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Date 23/3/07

Référence H-P-ASP-LT-8929

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OBJET/SUBJECT : Organisation of Herschel Reference Mission Scenario

ref : (1): ASED schedule report : HP-2-ASED-RP-0142_24
(2): Instrument AVM & FM test spec H-P-2-ASP-TS-1083

Sirs,

The "AVM" reference mission scenario is identified as such in your last schedule report (ref (1))
452 Debug REFERENCE Mission Scenario (part 1-SPIRE) 6 days (26.04.07 to 04.05.07)
457 Debug REFERENCE Mission Scenario (part 2-PACS) 6 days (07.05.07 to 14.05.07)
462 Debug REFERENCE Mission Scenario (part 3-HIFI) 6 days (14.05.07 to 22.05.07)

At the time it is executed, this test will be carried out with SPIRE FM DPU + DRCU simulator, and PACS AVM.

It is pointed out that HIFI AVM is not involved in RMS since it has not the capability to run the RMS (HIFI have stated that no science packet can be generated by ICU alone). Therefore no MTL has been prepared for HIFI AVM by ESOC/ESAC, and it has been replaced by SPIRE Spectrometer (that cannot be tested on FM due non compatibility of the cryostat for a 48h test in horizontal position). This has been agreed several months ago with ESA/ESOC/ASED, and is included in the draft issue 2 of ref (2) (extract attached below in annex 1).

The proposed sequence, thus, does not match the RMS test as specified in ref (2) Iss2.
We consequently understand the 3 debug phases in the current schedule more like reserved time periods for the RMS debugging.

There also currently exists a constraint due to a CDMU ASW non conformance (NC 2797). The current version of the CDMS software (2.6.2) cannot execute more than about 1300 TCs, which represents about 3h of RMS test (SPIRE MTL is about 8000TC's). MTL can be loaded properly, but does not execute completely. This should be corrected in a later issue of CDMS software, not available before end April. Note that this is not considered as a limiting factor for the debugging phase and would affect only the formal runs. Indeed, the essential part of the

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debugging will consist in bringing the satellite in the expected configuration at start of the RMS. Then for obvious time reasons, it is not realistic, nor of interest during debugging, to let the MTL run for tenth of hours.

Finally we would like to propose a different arrangement of this RMS sequence:

1- start with session called RMS debug, where the 3 MTL's (SPIRE photo, PACS, SPIRE Spectro) are loaded, and run until the execution is stopped by a TC to bring the spacecraft into Earth Acquisition Mode (which stops the MTL) after approx 3h. Each of the 3 MTL's can be used during debug to verify the operation with each instrument/mode.
2- interleave a period to eventually correct the bugs identified during this debug session. This would leave time to upgrade the CDMS software
3- . execute a 48h run for the RMS test using the AVM instruments (mainly to check that a long sequence can be executed. This phase needs to be performed in 3 shifts.

A short sequence dry run phase before the FM IST/RMS formal run in September must also be planned to guarantee the test success with the FM instruments, including HIFI.

With best regards,

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Annex 1: extract of section 4.6.1 of Instrument AVM & FM test spec H-P-2-ASP-TS-1083_2draft

The objective of the **Reference Mission Scenario** is to test the satellite during its nominal long term operation, especially comprising the scientific instruments operations.

It is organised around the Reference Mission Scenario (AD14) which defines the activities to be carried out during a typical operational day.
It will be a 48h continuous operation, controlled by mission timeline (MTL=time tagged sequences). Each instrument will be allocated 14h simulated observation, separated by Slots of 3h DTCP simulation (Daily Tele-Communication Phase, including coolers recycling)). Inside this phase, instruments are free to prepare sequence using various observation modes.
The satellite will be horizontal, to allow cooler recycling and SPIRE spectrometer mode without moving during the test.
PACS will be used shortly at the beginning, in burst mode to fill the system memory for DTCP1.
Then the sequence is the following.

For FM:

- PACS Prime / Burst Mode (30mn)
- DTCP1: Switch PACS to HIFI (3h)
- HIFI Prime (include peak-up) (14h)
- DTCP2 : Switch HIFI to PACS + PACS cooler recycle (3h)
- PACS Prime (14h)
- DTCP3 : Switch PACS to SPIRE + SPIRE cooler recycle (3h)
- SPIRE Prime Photometre (include peak-up) (14h)
- DTCP4 : Switch SPIRE to PACS + PACS cooler recycle (optional) (3h)
- PACS Prime (30mn)

For AVM:

- PACS Prime / Burst Mode (30mn)
- DTCP1: Switch PACS to SPIRE & include SPIRE cooler recycling (3h)
- SPIRE Prime Spectrometer (14h)
- DTCP2 : Switch SPIRE to PACS + PACS cooler recycle (3h)
- PACS Prime (14h)
- DTCP3 : Switch PACS to SPIRE + SPIRE cooler recycle (3h)
- SPIRE Prime Photometre (include peak-up) (14h)
- DTCP4 : Switch SPIRE to PACS + PACS cooler recycle (optional) (3h)
- PACS Prime (30mn)

The detailed sequence of RMS is given in table of next section 4.6.6, and section 5.8.9.3 of AD 21.