f

meeting date *date de la réunion*	13-14/03/01	ref./*réf.* FIRST/FSC/MOM/0179		page/*page* 1 / 16
meeting place *lieu de la réunion*	RAL		chairman *président*	SV
minute's date *dates de minute*	23/03/01		participants *participants*	See appendix
subject/*objet*	**HGSSE #12 MoM**		copy/*copie*	

description/description	action/action	due date/date limite

O b j e c t i v e   &   A g e n d a

See SV's VG#1

There were the following comments on the proposed agenda:

Monitoring of ILT ICDs and UCs wrt to I/Fs (email from RH 07/03): Added to the agenda

Definition of dataframe: (email from PR 08/03 02:00): Added to the agenda to discuss the issue.

Definition of script language for CUS/IA (email from PR 08/03 02:00): Agreed that it was a CSDT item: WP #24112. The CSDT gathers all ICCs, so it should also take care of commonality aspects.

Configuration Control: Wrt HCSS agreed that it is a CSDT item. CC aspects with project/MOC (e.g. wrt mission database) fall under the HGSSE. However, no issues were identified for discussion at this meeting.

ObsId/BBId commanding (email from PR 08/03 09:34AM). Added to the agenda as part of the discussion on the ObsId/BBId TN.

R e v i e w   o f   A c t i o n s

AI#161100/1: no input, remains open.

AI#290101/1: Closed. Draft TN sent by PR on 14/02.

a

AI#290101/2: Closed for HIFI (email from Kees Wafelbakker on 08/02) , SPIRE (email from KK on 22/02). Open for PACS. RH sent an email dated 19/02/01 stating that PACS does not need the time shift capability. To formally close the action, OHB still needs to confirm.

AI#290101/3: Closed. Email from JD dated 20/02/01. Time shift not needed by MOC.

AI#290101/4**:** Closed. As part of AI#290101/7 inputs.

AI#290101/5**:** Closed. Email from JD dated 06/02/01. JD forwarded the S2K ICD applicable for the DSP OBSM.

AI#290101/6**:** Closed. Email from RH dated 13/02 and SS dated 21/02.

AI#290101/7**:** Closed. Email from PR dated 09/03, SS dated 09/03, RH dated 05/03, SV dated 16/02. JD closed the action as part of the IRD TBs discussion, see below.

AI#290101/8: Closed. Standard ftp will be used as the protocol between MOC/DDS and the HSC (NP). XFTS (based on ftp but allowing recovery of file transfer without re-sending file from scratch) used for XMM will not be used, as its set-up is too cumbersome (NP). The DDS will automatically re-send a file whose transfer has not been successful.

AI#290101/9: Closed. No input could be given on the additional field format could be given by JD. HSC and ICCs took an action to provide preferred field format to ESOC

⇨ **AI#130301/1: PR, RH, SS and SV to provide preferred TC field format to ESOC (JD). Due date 30/03.**

AI#290101/10: Closed: The implementation of the S2K generic TM I/F is planned as such:
- 2.2e Oct01: Implementation of the S2K generic TM I/F (basic generic TM packetizer).
- 3.0 Jun02: Advanced implementation (PUS services).

It was not clear what the status was wrt the possibility to interface with S2K at TM packet level (versus frame level). NP took an action to clarify.

⇨ **AI#130301/2: NP to clarify S2K implementation schedule for generic TM I/F at TM packet level . Due date 30/03.**

As part of the discussion, JD also mentioned that an updated S2K development plan defining the main new features will be made available on 17/03. NP will forward it to all members of the group.

H G S S E   d o c u m e n t s   u p d a t e s

FGS-DD:

All RIDs from the SRR review have been answered/agreed. SV pointed however to RID SR-CCB-87 on which there is still an open comment from RH. The RID is about the retransmission of frame lost in the space/ground link.
JD clarified that the maximum data loss rate is estimated (from past missions) at 2% or approximately 30' over an OD. The pattern for TM drops is by period of 10-20 frames. ESOC clarified that data could be recovered on a case by case basis (at the next DTCP provided that data are not overwritten in the SSR, which could be the case if data are at the start of the previous OD). However, JD stressed that MOC does not intend to recover lost data automatically and systematically.
A discussion took place on whether MOC could identify missing scientific data frames. The answer is yes as MOC will have to open scientific packets to sort them according to APID. This is important: in routine phase, HSC may not be able to check for missing science data packets before the next DTCP.
Beyond these clarifications, it was agreed that the actual requirement on recovery of TM drop is up to the PS.

The TBs in the FGSDD have not been discussed, only PR has provided inputs. They are for discussion at the next meeting.

FGS-IRD:

The SRR RIDs on the FGS IRD are all answered/agreed.

Following SRR recommendation and AI#160101/7, the TBs (TBCs, TBDs and TBWs) of the IRD were reviewed. The review followed SV's input dated 16/02.

1. MOC->FSC control flow (TBC):

3.1-130 [S/C predicted orbit data]
3.1-160 [S/C attitude constraint algo]
3.1-190 [S/C slew time and path predictor algo & data]
3.1-220 [planning skeleton] "R"
3.1-280 [mission timeline summary] "R"
3.1-320 [TC history] "R"
3.1-360 [S/C reconstituted orbit data]
3.1-390 [attitude history data] "R"

It was agreed that MOC would notify the HSC for non-regular data only. For regular data, HSC will systematically poll the DDS. Regular data are marked with an "R" (see above). For attitude history data,

only the first release for a given OD is meant to be regular. MOC will notify the HSC of any subsequent update made available.

In all cases, the HSC will pull the data from the MOC.

2. MOC->FSC control flow (TBW):

3.1.6.2 [observations schedule status information] "R"
3.1.14.2 [instrument memory image]
3.1.15.2 [S/C and instrument databases reference]
3.1.16.2 [instrument aperture misalignment reference data]
3.1.17.2 [SSO database reference]
3.1.18.2 [S/C general information]
3.1.19.2 [instruments mal-functions or operation problems]

Same comment/agreement as above.

3. MOC-> FSC performance requirements (TBW)

3.1.3.3 [S/C attitude constraints algo & data]
3.1.4.3 [S/C slew time and path predictor algorithm and data]
3.1.6.3 [observations schedule status information]
3.1.7.3 [mission timeline summary]
3.1.9.3 [reconstituted S/C orbit data]
3.1.14.3 [instrument memory image]
3.1.15.3 [S/C and instrument databases]
3.1.16.3 [instrument apertures pointing misalignment]
3.1.17.3 [SSO database]
3.1.19.3 [instruments mal-functions or operation problems]

The following was agreed:

3.1.3.3: N/A
3.1.4.3: N/A
3.1.6.3: N/A
It was agreed that performance requirement regarding scheduling in the ground segment were not relevant. Scheduling operations should be subject to a detailed operational scenario defining the different scheduling cycles (Routine and PV).
3.1.7.3:
It was agreed that the delivery of the mission timeline summary mainly makes sense in test and commissioning the instrument engineers to follow the on-board operations. After execution of the mission

timeline, information on what exactly happened on board can be found in the TC history. The following requirement was therefore agreed:

The MOC shall make available the mission time line summary before its actual uplink to the S/C.

Regarding the actual content of the mission timeline summary, NP took an action to forward an example ICD.

⇨ **AI#130301/3: NP to send example ICD of mission timeline summary. Due date: Next meeting.**

3.1.9.3: N/A

[SV's post meeting comment:refelecting on this one, this may not be N/A. If S/C reconstituted orbit data are used for actual data scientific processing of the data, the orbit data will be needed by HSC and ICC in the same time frame as e.g. aperture pointing history (within 8 hours TBC). What is your opinion?]

3.1.14.3: The MOC will make available the image of an instrument memory one hour after the last TM data for the dump has been received by MOC. This requirement is justified for memory dump request following instrument alert.

3.1.15.3 N/A. The delivery of instrument databases shall be subject to a detailed operational scenario in line with the scheduling cycle. See above.

3.1.16.3 N/A (to be covered by detailed operational scenario)

3.1.17.3: N/A (to be covered by detailed operational scenario)

3.1.19.3: The MOC shall notify the HSC of any instrument mal-function or operation problem within one hour of the detection of the problem.

4. MOC-> ICC control flow and performance (TBW):

3.2.1.2/3.2.1.3 [instruments mal-functions or operation problems]

The following was agreed:

3.2.1.2: The MOC shall notify the ICCs of any new information regarding the mal-functions or operation problems related to their instruments

3.2.1.3: The MOC shall notify an ICC of any instrument mal-function or operation problem within one hour of the detection of the problem.

5. FSC->MOC control flow (TBW):

3.4.3.2 [SSO database update]

3.4.4.2 [instrument database update]

3.4.5.2 [instrument procedures + command sequences], see point 15 below.

3.4.6.2 [instrument aperture misalignment]

It was agreed that the HSC would push these data to the MOC/DDS. No notification is needed by MOC.

In line with the above the other FSC->MOC control flow requirements:
3.4-50
3.4-100
will be modified as they assume that MOC shall pull data from the HSC.

6. FSC->MOC performance (TBW)

3.4.2.3 [Instrument OBS update]
3.4.3.3 [SSO database update]
3.4.4.3 [inst database]
3.4.5.3 [inst proc + comm sequences]
3.4.6.3 [inst aperture misalignment]

The following was agreed:

3.4.2.3: N/A
3.4.3.3: N/A
3.4.4.3: N/A
3.4.5.3: see point 16 below.
3.4.6.3: N/A

7. FSC->ICC control flow (TBW)

3.5.1.2 (consolidated TM data)
3.5.2.2 (MOC SW and data)
3.5.3.2 (FSC generated data)
3.5.4.2 (FSC system SW)

It was agreed that the HSC should notify the ICCs of the availability of these data. Requirement on pulling/pushing the data between the HSC and the ICCs are N/A as HSC and ICCs will store/retrieve data from the HCSS.

8. FSC->ICC performance (TBW)

3.5.2.3 (MOC SW and data)
3.5.3.3 (FSC generated data)
3.5.4.3 (FSC system SW)

It was agreed to set these sections N/A.

9. ICC -> MOC interfaces (TBW)

3.6: It was agreed to remove the paragraph wrt ICC@MOC to MOC interfaces. Information flow between ICC@MOC and MOC will be mostly informal and cannot be captured in an IRD.

10. ICC -> FSC control requirements (TBW)

3.7.2.2 [instrument health report]
3.7.3.2 [engineering and calibration observation]
3.7.4.2 [instrument mode validation status]
3.7.5.2 [observation analysis report]
3.7.6.2 [instrument specific SW & data]
3.7.7.2 [instrument observer manual]
3.7.8.2 [instrument database updates]
3.7.10.2 [instrument apertures pointing misalignment updates]
3.7.11.2 [instrument manual]

It was agreed that the ICC should notify the HSC of the availability of these data. Requirements on pulling/pushing the data between the HSC and the ICCs are N/A as HSC and ICCs will store/retrieve data from the HCSS.

11. ICCs-> FSC performance requirements (TBW)

3.7.1.3 [instrument on board SW updates]
3.7.2.3 [instrument health report]
3.7.3.3 [engineering and calibration observation]
3.7.6.3 [instrument specific SW & data]
3.7.8.3 [instrument database updates]
3.7.10.3 [instrument apertures pointing misalignment updates]

It was agreed to set these sections N/A

12. RTA<->FCSS in operation (partly TBW)

3.8 and 3.9
Agreed to be the same as in ILT or IST see 4.3 and 4.4.

13. OBS<->FCSS in operation (TBW)

3.10 & 3.11
It was agreed to be the same as in ILT or IST, see 4.5 & 4.6

14. FCSS->CCE (TBW)

4.8
Following meeting with PE and FW (H/P project) on 14/02, it is SV's understanding that the HCSS would interface to the CCS is a similar way as the EGSE-ILT does for commanding and therefore that the ILT interface requirements of 4.1.1 would be largely applicable to this section.
However, JD mentions that he did not get the same understanding following a meeting he had with project on the 05/03. SV will check with project (PE).

15. CCS->FCSS (partly TBW)

4.9

It was agreed that the following auxiliary data (and only these data) should be made available by the CCS to the HCSS:
- TC history
- Instrument memory image (dump).
- S/C and instrument databases

It was clarified that derived parameters and Out Of Limits information, when needed would be generated by RTA.

16. Miscellaneous

- 3.1.11 & 3.5.80: time correlation. It is the group's understanding (and in particular ESOC's) that having TAI on board means that the on board time will be actively maintained by MOC within a given tolerance (+- 20 ms TBC). With this understanding, time correlation information is not needed by the HSC and ICC. SV pointed out that project (Stephan Thuerey) seemed to have a different understanding, i.e. that the on-board time would not be regularly updated to make up for on board clock drift.

⇨ **AI#130301/4 : H/P Project (PE) to confirm or otherwise HGSSE understanding that the on board time will not be left drifting wrt the TAI. Due date: next meeting.**

It was mentioned again by JD that all MOC produced data e.g. TC history will be dated in UTC. Therefore time conversion (TAI => UTC) will have to be performed by the HSC.

- 3.1.12.2: Derived parameter data control flow is TBW.
- 3.1.13.2: OOL data control flow is TBW.

⇨ **AI#130301/5: NP to clarify that derived parameters and OOL information will be delivered to HSC in separate TM packets as part of the consolidated TM.**

- 3.1.6: observations schedule status information: It was clarified that this section should only relate to the acceptance/rejection of a schedule by MOC. Information related to schedule is in fact covered by

3.1.19: instrument mal-functions or operation problems. The section 3.1.6 should be renamed schedule status information.

- 3.4.5 & 3.7.9 : It was agreed to delete these sections with the understanding that the instrument procedures are part of the instrument user manual and the command sequences are defined as part of the instrument database. Instrument database is already covered in the IRD and the instrument user manual is to be added (ref. IRD vs. SIRD comment)

The following remaining TBCs/TBDs were discussed:
- 3.1-110: TBC can be removed
- 3.1.145 (S/C velocity prediction): The figure of 1m/s was proposed by PR as being in line with ICC expectation (wrt selection of instrument band). ESOC needs to check whether this is compatible with flight dynamics.
⇨ **AI#130301/6: DV to check that the flight dynamics accuracy for predicted S/C velocity. Due date: 30/03.**

- 3.1-240 and 3.1-250: Performance requirements should be deleted (relevant to scheduling scenario).
- 3.1-410
⇨ **AI#130301/7: DV to check that flight dynamics can make available APH within 8 hours from the reception by MOC of the AOCS TM data.**

- 3.1-520: TBC can be deleted.
- 3.3 : It was agreed that ICC@MOC could fetch information from the MOC DDS. ESOC stressed that this should be limited to ICC@MOC and that ICC@ICC will only have access to MOC data through the HSC.
⇨ **AI#130301/8: PR to send requirement regarding access to MOC DDS from ICC@MOC. Due date 30/03/01.**

- 3.4-60 and 3.4-70: Requirements will be deleted (relevant to operational scenario)
- 3.4-110: TBC can be deleted (see also RID-CCB-41)
- 3.5-40: TBC can be deleted (see also above comment on 3.1.7.3). Commanding timeline will be renamed mission timeline in line with 3.1.7.
- 3.5-160 : TBC can be deleted
- 3.7-90: TBC can be deleted
- 3.8-30: TBC can be deleted
- 4.2.-50
⇨ **AI#130301/9: PR to define TBD in consistency with the performance requirement 6.4 in the router ICD. Due date: 30/03/01.**

- 4.3.-35: TBC can be deleted
- 4.7-10: TBC remains pending S2K development schedule clarification.

- 4.9-40: TBC can be deleted. S/C TM shall be added. Test equipment shall be put TBC, it most likely that they will be no Test equipment connected during IST.

It was agreed that the FGSS-DD and the FGS IRD would be re-issued by end of May.

System Design

TC history extension

The draft TN on " Trading-off technical solutions for Relating TC history and HCSS commanding" formalising and summarising HGSSE discussion on this topic was sent on to all members on 14/02. ESOC has no comment on the TN. ICCs have still to read it but should have no problem with the recommendation.

⇨ **AI#130301/10: ICCs to formally agree on contents and recommendations of the TN " Trading-off technical solutions for Relating TC history and HCSS commanding". Dues date 30/03/01.**

The implementation of the additional field in S2K is still unclear. ESOC doubts it can done before S2K v3.0 (June 2002), which considering additional delay to have any new S2K version integrated in the EGSE-ILT, makes it too late wrt to current ILT schedule. Although there is a fall-back solution (see HGSSE#11), this entails significant additional work for the Test Control and SV stresses the importance of having it earlier, i.e. in S2K 2.2e (Oct 2001). NP says that it can only be decided as part of the S2K SRB (SPR Review Board) which takes place early April.

⇨ **AI#130301/11: NP to follow-up implementation of the additional field in TC History for S2K v2.2e and report. Due date 15/04/00.**

ObsId and BBId

The TN on ObsId and BBId re-issued on 08/03 was reviewed.

. Following discussion at the meeting, recommendations on ObsId and BBId implementation are:

- ObsId: 16 bits counter (site dependent). If in a given site, we exceed 65536 observation executions, the counter will be reset. This does not represent a risk of confusion for the TM ingestor, as the ingestion of two observation executions with the same id (if ever) will be months apart.

- BBId: 16 bits. 8 bits for the BB type (or mode) and 8 bits for counter (BB type dependent). BBId is to be unique within the context of an observation execution. Although not required to relate TM and BB execution (SV), the BB type is recommended to be included in the BBId for convenience. It was also pointed that it could be useful for RTA to relate events and BB types (PR).

[SV post meeting comment: It should be noted that this supports only sequential BB identification in a command sequence vs nested BB. Can we definitely drop the concept of nested BB?]

- All instrument HK, diagnostic and events PUS TM packets should be marked with ObsId and BBId.
- All Science PUS TM should be marked with ObsId. There is no identified need for that (SV), however this is felt to be reasonable and will be helpful if we need at some point to relate instrument PUS TM packets to observation execution.

- Science PUS TM marking shall be such that resulting data frames can be unambiguously related to Observation and BB execution.

- Non prime instrument will be set with default ObsId and BBId e.g. Hex 0000.

- The location of the ObsId in PUS TM packets should be the same for all instruments.

- Ideally for the GS, the S/C TM should also be marked with ObsId and BBId. However, it was recognised that this is not supported by project and that this entails on-board complexity (e.g. on board broadcast commanding). The S/C TM will have to be related to Obs and BB execution on time key only.
  [SV post meeting comment: this may cause a problem for relating S/C HK TM to Obs/BB in IST. In IST absolute timing information for observation execution will not be known to the HCSS before at least the instrument TM or the TC history have been ingested]

- ObsId should be set at the start and at the end of an observation using one specific instrument TC. Having a specific TC will make the commanding clearer (vs. having the ObsId as an additional parameter in a standard command). It is also justified by the concept of smooth transition in IST. In IST, there is a clear need to minimize/localise changes in a command sequence when re-executing this sequence (rerun of a test). When re-executing a command sequence, the ObsId needs to be updated to reflect the new execution, with the proposed scheme, the change will be limited to this well identified/specific TC. (Note that BBIds with the scheme defined above would remain the same).

- There was no consensus in the group for the commanding of BBId setting. Having a specific TC for BB id was ruled out as this would mean that each observation would need two TCs (one for ObsId setting and one for BBId setting) before the actual instrument set-up could actually be triggered. PACS favours having a TC setting both ObsId and BBId and HIFI having the BBId as an additional parameter to standard commands. This point is still open to discussion. It is in fact not clear whether commonality is needed at this level.

Other technical comments:

- It was clarified that the concept of ObsId and BBId is also valid for manual commanding from MOC, if needed. Command sequences delivered by the instruments to MOC can include ObsId and BBId

commanding. BBId values can be hard coded in the sequence. ObsId value could be passed over to MOC from HSC at the time of the uplink of the command sequence following a TBD procedure.
- RH questioned the understanding that all TC will be part of a defined BB especially for engineering observations. RH will try to confirm or otherwise in time for the next issue of the TN (see below).
- The OOL and derived parameter TM packet generated by MOC will not include ObsId and BBId. It should therefore be possible to relate them with observation/BB execution based on-board time key.

⇨ **AI#13030/12 : NP to send Derived parameter + OOL TM packet structure: Due date 30/03/01.**

Comments on the TN itself:
- the TN should include a section justifying the concept of ObsId/BBId (vs. using time key only).
- the TN should explain the concept of BB. The example given by PR at the meeting should be included.
- the TN should include a recommendation section
- the section 4 (on Observation/BB query) should be removed as this is not directly relevant to the technical issue. The TN should make that clear in the "scope" section.

⇨ **AI#130301/13: SS to update the ObsId BBId TN: Due date: 30/03/01.**

S/C TM:

SV recalled the context for this agenda item:
PACS is insisting on the importance of S/C TM for the data reduction (ACMS + others like telescope temperature to assess level of telescope background radiation). We have also heard from the ISO legacy conference and in particular from Andy Pollock (Vilspa 1st week of February) that the ISO AOCS data were not always appropriate for science data reduction (e.g. non correlated timing in AOCS TM, RPId information in user selectable data, i.e. not always present).

SV proposed that HSC and ICCs should have their say in the design of the Herschel ACMS TM and auxiliary data and possibly in the design of the ACMS itself and associated sub-units like the STR.

PR does not see that we can put requirement up front on the AOCS TM design, beyond the overall requirement that we should be able to reconstitute the S/C pointing at all time. RH will check with the PACS ICC if some more specific requirements need to be made explicit. SV will also further investigate.

It was agreed that, in any case, the science GS should be involved in the review of the AOCS TM design when available from the prime.

Data frames

PR pointed to some system engineering issues to be discussed on Data frames: interface between TM ingestor and instrument specific Data frame generator, commonality of data frame structure between instruments. It was however agreed that these issues would be better addressed as part of the next CSDT meeting.

ILT ICDs

On RH's request, SV recalled that UC were traced back with respect to IRDs and that the trace will be maintained upon UCs update.

SV stated that, in line with the concept of smooth transition, the relevant part of the Router ICD issued by Albrecht for the EGSE-ILT, ref. SRON-G/EGSE/ICD/2001-xxx should be made as much as possible applicable to the NRT TM I/F in IST and Operation.

NP agrees that the flow of TM between the MOC and ICC@MOC will follow the ICD, i.e. will be TCP-IP based and use the USER_DATA message (see ICD section 6 table 2). However, he does not see ADD_CLIENT and DEL_CLIENT messages being used. NP stated that the set-up of the communication (i.e. APIDs to be received) will be defined instead via a configuration file.

SV will check how this impacts the TM ingestor currently being designed for ILT.

I S T :

Status after meeting with project on 14/02

See point 14 of IRD discussion

Auxiliary data needed from CCS

See point 15 of IRD discussion.

Review list of ILT ICDs applicable to CCS in IST.

It was agreed that the following ILT ICDs were applicable to the CCS, in line with previous discussion on IRD:

-   ICD #1 : MIB format
-   ICD #4 : NRT TM ICD (subset of EGSE-ILT router ICD)
-   ICD #5 : TC history ICD
-   ICD #11: Test procedure I/F (as agreed at the 14/02 meeting with project but to be checked again, see above).

r

With respect to the OBS, if this is agreed that the instrument people will hand over to the CCS, PUS service 6 TC packets vs. memory image to implement their memory patches (see HGSSE#11), a new ICD will have to be defined. ICD#6 would then not apply to the CCS. This is still to be discussed (depends also on the prime using S2K for the CCS or not). In this concept, the instrument team in IST would use the S2K OBS to generate the TC implementing a memory patch.

ICCs will check whether this option is acceptable. NP will send an example (from ENVISAT) of what could be such an ICD.

⇨ **AI#130301/14 : NP to send ENVISAT ICD related to TC for memory management. Due date: 30/03/01.**

A O B & N e x t M e e t i n g

The FGSSE#13 meeting will be held on 2nd of May 2001 in KUL (B).

r

A t t e n d e e s:

John Dodsworth (ESA – ESOC)
Rik Huygen (KUL)
Nestor Peccia (ESA-ESOC)
Peter Roelfsema (SRON)
Sunil Sidher (RAL)
Stephane Veillat (ESA – HSC)
David Verrier (ESOC)

Cc:

O. Bauer (MPE)
J. Brumfit (Aurora – HSC)
T.G. Dimbylow (RAL)
Pierre Estaria (ESA – H/P project)
K. Galloway (Aurora – HSC)
A. Heras (ESA-HSC)
S. Lord (IPAC)
J.J. Mathieu (ESA – TOS-EMS)
Brian Melton (ESA – TOS-EMG)
G. Pilbratt (ESA – HSC)
J. Rector (IPAC)
J. Riedinger (ESA - HSC)
Serge Valera (ESA – TOS-EMG)
Frederick Wechlser (ESA – H/P project)
E. Wiezorrek (MPE)

r

MEETING

SV's slides: