

**MEETING**

meeting date <i>date de la réunion</i>	20-21 December 1999	ref./réf.	FIRST/FSC/MOM/0101	page/page	1 16
meeting place <i>lieu de la réunion</i>	ESOC	chairman <i>président</i>	SV		
minute's date <i>dates de minute</i>	17 January 2000	participants <i>participants</i>	see attached		
subject/objet	FGSSE#2 MoM	copy/copie			
description/description		action/action		due date/date limite	

20-12-99 14h00-18h00

The meeting started with the WINFOP presentation by Rhea followed by the SCOS-2000 demo.

WINFOP presentation by Rhea System

WINFOP can be of potential interest in the context of FIRST as an environment development for test procedures including instrument commanding and monitoring.

See Rhea's VG attached

SCOS 2000 demo by Sylvie Haag and Mauro Pecchioli (ESOC).

The demo was based on version 0.2 of SCOS-2000. The SCOS-2000 V1.0 will be made available in April 00. The manual stack, TC history and TC verification were demonstrated. No major issues were raised during the demo with respect to these functionalities.

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- SCOS 2000 archiving capability is on average 100 packets/s or 200kbps. It can go over 2mbps for large packets.
- TM packets can be accessed in RT from the SCOS-2000 Packet Delivery System (PDS) or in playback from HFA + PDS
- SCOS 2000 does not have anymore the concept of short-term archive (STA) and long term archive (LTA). STA used to be circular file based (see point on HFA above).
- HFA + database are the only entities that are needed to be imported to retrieve the SCOS-2000 context.
- SCOS 2000 operational archive includes the following SCOS-2000 generated packets: OOL, events and time correlation (TiC).

[SV's off-line question to JD: at one point during the demo, it was mentioned that the possibility to port the SCOS 2000 database on another DBMS than objectstore? Could we know if there is any plan in this direction and what would be the effort involved? Related to that what is the procedure/effort to export/import the SCOS-2000 database to another DBMS.

] JD's answer: The current approach to data base preparation at ESOC is to develop the S/C data base using a data base import and editing tool (currently based either on Oracle or MS access/Visual Basic) and then use this data base as the basis for WINFOPS and as the source of the ASCII files which can then be imported to SCOS 2000.

For MSG the approach is to use an Access data base generated by importing the EUMETSAT data base (in turn derived from the manufacturer's data base) from which the SCOS 2000 MIB is derived. Integral uses the same approach. Rosetta uses the manufacturers Oracle data base (which was developed in close cooperation with ESOC) as the MIB.

I would propose for FIRST to initially use the tools delivered for Integral and MSG as a basis for the MIB, since the data structures required are already defined. Harmonisation with the S/c manufacturer would come art a later stage. There is some investment to be made, of course, to customise the systems for F/P. It should not be more than a couple of man months.

We do not yet have the reverse process (export from SCOS 2000), but I think it is planned. I wil try to find out.]

Objective & Agenda discussion

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- p 3 TM: It was clarified that in routine/nominal operation ICCs will not ask for real time commanding of their instrument. In case of instruments emergency, RT commanding will be done by MOC with telephone/voice loop contact with ICC if necessary.
- p 4 TM: pseudo TM format can read SCOS-2000 packets
- p 7 Data flow originating from FSC: Even small commands shall correspond to one TC packet. Having several small commands embedded in one TC goes against the PUS principle and design to have only functionally related commands in one TC packet.
- p 8 ILT: Only HIFI (not all ICCs) stated that FINDAS would not be needed in the first days of ILT.

Downlink issues:

TM data flows

FIRST TM data flows identification:

The discussion based on SV VG#5 led to following TM data flows identification and clarification:

TM data flows	VC
Live S/C + instrument HK TM	VC-0
Live Science TM	VC-1
Dumped S/C +instrument HK TM	VC-2
Dumped science TM	VC-3

Live TM are TM generated during direct communication with ground.
Dumped TM are TM stored on the S/C SSR.

The Virtual Channel (VC) is purely a space/ground communication concept and is independent from the handling of the TM flow at the Ground Station (GS) level. In any case, all TM flows are stored at GS level (JD).

VC-0 & VC-1 will be retrieved in RT from the GS

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Seen from FSC and ICC, one should therefore rather talk about live TM (VC-0 & VC-1) and consolidated TM.

[PR's post-meeting comment: I don't think the right way is to say that from a point of view of ICC there are live TM and consolidated TM only; there is live analysis and off-line analysis only, and off-line is not necessarily only consolidated.]

FIRST TM dataflows requirements:

In routine phase:

The following table and comments summarise the discussion on TM dataflow requirements during routing phase. The starting point of the discussion is SV's VG# 6. This table was first generated at the FIRST scenario meeting on 16/12/99, see FIRST/FSC/MOM/098

Routine phase: Nominal	Live HK	Live Sci.	Consolidated HK	Consolidated Sci.
ICC@MOC (ICC WS at MOC)	Not needed /Needed: TM packet within 20'' after MOC reception of the packet	Not needed /Needed: TM packet within 20'' after MOC reception of the packet	Not needed (HIFI) ?? (PACS/SPIRE)	Not needed (HIFI) ?? (PACS/SPIRE)
FSC	Not needed	Not needed	Needed	Needed
ICC	Not needed / possibility to remote log to ICC@MOC	Not needed / possibility to remote log to ICC@MOC)	Needed within 20' after MOC has received the last TM bit of an OD	Needed within 32 h after MOC has received the last TM bit of an OD

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The following table and comments summarise the discussion on TM dataflow requirements during PV phase.

PV phase: Nominal	Live HK	Live Sci.	Consolidated HK	Consolidated Sci.
ICC@MOC	Not needed /Needed: TM packet within 20'' after MOC reception of the packet	Not needed /Needed: TM packet within 20'' after MOC reception of the packet	Not needed (HIFI) ?? (PACS/SPIRE)	Not needed (HIFI) ?? (PACS/SPIRE)
FSC	Not needed	Not needed	Not needed	Not needed
ICC	Not needed / possibility to remote log to ICC@MOC	Not needed / possibility to remote log to ICC@MOC)	Needed within 20' after MOC has received the last TM bit of an OD	Needed within << 32 h after MOC has received the last TM bit of an OD

The requirements for PV phase are similar to those of routine phase except for the science consolidated TM time delay which shall be lower than 48 hours (TBD from scenario). This means that consolidation at MOC level will have to be performed on a higher frequency than once per OD.

In commissioning phase:

The following table and comments summarise the discussion on TM dataflow requirements during commissioning phase. The starting point of the discussion is SV's VG# 7.

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Commissioning phase	Live HK	Live Sci.	Consolidated HK	Consolidated Sci.
ICC@MOC	Needed: TM packet within 20'' after MOC reception of the packet	Needed: TM packet within 20'' after MOC reception of the packet	Not needed (HIFI) ?? (PACS/SPIRE)	Not needed (HIFI) ?? (PACS/SPIRE)
FSC	Not needed	Not needed	Not needed	Not needed
ICC	?? (TBD from operational scenario)	?? (TBD from operational scenario)	Needed within 20' after MOC has received the last TM bit of an OD	Needed within << 32 h after MOC has received the last TM bit of an OD

Regarding the need for live TM at ICC during commissioning, the following was discussed:

Consolidated TM will encompass all instruments and S/C TM and therefore will include TM that have been previously received live. However, ICCs cannot exclude the need to have access at ICC to the live TM dataflow (although not in RT as in ICC@MOC, see below).

According to HIFI (PR), ICC@ MOC could produce on board calibration file from live TM and ICC would need to have access to the exact TM flow used to produce these calibration files. PR reckons that the generation of calibration file from live TM would be limited to these on-board files, i.e. uplink and downlink calibration data would only be generated from consolidated TM at ICC.

The access to this TM dataflow does not need to be in RT (i.e. within TBD hours not within 20'') as it would only be needed at ICC for archive purpose.

TM dataflow Design

Following the requirements discussion, TM dataflow design was discussed based on SV's VG# 10:

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not in line with above written requirements. The one-minute latency would be acceptable if ICCs had access to the SPACON console during commissioning.

- FSC will only retrieve consolidated TM from MOC (SV).
- ICC@MOC will include RTA and QLA (not IA) functionality. QLA is to be designed by ICC as a subset of IA (PR)

The discussion focused on the TM flow for RTA and QLA. Two design options have been identified during the meeting:

1. In ICC@MOC, RTA & QLA interface directly with the ICC@MOC SCOS-2000 which is itself fed in RT by MOC (see point above). This is a realistic design option: SCOS-2000 HFA can be accessed in RT and can store any type of TM (science included) (see SCOS-2000 demo discussion).

In ICC, RTA & QLA interface directly with the ICC SCOS-2000 e which itself interfaces with FINDAS.

In this scenario:

- both RTA and QLA would be SCOS-2000 based.
- FINDAS is not needed in ICC@MOC
- No RT FINDAS is needed
- QLA being a subset of IA and IA interfacing directly with FINDAS, QLA/IA front-end modules must be developed to interface both with SCOS-2000 and FINDAS.

2. In ICC@MOC, RTA interfaces directly with the ICC@MOC SCOS-2000 which is itself fed in RT from MOC

In ICC@MOC, QLA interfaces directly with FINDAS, which is itself, fed in RT from MOC.

In ICC, RTA interfaces directly with the ICC SCOS-2000 that is itself fed from FINDAS.

In ICC, QLA interfaces directly with FINDAS.

In this scenario:

- Only RTA is SCOS-2000 based
- FINDAS is needed in ICC@MOC
- RT FINDAS is needed to cater for QLA RT operation. For QLA 1 minute delay is acceptable (PR). The RT part is only that it has to keep up; 100 kb/sec in means also 100 kb/sec out,... but not necessarily at the same time and not even synchronous (PR)

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scenario 1: Please note that this scenario:

- *IS the Planck scenario (nice FIRST-Planck commonality if adopted by FIRST!)*
- *Does not require definition/implementation of Consolidated Archive (no schedule pressure on ESOC)*
- *Does NOT require FINDAS-ILT since the ICC@MOC configuration IS the ILT-configuration (with the S/C Simulator replacing the MOC)*

scenario 2: ILT-FINDAS is required]

[RH post meeting comments on scenario 2: in this second scenario the SCOS-2000 archive at the MOC could be fed by the FINDAS node at the MOC since FINDAS is fed in Real-time by the MOC. This would reduce the interface from MOC to ICC@MOC to only one interface, i.e. the MOC(DDS) to FINDAS interface. A similar interface as used by FSC to connect to the MOC(DDS). Also the ICCs would benefit from this since then the set-up at ICC@MOC is identical to the set-up at the ICC@HOME]

[SV's post-meeting addendum: I propose that ICCs and FSC have an action to further assess these design options and investigate other options if any for the next meeting.]

=> AI # 211299-1 ICC & FSC to further assess the above design option and investigate other options if any. Due date: next meeting.

S/C TM format:

ICCs stated that they preferred to have S/C TM data processed (e.g. conversion to engineering units) by MOC (all relevant S/C TM, not only pointing data) before acquisition by ICC versus acquiring directly S/C source TM packets. This processing is done by MOC in any case. Design wise this should lead to a specific file interface.

The maximum delay requirement of 20' to acquire consolidated HK TM is not applicable to S/C TM. For S/C TM, the requirement can be relaxed. The correlation between instrument HK TM with S/C TM when needed is to be done by ICC.

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Relation between TM and observation context:

It shall be possible to query TM at the level of measurements (e.g. dark current measurement) (PR). For this purpose, it is expected that TM will be tagged with the measurement context in addition to the observation context. It is yet unclear whether this means having measurement contexts uplinked through dummy TC as for observation contexts. One alternative (TBC) would be to have measurement context autonomously identified by the instrument on-board.

It was agreed that the uplink of the observation context could be solely managed at instrument level. The OBDH does not need to be involved, even if we operate instrument in parallel with the same observation context, i.e. no need to broadcast observation context on board. In all cases, the observation context and the measurement context (if needed) would be uplinked through instrument commands. The observation and measurement context would be transparent to the OBDH and to the MOC and only handled at instrument and FSC/ICC levels.

FRD & ICC queries of FIRST data

The concept of FRD is unclear to ICCs. PACS (RH) proposed to get rid of the acronym FRD since it only creates confusion. The concept should evidently stay since it will be a view on the objects in the database that is relevant for the FSC users, i.e. astronomers.

For FSC (SV), following discussion of FGSSE#1, FRD should be seen as a particular query on FSC data.

=> AI # 211299-2 ICC to clarify FRD concept and identify expected types of queries on FIRST/FSC data. Due date: next meeting.

Uplink issues

Not addressed for lack of time.

RH's report on action AI-15119-2 (PACS commanding scheme) was postponed to next meeting.

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commands which together do form an observation. I.e. the output of a CUS 'translation' is a schedulable block in operations.

VG#5: For subsystem testing, there is no TC/TM concept, data storage needed but not for TM. Instrument DM tests will be supported by RTA-like functions up to end of first quarter 2001.

VG# 6: In phase 1, the possibility to link of TM with test/observation and TC for retrieval/query purpose is seen as a hard requirement by HIFI.

Consequently, FINDAS would be needed starting June 2001 to support this requirement. If FINDAS is not available at this stage, other facilities will have to be implemented to meet this requirement.

SPIRE presentation (see SS's VG attached)

Up to CQM AIV SPIRE do not need to implement the concept of observations for test purpose. Therefore, FINDAS would only be really needed from CQM AIV starting Jan 2002. But before that in April 2001, SPIRE expects to take delivery of the DPU/DRCU simulators. That means we need FINDAS like functionality between Feb. 2001 and Jan. 2002. Obviously the sooner the better. If, in this period, SCOS-2000 can meet the requirements then fine!

PACS (RH):

The first PACS ILT will be in June 2001 and will be an AVM test. The AVM consists of all the warm electronics (DPU, SPU and DEC/MEC) plus a FPU simulator. The purpose of the test is to validate the correct functioning of the warm electronics part of the instrument. The FPU simulator will output a signal that is suitable for validating the SPU reduction/compression software. Since we are talking to the DPU, we are essentially talking to the instrument and not to individual parts. The output will therefore contain valid HK data and science data which we want to be stored into FINDAS. We therefore need (some) FINDAS functionality during the AVM tests.

RH also stressed that we should take a sufficient test period into account for setting up and integrate the test system. This means that we would need FINDAS functionality at least three months before testing can begin.

Work plan

Not formally discussed for lack of time. However, RH contributed the following comment:

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- **Refocus the objectives:** *The group is currently already defining interfaces between ground segment components while at this time the scenario document—from which the interfaces should be derived—is being written and discussed. The danger exists that decisions are taken that will be premature and that interfaces will be cut that later must be re-established.*
- **No decisions:** *If I read through the minutes, I find several places where it says that the meeting has decided or has established something. I feel this is again premature. It is not that we discussed a topic that there is automatically a 'formal' decision from this group. Even if we reached a consensus. This is especially important when it says that the group is restricting something. We have to keep in mind that we might come to a different conclusion after implementing the scenario document. So, why do we exist then...*

Technical discussions: *There is no problem at this time to have technical discussions about all the topics on the agenda in order that all members of the group understand the essence. This will even save us time when we have to come to real decision-making.*

Nevertheless, I feel that we better refocus on contributing to the scenario document. Two groups (FGSSE and Scenario Meeting) that contain almost the same members are at this time discussing parallel topics and may come to contradictory conclusions.]

[SV's post meeting addendum: I propose we have a teleconference end week 3/early week 4 (after scenario meeting) to address this work plan:

- *We need to take stock of the result of the scenario meeting to see where we go from there and how that influences our work*
- *Next meeting is only a one day meeting and we may not have time to address this issue*

]

AOB & Next Meeting

Week 4 being already booked for some of us, the next meeting will be in week 5: 2nd of February in ESTEC.

[Post-meeting comment: Next Meeting date changed to the 4th of February on SS's request]

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Attendees:

John Dodsworth (ESA – ESOC)
Pierre Estaria (ESA - FIRST/PLANCK project)
Rik Huygen (KUL)
Peter Roelfsema (SRON)
Sunil Sidher (RAL)
Stephane Veillat (ESA – FSC)

Cc:

O. Bauer (MPE)
J. Brumfit (Aurora – FSC)
P. Claes (ESA – FSC)
T.G. Dimbylow (RAL)
K. Galloway (Aurora – FSC)
A. Heras (ESA-FSC)
S. Lord (IPAC)
J.J. Mathieu (ESA)
Nestor Peccia (ESA-ESOC)
G. Pilbratt (ESA – FSC)
J. Riedinger (ESA - FSC)