Commonality Working Group #3 (RTA) - Minutes of Meeting no. 1

held at ESTEC, Noordwijk, 3 February 1999

1. Welcome and presentation of participants

Participants:

> Otto Bauer (MPE/PACS)
>
> Christopher Butler (ASI/LFI)
>
> Francois Couchot (LAL/HFI)
>
> Anna Di Giorgio (IFSI)
>
> Trevor Dimbylow (RAL/SPIRE)
>
> Pierre Estaria (ESA-FIRST/PLANCK Project)
>
> Rene Gastaud (CEA/SPIRE)
>
> Richard Gispert (IAS/HFI)
>
> Ana Heras (ESA/FSC)
>
> Rik Huygen (KUL/PACS)
>
> Fabio Pasian (OAT/LFI)
>
> Bart Vandenbussche (MPE/PACS)
>
> Erich Wiezorrek (MPE/PACS)

The chairwoman (AMH) welcomes everyone. All the participants introduce themselves. AMH informs that Peter Roelfsema from HIFI cannot attend the meeting since he must participate in the HIFI general review in JPL. The agenda is agreed (Appendix 1), with the additional point proposed by CB of "Questions to ask to other CWGs".

2. CWG#3 role and objectives

AMH submits the proposal on the role and objectives of the CWG (see Appendix 2) as was presented to the Steering Committee. The proposal is accepted but for the list of tasks, that will be discussed at the end of the meeting, and the date for the first version of RTA/QLA, which depends on instrument development planning.

With respect to the member list, ADG explains that she is not representing HIFI exclusively, since her group at IFSI are involved in all the instruments. She prefers to be considered as a member of cross-instrument support.

Action 1:   PE to update the table of Commonality Working group members which appears in the minutes of the Steering Committee 1st meeting, and include the cross-instrument support members.

PE points out that the proposal of the role and objectives of the CWG#3 is based on the ISO experience. Following a question from CB, OHB shows a viewgraph with a scheme of the RTA/QLA that was used for ISO, updated to be used by PACS, and explains the functionality of each module. There are several options on how to proceed for the development of RTA/QLA:

- To adapt the ISO RTA/QLA to FIRST/PLACK and use it in VMS
- To adapt the ISO RTA/QLA to FIRST/PLACK and transport it to UNIX
- To rewrite RTA/QLA using O-O techniques
- To use SCOS-2000 for RTA (for PACS QLA will run independently of RTA and will be part of IA).

OHB mentions that the HK and science telemetry packets are independent. The instrument information is in HK and the detector information in science packets. PE says that MOC will never open science packets. In case they are needed, some science packets may be duplicated in the HK packets. BV points out that one should think in terms of data models. MOC will put parameters in a database, and we will have to replicate the objects from this database.

3. RTA/QLA concept

3.1 HFI

FC explains the HFI RTA/QLA concept (Appendix 3) and the implementation plan during the various phases of the project. RTA should work from HK telemetry and QLA from science, HK and S/C telemetry. There is a problem with the fact that phase B starts so late. Presumably some technical decisions on the TM packets structure will be taken by the S/C contractor. This implies that the instruments will face the problem of the availability in time of the spacecraft simulator.

There is some confusion about the times involved in the transmission of the data. The real time stream can be seen in real time during the 2-4 hour time window. The "dumped data" are dumped in Perth and transmitted later. RTA will run real time and with dumped data, and QLA will be operated approximately 2 hours later in Geneva.

Action 2: PE and CWG#4 to explain the flow of data between ground stations and the delays between different antennas.

In principle HFI will process all data through RTA/QLA. The S/W will be needed for ground calibration starting 2001. For coherence with the DPC, it is preferably that RTA/QLA is developed in an O-O environment.

There is a discussion on which kind of automatic procedures should be triggered on-board when an out of limits condition appears, or which ones should be analyzed by RTA.

It is made clear that the instrument teams do not supply RTA S/W to MOC. MOC will never use the instrument station with RTA. That is, RTA will not be used by the SPACONS.

PE emphasizes that it would be very useful to know when the deliveries of the S/C simulator, the CCE and other elements are needed by the instrument teams.

Action 3: On all instrument teams to provide plans for ILTs, indicating required deliveries.

It is not clear to HFI whether FINDAS, a FINDAS "clone" or no FINDAS is the best option for HFI ILTs.

3.2 LFI

CB presents the LFI RTA/QLA concept (Appendix 4), and a detailed plan for the all the RTA/QLA versions needed. The first one is required by March 2002 at the latest, to support AVM development and ILTs. The same version of RTA/QLA will be used to support Planck PFM development and tests and for Commissioning and PV phases. A new version is foreseen for DPC support during routine operations, which will probably need all S/C data. This seems to be a safe approach, but it is not decided yet.

RTA should operate on real time telemetry, and the required functionalities are: out of limit checking (HK and limited science parameters), data display, graphical representation, logging and archiving of events.

QLA should be a system for off-line analysis of science data, which provides quality control and monitoring of science data.

In principle it is not clear how RTA should perform Command Verification for LFI, although it should be very simple. In the case of Planck, the same configuration is frequently repeated. The commanding for FIRST is different, since the frequency of uplinking different commands is much higher and command verification should properly check their execution. MOC performs certain checks after a command is uplinked. We should get information on how and to which level this is done. It is decided that this will be one of the questions for the SCOS-2000 presentation at ESOC.

The facilities required for test preparations (uplink preparation for PLANCK) are seen as separate from RTA/ QLA and will possibly run on another machine.

LFI would prefer not to have to interface with FINDAS for the ILTs.

3.3 PACS

OHB explains how to integrate the RTA/QLA system in the different operational environments (ILT, ISTs and operational phase), using always FINDAS as interface between the ICC Instrument Analysis environment and CCE and MOC (Appendix 5). PACS plan to install in the Instrument Station the software for ICC uplink preparation (test procedures, templates) with commanding capabilities.

It is pointed out that Command Verification will probably be different in ILTs, which are exclusively real time, and in operations (in which dumped data are used). This raises the question if there should be different HK packets for real time and for routine operations.

PACS see QLA as a separate task (based on IDL), which has access to all parameter space, running in IA with real time functionality. Since PACS must perform much data compression and reduction in the SPU, QLA will be used to check how the on board software has handled it.

The first version of RTA is needed by end of 2000.

Uplink commanding preparation could also be common for all the instruments. The steering committee should discuss this point.

3.4 SPIRE

TD presents the SPIRE approach for RTA/QLA (Appendix 6). In UK the staff levels and profiles for ICC development are well established. Training has also started. Some adjustments on the distribution of tasks in the consortium have still to be made. The RTA functionality covers OOL checking against soft and hard limits, multiple configurable displays, memory dump checking, Command execution Verification (TBC). The first version of RTA/QLA for CQM check out, interfacing with EGSE (preferably) or FINDAS, will be required by end 2001 or early 2002. The PFM version check-out using FINDAS should be ready by mid 2003. QLA could access directly the data from FINDAS. For mission operations, there should be no changes in the interfaces.

SPIRE are not planning to include the ICC uplink preparation software in the Instrument Station.

The adoption of Unix as operating system is questioned. Other possibilities and other machines should be studied. It is decided not to make any assumptions until the SRD phase. It is felt however that it is desirable to agree on a unique OS for all.

3.5 FSC

The First Science Centre is responsible for the quality control of the FIRST data, since it must do replanning of failed observations and must inform the observer about the success/failure of his/her observation (see Appendix 7). Therefore it is assumed that all data will be run systematically through RTA/QLA, so that a report

with real time errors and bad detector conditions (saturation, too high glitch rate) will be provided. There is the possibility that the quality check on detector data is done by the quality control pipeline.

OHB mentions that if quality checks can be performed on board, there is no need to run all the data through RTA/QLA. This is a point to be addressed by CWG#4. He points out that the PACS ICC will only make a "technical", not a scientific evaluation of the quality of the observations. Another issue is who will be responsible to check quality on pointing. This is to be discussed in FSC.

4. Preliminary identification of common parts

- The ICC uplink preparation software will run in parallel to RTA (although not necessarily in the same machine).

- There is the conservative approach (LFI, HFI, SPIRE) of not requiring FINDAS for the first version of RTA. PACS needs RTA one year earlier than the other instruments for detector testing, and favours that FINDAS will already be the interface. **The CWG#3 recommends that an implementation plan for FINDAS development is established and the corresponding priorities set. The CWG#3 requires that the real time data provision and local storage part of FINDAS are given the highest priority.**

Action 4: AMH to pass this recommendation and request to the CWG#6 chairman and to follow up their implementation.

- Command Verification is a common area for the FIRST instruments (TBV for the Planck instruments). How to perform CV is a topic to be addressed in CWG#4.

- The interface between RTA and QLA is not a common part of the system, because the data will not be run first through RTA and then passed to QLA. In the new approach, QLA will interface directly with the TM database.

- For FIRST, both RTA and QLA will provide the files required by FSC for quality control of the observations.

- The H/W configuration for RTA (Instrument Station) should be common. After the RTA system to be used is agreed, the H/W configuration could be decided, although it is TBD if this commonality can already be introduced for the ILTs.

- Since QLA is not common, it has been decided to rename the CWG#3 as "RTA Commonality Working Group".

- The following table summarizes the plans for RTA implementation for each instrument (when available):

	HFI	LFI	HIFI	PACS	SPIRE
RTA (CQM)	2001	Mar 2002	-	end 2000	end 2001
RTA (PFM)	-	mid 2003	-	-	mid 2003
RTA operations	-	L-6 months for PVP L-12 for routine op.	-	-	-

5. Proposal to use existing S/W

It is agreed that to use SCOS 2000 as a framework for RTA is the first option to be studied. PE informs that there will be a SCOS internal delivery to ESOC next month. After consultation with ESOC, the best time for a demonstration and discussion is April (TBC).

Action 5: PE to ask ESOC for SCOS documentation which could be made available before the demo.

Action 6: All members to provide PE with questions about the SCOS system.

Action 7: PACS to distribute the set of PACS RTA requirements (to be used for the common RTA and for SCOS testing).

Action 8: Instrument team representatives to comment on PACS RTA requirements.

If the SCOS 2000 option is finally not selected, the other options to consider at present are:

- RTA system developed at MPE and based on the ISO package
- Package used in the operations of Integral
- C++ package currently available in Groningen for investigation

Action 9: Each instrument representative to supply their manpower estimates for RTA related activities.

Action 10: FP to talk to the Integral RTA group in the ISDC (Geneva), to organize a presentation on their system.

6. Work planning

1. Demo at ESOC and meeting with SCOS 2000 experts ⇒ April
2. Next CWG#3 meeting, to discuss SCOS 2000 assessment status and the use of other existing RTA packages ⇒ 19 May
3. Demonstration in Garching of the usage of SCOS 2000 as RTA framework ⇒ end of July
4. Preparation of the RTA Delta-URD ⇒ starting in September
5. Report on SCOS 2000 suitability as framework for RTA ⇒ end September

7. Date and place of next meeting

Next meeting to take place at ESTEC on May 19th.

8. List of tasks

The list of tasks presented by AMH is discussed, and agreed as:

- Define common and instrument specific elements in RTA/QLA
- Assess the usage of existing software and write the corresponding Delta user requirements
- Define Instrument station H/W
- Define interfaces with external elements (e.g. FINDAS, uplink)
- Coordinate and supervise implementation and agree delivery dates
- Define and supervise Acceptance Tests and generate Test reports

Action 11: OHB to make a proposal on how the various instrument groups could participate in the generation of the RTA ATP.

9. AOB

AMH distributes some general information about the SCOS-II system.

List of Actions:

CWG3-A1: To update the table of Commonality Working group members which appears in the minutes of the Steering Committee 1st meeting, and include the cross-instrument support members. **Actionee:** PE **Deadline:** 16/03/1999.

CWG3-A2: To explain the flow of data between ground stations and the delays between different antennas. **Actionee:** PE and CWG#4 **Deadline:** 19/02/99

CWG3-A3: To provide plans for ILTs, indicating required deliveries. **Actionee:** Instrument teams **Deadline:** 19/05/99

CWG3-A4: To pass recommendation and request on FINDAS real time data provision and local storage to CWG#6 chairman and to follow it up. **Actionee:** AMH **Deadline:** 30/09/99

CWG3-A5: To ask ESOC for SCOS documentation to make it available before the demo. **Actionee:** PE **Deadline:** 12/02/99

CWG3-A6: To provide PE with questions about the SCOS system. **Actionee:** CWG#3 members **Deadline:** 31/03/99

CWG3-A7: To distribute the set of PACS RTA requirements. **Actionee:** PACS representative **Deadline:** 16/04/99

CWG3-A8: Comment on PACS RTA requirements used for SCOS testing. **Actionee:** Instrument team representatives **Deadline:** 30/04/99

CWG3-A9: To supply estimates of manpower available for RTA related activities. **Actionee:** Instrument team representatives. **Deadline:** 05/03/99

CWG3-A10: To talk to the Integral RTA group in the ISDC (Geneva), to organize presentation on their system. **Actionee:** FP **Deadline:** 19/05/99

CWG3-A11: To make a proposal on how the various instrument groups could participate in the generation of the RTA ATP. **Actionee:** OHB **Deadline:** 5/03/99

Questions to other groups

To CWG#4:
- Should there be different packets for real time tests and for routine operations?
- How is the data flow between ground stations and the delays between different antennas? (CWG3-A2)
- Which checks on real-time conditions and data quality (out of limits, detector saturation...) could be done on-board?
- How to perform Command Verification?

To steering committee:
- Shouldn't uplink commanding preparation be also an aspect of commonality?

To SCOS-2000 specialists:

- In which way SCOS-2000 carries out Command Verification?

To FSC:

- Who will be responsible for quality control on pointing?