

To: tgs_staff

From: Carey Myers

Date: March 5, 2004

Subject: Minutes of 03/03/04 TGS Project Meeting

Attendees: C. Darby, G. Chapman, S. Speck, S. Stallcup, M. Galloway,
M. Giuliano, C. Myers, L. Foor, M. Bielefeld,
M. Boyer, A. Vick, R. Pitts

*** Next Meeting: Wednesday, March 10, 2004 9:00 A.M. ***
*** Location: Bloomberg B448 ***
*** Topic: Issues, action items, status ***

- Mike B. reported that Art Bradley had delivered 9 PLCP groups to support changes to the #32 command for two-gyro. They are part of PDB 6.4, which needs to be in place for the on-orbit test scheduled for April 19-23.
- Mary G. reported that comments had been received on the ICD T1 and ICD 11 DCRs. The changes have been incorporated and are available on the PASS web site. Carey will update the TGS web page to point to the latest versions. Mary is still awaiting comments on the ICD 26, Part 2 DCR.
- Mark G. asked whether the second OBAD could overlap the GSACQ. The consensus of the team is that it cannot, because the attitude correction portion of the OBAD (which is a slew) would interfere with the first part of the GSACQ (which includes a centerline slew).
- Several new issues were discussed relating to the GOB overlap with the GSACQ and the FHST availability pad at the end of FHST visibility. See open issues attached to these minutes.
- Mary G. asked whether the slew rate parameter should be allowed for Type 5 slews in TGS mode. Merle will research it.
- Scott Stallcup reported that SPSS development is ahead of schedule and that they are able to schedule SUs in two-gyro mode, including multi-orbit SUs. They may also insert a build between builds C and D to refine the magnetic field model.
- George C. reported that they had completed test runs using both shortened OADs and longer OADs (+/- 2 min.). They also had results showing weekly target availability and are setting up runs using longer science visits. They expect to meet with Rodger within the next week or so to go over their results to date.

- Mark G. reported that they have succeeded in removing some of the false positives in the SPIKE SAA modeling code. They are turning their attention to improving SPIKE performance.
- Mary G. reported that Bob McCutcheon would be leaving the team, effective May 1.
- Attached are the open action item and issues lists. They are also available on the TGS Project web page: http://www.stsci.edu/org/ess/projects/two_gyro_science

Attachments

TGS Open Issues

TGS Open Action Items

TGS Open Issues

- SPSS will avoid a bad magnetic field alignment when scheduling Type 2 slews and establishing initial rate control. But how do we avoid FSW locking in a bad attitude error when it is autonomously transitioning from M2G to T2G mode in the absence of a Type 2 slew (e.g. following an uncovered SAA occultation)?
 - Status: New
- FHST handoffs should be allowed from start of GSACQ until start of FGS visibility.
 - Status: Open
 - 03/03/04 – SPSS should use the existing scenario parameters to delay the start of the FHST GOB until FGS visibility begins. This will allow normal systemic single FHST coverage from the start of the GSACQ until the start of FGS visibility, thus allowing for FHST handoffs. Eventually, we should remove the GOB time offset parameter from ICD-26, Part 2 (maybe as part of the mag field parameter update).
- Delta time for turning off FHST availability before end of FHST visibility should be parameterized.
 - Status: Open
 - 03/03/04 – New availability pad parameter: TGS_FHST_AVLEND_PAD needs to be added to the SCHF. Availability/shutter PLCPs should be separate PLCPs to allow use of the pad parameter when commanding the FHSTs.
- Calculation of FHST visibility windows, systemic FHST coverage, and overlap of FHST visibility with FGS visibility should use FHST availability times, not FHST visibility times.
 - Status: Open
 - 03/03/04 – For the purposes of calculating FHST visibility coverage, the FHST visibilities will be shortened by the availability end pad amount.
- Two-gyro mode flags (Design Review action) - Make flags multi-state vs. two-state to support potential future modes (one-gyro?)
 - Status: Open
 - 02/18/04 – Two-state flag is already implemented in SPSS (Build 46.0) and PASS, as well as in DCR 5065 to ST-ICD-26, Part 2. The change to make it multi-state is relatively easy, and can be done in conjunction with other changes to the database parameters to support future modes, if and when they are needed. Recommendation is to leave as is for two-gyro mode.
 - 03/01/04 – Discussed at TGSOWG. L. Dunham agrees that flag can remain as is and that there is no need to change ST-ICD-26, Part 2. Carey will write response to Design Review action item.
- Are there internal risks that the Scheduling Systems should identify that might impact the TGS Project?

- Status: Open
- 02/18/04 – Risks related to science schedulability and types of science that can be supported in TGS mode should be added. The HST Project is requesting that we use their format for defining / tracking risks and that we present our risks at the Project CDR.
- 02/25/04 – Carey discussed additional risks with Rodger. Carey will write up and review with Rodger, then put risks into Project-defined format.
- Are there additional variations that should be considered in the science impact studies?
 - Status: Open
 - 02/18/04 – Potential variations include using different LAU values, varying the timing of activities, varying the number of science minutes / orbit, and showing the usable part of the sky by date.
 - 03/01/04 – Rodger would like to present findings to the TGSOWG in the April-May timeframe as a checkpoint prior to the Project CDR, and then decide what, if any, additional analysis would be helpful.
- Dog-leg slews / two-part slews
 - Status: Open
 - 2/18/04 – Can they be used to avoid sun constraint or mag field constraint, e.g. by slewing part way to target, waiting for the constraint to pass, and then finishing the slew to the target? Although that capability exists for avoiding the sun constraint, it is not efficient for avoiding the mag field constraint due to FHST visibility requirements.
 - 03/01/04 – The TGSOWG agrees that this is not a priority item. It should be a potential enhancement for Phase II if scheduling around the magnetic field is a problem.
- Definition of new PCS scenarios
 - Status: Open
 - 02/18/04 – Merle and Alan are defining them. It looks like there will be two new acquisition scenarios: base1t and base1tns.
- Loss of lock strategy - Is there any effect on scheduling?
 - Status: Open
 - 02/18/04 – The number of loss of lock occurrences is expected to be so low that there shouldn't be any effect on scheduling. The scheduling systems will schedule for success and if there is a loss of lock, the schedule will get back into synch with the next set of OBADs.
 - 03/01/04 – The only concern is during CVZ operations, when a target may be observed for many consecutive orbits without intervening OBADs. In this case, a loss of lock could impact a lot of science. However, the likelihood of uncovered SAAs helps mitigate the likelihood of this happening.
- Magnetic field Gx vector parameters in the PRD
 - Status: Open

- 02/18/04 – Provide parameter values for all gyro combinations (six) in the PRD and add a flag in PRD indicating which set to use. Only the designated set needs to be populated forward into the PMDB.
 - 03/01/04 – The TGSOWG agrees with this approach.
- Is there a minimum time that you must be in the bad mag field alignment before scheduling is constrained?
 - Status: Open
 - 02/18/04 – It seems that it would be useful to provide a PRD parameter to define the minimum time, and to add a requirement to the Scheduling System to only constrain the schedule if the time during which there is bad mag field alignment exceeds the database parameter.
 - 03/01/04 – The TGSOWG agrees with this approach.
- Provide support for target reacquisitions using the save / restore quaternion feature
 - Status: Open
 - 02/18/04 – Test with ACS (can be done in 3-gyro mode). Add to Phase II work.
 - 03/01/04 – P. Coleman found the PLCPs that support this capability. Rodger suggested that we try to arrange a test in the May timeframe, and use the results to define requirements for a Phase II implementation.
- Impact to astrometry observations if the GSACQ fails.
 - Status: Open
 - 02/18/04 – This is an issue that must be resolved in the acquisition logic.
 - 03/01/04 – The TGSOWG took an action to deal with this during development of the FGS PLCPs.
- Type 3/4 slews and the use of the slew rate parameter.
 - Status: Open
 - 02/18/04 – The slew rate parameter is optional in the command template. Therefore, Type 3/4 slews can be supported in Phase I without specifying the slew rate parameter (no moving targets). In Phase II, the slew rate parameter can be specified for moving targets.
 - 03/01/04 – The slew rate will not be passed through in the SMS and is automatically set to 0.0 by the PASS software.
 - 03/03/04 – Is the slew rate allowed on Type 5 slews in TGS mode?
- 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.
 - 01/07/04 – C++ class being developed to implement IGRF model in SPSS.

- 01/14/04 – Carey met with the SPSS team to discuss the impact of adding a magnetic field modeling constraint to the scheduling system.
- 02/18/04 – The magnetic field requirements and initial design were presented at the Scheduling System Design Review on 02/12/04. Implementation of the IGRF model and a calendar post-analysis tool were added to SPSS Phase I builds. A SPSS build to implement mag field scheduling constraints was added to the end of Phase I.
- 03/03/04 – SPSS planning to add a switch to turn the mag field scheduling constraint on/off (will aid testing).

TGS Open 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.
02/18/03 – Mary talked to H. Wynn and they will hold meetings later in the Spring.
03/03/04 – Contact for I&C changed from H. Wynn to G. Goulet.
- 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.
01/14/04 – Bob McCutcheon generated a Health and Safety scenario diagram for two-gyro mode.
- 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.