are due by 12/05/03.

12/10/03 – Several sets of comments received and incorporated into document.