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	Date	Référence H-P-ASP-LT-5513

SERVICE/*DEPARTMENT* : FAX n° :

DE / *FROM* :B.Collaudin

A / *TO* (Dest, Soc/*Comp, Fax n°*) :
ESA: A. Elfing, G.Crone, A.Heske
CC: ASP: Juillet, Rideau, Y.Roche, P.Couzin, S.Raphel, J.P.Chambelland, G.Doubrovik
ASED: S.Idler, J.Kroeker
Alenia: M.Sias, M.Cesa
Instruments: SPIRE, PACS, HIFI, HFI, LFI, SCS

IID-A Updates from System CDR RIDs

Sir,

This mail is intended to reply to actions or recommendation system CDR RIDs related to IID-A. It present a compilation of all updates directly asking for modification if the IID-A (with and without actions)
It should close the actions related to the RIDs given in the 5 first lines of the table below.

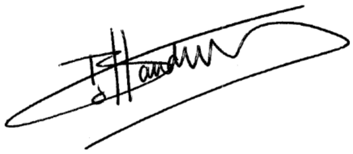
The changes proposed in this document have already been included in the DOORS database (except the one on the ICD's for warm units MLI standoff as not available).

RID	Title	Action	Update IID-A
RID-SYS-086	HIFI FPU thermal interface	AI 1	Yes (done in Doors)
RID-SYS-087	FPU mounting hardware	(covered by AI1 from SYS086)	Yes (done in Doors)
RID SYS-103	LFI Comments to IID A	AI 1 + (covered by AI1 from SYS086)	Open for MLI standoffs, no for the rest
RID MTP-036	WU random vib qual levels on Planck	AI 2	No
RID MTP-072	IIDA - Discrepancies	Point 3 No action Point 5 - AI-1	Yes (done in Doors) Yes (done in Doors)
RID MTP-	Herschel / Planck Mass	No action (agreed at	Yes (done in Doors)

RID	Title	Action	Update IID-A
022	Budget	collocation)	
RID AVI-010	Circular definition of Herschel +ZHSC axis	No action (agreed at collocation)	Yes (done in Doors)
RID SYS-019	Deleted blank test	No action (agreed at collocation)	Yes (done in Doors)
RID SYS-018	Missing Leak Rate Specification for cryo testing	No action (agreed at collocation)	Yes (done in Doors)

With Best regards,

Bernard COLLAUDIN



Signature numérique de Bernard Collaudin
ID : CN = Bernard Collaudin, C = FR, O = Alcatel Space, OU = OS/M/H
Motif : Je suis l'auteur de ce document
Lieu : Cannes
Date : 2004.10.21 19:33:20 +02'00'

1 RID-SYS-086 - HIFI FPU THERMAL INTERFACE

Discrepancy:

Ref.: H-P-ASP-MN-3923, 30/11/2003 - Industry/Instrument convergence Meeting Temperatures and heat loads for HIFI L0 and HIFI L2 are not in line with common agreements (see Ref.).
Correct values are: L0: max. 2K @ 6.8mW L2: max 20K @ 22mW
Contractor to correct within next IID-A update.

Action:

Propose a list explicit text for update IID- A reflecting the following system CDR RIDs: SYS-086, SYS-087, SYS-103

Answer

Original text of IID-A 3.3:

HIFI thermal I/F		Temp @ Heat Load											
level	thermal interface	Requirement in Operating conditions		Comments	Start-up	Swit ch-off	Non-operating		Bakeout (72h max)	Stability	Estimated max operating T	
		Max	Min (K)		Min °C	Max °C	Min. K	Max. °C	°C	Max K / 100s	K	uncertainty (K)
L0	Mixers of FHFPU (Level 0)	20K@22mW	0		NA	40	0	60	80	0.006	1.96	0.06
L1	Parts of FHFPU ** (Level 1)	6K@15.5mW	0		NA	40	0	60	80	0.006	5.37	0.18
L2	FHFPU (Level 2)	20K@6.8mW	0		NA	40	0	60	80	0.015	12.4	0.5

Table 5.7.1-2: Herschel Instrument FPU thermal requirements together with estimated worst case temperature at interface (from RD81)

Modified Text of IID-A 3.4:

HIFI thermal I/F		Temp @ Heat Load											
level	thermal interface	Requirement in Operating conditions		Comments	Start-up	Switch-off	Non-operating		Bakeout (72h max)	Stability	Estimated max operating T	
		Max	Min (K)		Min °C	Max °C	Min. K	Max. °C	°C	Max K / 100s	K	uncertainty (K)
L0	Mixers of FHFPU (Level 0)	2K@6.8mW	0		NA	40	0	60	80	0.006	1.96	0.06
L1	Parts of FHFPU ** (Level 1)	6K@15.5mW	0		NA	40	0	60	80	0.006	5.37	0.18
L2	FHFPU (Level 2)	20K@22mW	0		NA	40	0	60	80	0.015	12.4	0.5

Table 5.7.1-2: Herschel Instrument FPU thermal requirements together with estimated worst case temperature at interface (from RD81)

2 RID-SYS-087 - FPU MOUNTING HARDWARE

Discrepancy:

"HIFI and SPIRE will provide thermal compensators for their FPU/JFET mounting feet, but the corresponding bolts and washers for fixation will be provided by the industrial contractor. However the material properties (thermal expansion coefficient) of "standard mounting hardware" (bolts and washers) are not defined.
Cause the bolts are an integral part of the thermal compensation assembly (Ref. HIFI FPU ICD 455-3-001-B, sheet 3 included in Annex 1 of SCI-PT-IIDB-HIFI-02125 v3.2), both expansion coefficients are not independend from each other."

Action:

(covered by action from RID-SYS-086)

Answer

Original text of IID-A 3.3:

2.1.1.1 Herschel Focal Plane Units

……..

"The responsibilities sharing for Herschel FPU fixation hardware is as follows

Herschel FPU fixation hardware

	SPIRE	PACS	HIFI
Screw-washers	ASED	ASED	ASED
Thermal compensation	SPIRE	not needed	HIFI
Electrical insulation	SPIRE	not needed	not needed

"

Modified Text of IID-A 3.4:

2.1.1.2 Herschel Focal Plane Units

……..

"The responsibilities sharing for Herschel FPU fixation hardware is as follows

Herschel FPU fixation hardware

	SPIRE	PACS	HIFI
Screw-washers	ASED	ASED	ASED
Thermal compensation	SPIRE	not needed	HIFI
Electrical insulation	SPIRE	not needed	not needed

The material used for the FPU fixation screws is:
Stainless steel (321) A2-70 - 1.4541"

Note: In addition, ASED is preparing a detailed table of the fixation hardware actually being used that will be included here.

3 RID SYS-103 - LFI COMMENTS TO IID A

Discrepancy:

"The following discrepancies to the IID-A have been input from C. Butler LFI project Manager.
1- Sec 5.6.3.6
Warm units fixation on the SVM
So far there has been no discussion with Alcatel concerning the fixation points of MLI or the paint free zones on the warm units. We are now producing and testing the QM warm units in many cases. Some of these units might need to be used as integration spares on SVM (This is not the baseline - but you never know!). So is it not reasonable that we are all informed and agree the MLI fixation points and the position of paint free zones now? Solution is to discuss and agree these points and areas with no further delay.

2- Sec.5.7.4.2
There is no agreement between Alcatel and LFI/HFI concerning the temperature stability requirements at the interface between the Sorption Cooler Compressors and the radiator. HFI and LFI have consistently stated that the requirement to be applied to the radiator is +/- 3K/1K/0.5K, and this is a requirement and not to be considered as a goal.

3- Sec. 5.11.10 Bus Addresses
I note that there is now an agreement to use only one address for both the nominal and redundant REBA units. This was also the conclusion reached for the Sorption Cooler Electronics during the recent discussions in which it was verified that for SCS switch over etc. both coolers would never be on at the same time."

Concerning point n°1 (MLI stand-off ICD).
Discussion on the MLI standoff has been initiated (concerns HIFI warm units, LFI BEU & HFI PAU). CAD models of the MLI have been produced by Alenia/Austrian/Aerospace to converge on the interface.
ICD's for paint free areas remain to be produced. (OPEN by Alenia/AAE, included as comment in the current MLI MRR)
These items will be introduced in Annex 5 of IID-A when available.

Point 2 is being solved by update of the SCS ICD, not the IID-A

- JPL spec (6K, 2K, 1K pp) (not reachable),
- the Planck SVM expected performances (7K, 4.7K, 4.7K pp, TBC),
- and the impact of these performances at 20K on HFI (+140mK pp) and LFI (+40mW on TSA)

Point 3 was a mistake from LFI (confusion between APID (headers on TM packets), and Unit addresses on 1553 bus as clarified by these 2 mails → No change of IID-A

From: <Jean-Philippe.Chambelland@space.alcatel.fr>
To: <butler@bo.iasf.cnr.it>; <mmiccolis@webmail.laben.it>
Cc: <Bernard.Collaudin@space.alcatel.fr>
Sent: Tuesday, September 28, 2004 4:04 PM
Subject: LFI Comments to IID-A - RID SYS 103

Chris and Maurizio,

Concerning the question you asked on chapter 5.11.10 (attached below), I don't clearly understand the link between :
- the physical 1553 address of the box (18 for Nom REBA and 19 for Red REBA)
- the APID numbers
For me there is no link between the 2, so the fact that we accepted the same APID for nominal and redundant REBA unit doesn't mean that we accept to have the same 1553 address.
Could you please clarify ?

Thanks

De <mmiccolis@webmail.laben.it>
Pour : Jean-Philippe Chambelland/ALCATEL-SPACE@ALCATEL-SPACE
cc : Bernard Collaudin/ALCATEL-SPACE@ALCATEL-SPACE
<butler@bo.iasf.cnr.it>
Objet : Re: LFI Comments to IID-A - RID SYS 103

Dear Jean-Philippe,
what you understand about the link between 1553 address and APID is correct: there is no link.

The Nominal REBA respond to the 1553 bus address 18, whereas the Redundant REBA respond to the 1553 bus address 19.
Concerning the APID this is a higher level of communication issue thus since the Nominal and Redundant REBA will never be on together and the LFI seen through the Nominal REBA is identical to the LFI seen through the Redundant REBA, we decided, in agreement with the Data Management Working Group to use only one set of APIDs for TC and TM in any configuration. Thus from the point of view of the TM&TC packets there is no difference between Nominal and Redundant REBA.

I hope this clarifies the misunderstanding, anyway I remain available for further clarification.

Kind regards.
Maurizio

4 RID MTP-036 - WU RANDOM VIB QUAL LEVELS ON PLANCK

Discrepancy:

The random vibration levels for Planck 4K and HFI DPU warm units are in the normal direction: 0.2g2/Hz between 80 and 300Hz (10.91g RMS) However, the "SVM Mechanical Environment & Test Spec" H-P-SP-Al-0033 requires for the corresponding panels: 0.3g2/Hz between 50 and 300Hz (13.36g RMS) for +Y panel 0.3g2/Hz between 100 and 300Hz (13.10g RMS) for DPU

Action AI 2

ASP to update the DPU random levels in the IID-A, IN CASE Arianespace do no confirm a sufficient reduction down to 0.2g2/Hz.

Answer

The meeting with Arianespace took place on 14-15/10/04 ("Herschel-Planck/Arianespace Interface meeting: Mechanical & DCI review", ref AE/DC/ST/CR04/213).

The negotiation of the –6dB waiver for the Planck acoustic loads requirements have been initiated, and shall be justified by the project. There are no reasons to believe that this waiver will not be accepted.

Therefore, we do not intend to modify the IID-A random loads requirements for HFI DPU.

5 RID MTP-072 - IIDA - DISCREPANCIES

Discrepancy (point 3 & 5 only are associated to changes of IID-A)

3): Par. 5.6.3.4.1.5.1 - SCS Cooler fixation on SVM panel What is the meaning of the statement ?Panel external ribs are implemented to guarantee the maximal stress on the SCS pipes?

5) 5.9.1 - Herschel Power dissipations See attachment

Tables 5.9.1.1 and 5.9.1.2 are as follows:

	Power dissipation allowed on Herschel OBA interfaces (Table 5.9.1.1)	Estimation of instrument average power dissipation (Table 5.9.1.2)
Level 0	10mW	10.1mW
Level 1	25mW	34.3mW
Level 2	35 mW	0.4Mw
Level 3	15mW	26.2mW
Sum levels 1/2/3	75mW	60.90mW

Although, the sum of levels 1/2/3 of the estimated dissipation of the instruments is lower than the allowed power dissipation, there is a significant difference for levels 1 and 3 and this is not reported in this paragraph of the IIDA. The most relevant is, however, the temperature as reported in table 5.7.1.2.

Action (was on point 5 only):

ASP to update IID-A according to RID answer, and clarify scopes of tables 5.9.1.1, 5.9.1.2 and 5.9.1.3 (see RID question, point 5).

Answer

Point 3: IID-A updated according to suggestion of RID

Original text:

5.6.3.4.1.5.1: Sorption cooler fixation on SVM panel

The attachment solution proposed by Alenia (aiming to reduce the number of I/F points and to de-couple the I/Fs to the SCC) is as follows:

- the horizontal heat pipes will be directly fixed to the SVM panels, by making use of a limited number of inserts by and leaving a number of through inserts free (fig 5.3.6-9 a), b))
- then the vertical heat pipes and the spacer panels will be mounted onto the SCC (fig 5.3.6-9 c))
- finally the SCC plus heat pipes and spacers assembly, will be connected to the SVM panels by means of screws mounted from the external side through the through inserts. (fig 5.3.6-9 d))

The current baseline is based on stilts to connect structurally the sorption cooler to the panel through the heat pipe network, a 1mm baseplate between the compressor and the HP network to help on the lateral stiffness and to meet the imposed gap between SCC panel and SCC equipment. Panel external ribs are implemented to guarantee the maximum stress on the SCC pipes.

Modified text:

5.6.3.4.1.5.1: Sorption cooler fixation on SVM panel

The attachment solution proposed by Alenia is as follows:

- the horizontal heat pipes will be directly fixed to the SVM panels (fig 5.3.6-9 a), b))
- then the vertical heat pipes and the spacer panels will be mounted onto the SCC (fig 5.3.6-9 c))
- finally the SCC plus heat pipes and spacers assembly, will be connected to the SVM panels by means of screws mounted from the external side through the through inserts. (fig 5.3.6-9 d), 5.6.3-10)

The current baseline is based on stilts to connect structurally the sorption cooler to the panel through the heat pipe network. Panel external ribs are implemented to guarantee the maximum stress on the SCC pipes.

Point 5 Clarification (was already clarified in the RID answer):
Table 5.9.1.1 is the Dissipation requirement for all 3 instruments, and is used by ASED for the lifetime calculation (as max dissipation if instruments fulfil the requirement)

Table 5.9.1.2 is a proposed way to estimate the duty cycle for instruments & observation modes, assuming even distribution between instruments (1/3), and then between instruments modes. The PACS/SPIRE parallel mode has been introduced assuming 3 months of observation in that mode, taken in the PACS & SPIRE 1/3 allocations.

Table 5.9.1.3 is for information only. This is a typical average of the instrument dissipation on each level, performed using the 7 cases used by ASED to perform the transient Analysis

Proposed IID-A Update (only the new red-lined version)

"5.9.1: Thermal Dissipation on Herschel Payload Module interfaces.

The average thermal dissipation requirement to the instrument FPU's that can be supported by the spacecraft at the different interface levels of the Herschel Payload module are defined in the table 5.9.1.1 below.
The following average dissipation requirements are applicable to instruments and will be used by the H-PLM contractor for lifetime predictions.

Level	Average dissipation [mW]
Level 0	10
Level 1	25
Level 2	35
Level 3	15

Table 5.9.1-1 :Power dissipation allocawed on Herschel OBA thermal interfaces

To compare their heat losses with this requirement, instruments shall perform averaging over instruments observing time and then instrument modes.
The assumptions are 1/3 in observation mode for each instrument, and then even distribution between the instrument observation modes.
The results of these assumptions is given in table 5.9.1-2

Instrument usage

	SPIRE					PACS					HIFI							
status	**ON**			**Stdby**	Total	**ON**			**Safe**	Total	**ON**						**Stdby**	Total
duty cycle	1/3			2/3	#	1/3			2/3	1	1/3							
Mode	PHOT	SPEC	PARALLEL	OFF	Total	PHOT	SPEC	PARALLEL	OFF	Total	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	OFF	Total
duty cycle	7/48	7/48	1/24	2/3	#	7/48	7/48	1/24	2/3	1	1/21	1/21	1/21	1/21	1/21	2/21	2/3	1
Astrium Modes	3	4	6			2	1	6			5	5	5	5	5	5		

Assumption:

Even distribution for the 3 instruments (1/3 each)

Even distribution between instruments modes (Spetrometer / Photometer mode for PACS & SPIRE, Chanels 1..6 for HIFI)

3 months allocated to parallel mode (PACS + SPIRE, ie 1/12 of the mission, as part of PACS & SPIRE time (ie 1/24 taken from each of their allocation)

HIFI Channel 6 is composed of 2 sub-channels, so there are effectively 7 channels

Table 5.9.1-2 :Estimation of instruments and modes duty cycles, based on equal distribution between instruments, then between instruments modes, and assuming a total of 3 months in PACS/SPIRE parallele mode.

For information, the dissipation of the Herschel instrument FPU on various levels is estimated via the instrument FPU reduced thermal models (annexed in each IID-B), using the Herschel H-PLM thermal model (ref RD 81 (PFM) & RD82 (EQM).
The average dissipation on interfaces levels &, 2, and 3 have been estimated based on the typical transient dissipation of each instrument, and a (typical) timeline and sequencing of the instruments (ref RD 81, section 7.4.4). This is the sum of all contributions (dissipation on each levels + conductance between levels).

Level	Average Instrument heat flow on level **[mW]**
Level 0	10.1
Level 1	34.3
Level 2	0.4
Level 3	26.2

Table 5.9.1-3 :Estimation of instrument average power dissipation on levels 0, 1, 2, 3, based on typical timeline."

6 RID MTP-022 - HERSCHEL / PLANCK MASS BUDGET

Discrepancy:
'- Herschel Mass Budget: par. 2.3.1.4
Nominal mass of HIFI is 213.1kg (in version IIDB-HIFI 3.1) and allocation is 189+3 kg
Allocation mass of SPIRE (in version IIDB-SPIRE 3.3) is 90kg
Allocation mass of PACS (in version IIDB-PACS version 3.2) is 133kg
- Planck Mass Budget: par. 2.4.1.3
Allocation mass of LFI (in version IIDB-LFI 3.1) is 89kg
Nominal mass of HFI (in version IIDB-HFI 3.1) is 228.40kg and allocation mass of HFI is 244kg
Nominal mass of SCS (in version IIDB-SCS 3.0 draft 4) is 111.40kg and allocation mass is 112kg

Update mass budget and make it consistent with the applicable IID's.

Modification of IID-A
Original Text:

5.5.4 Overall Instrument Mass Allocation

Depending on the development status of the instrument the following mass margin philosophy shall apply:

- Completely new developments 20 %
- New developments derived from existing hardware 15 %
- Existing units requiring minor/medium modification 10 %
- Existing units 5 %

5.5.4.1 Herschel Instruments

The **maximum allocated mass** for the Herschel Instruments is **415 kg**.
This total mass is **distributed** to the three Herschel instruments with the following allocations:

- HIFI: 189 kg (allocation of 3 kg for waveguides are subtracted, since wave-guides are no more under HIFI responsibility)
- PACS: 133 kg
- SPIRE: 90 kg.

The present distribution of the instrument mass to the different interfaces in the system is as given in Table 5.5.4-1

Interface	**Max. allocated Mass [kg]**	**Remarks**
Optical Bench	175.5	All FPU's (including SPIRE JFETs)
Cryostat	39.6	Includes the HIFI Local Oscillator Unit (with radiator)
SVM	196.9	Warm units of all three instruments
Total	412	(+3kg for LOU WG moved to the satellite)

Table 5.5.4-1: Distribution of Herschel Instrument Mass

The margin philosophy to be applied by the instruments is outlined in paragraph 5.5.4. The instruments shall provide in the IID-B the instrument current estimated mass per unit and the related margin.

5.5.4.2 Planck Instruments

The **maximum allocated mass** for the Planck Instruments is **445 kg**.
This total mass is **distributed** to the two Planck instruments and the sorption cooler with the following allocations:

- LFI: 89 kg
- HFI: 244 kg
- Sorption cooler: 112 kg.

The present distribution of the instrument and cooler mass to the different interfaces in the system is as given in Table 5.5.4-2

Interface	**Max. allocated Mass** [kg]	**Remarks**
Planck Telescope Structure	62	HFI/LFI merged FPU, incl. HFI JFET
PPLM and SVM Warm Units	383	
Total	445	

Table 5.5.4-2: Distribution of Planck Instrument Mass

The margin philosophy to be applied by the instruments is outlined in paragraph 5.5.4. The instruments shall provide in the IID-B the instrument current estimated mass (nominal mass) per unit and the related margin.

Modified Text:

5.5.4 Overall Instrument Mass Allocation

Depending on the development status of the instrument the following mass margin philosophy shall apply:

- Completely new developments 20 %
- New developments derived from existing hardware 15 %
- Existing units requiring minor/medium modification 10 %
- Existing units 5 %

5.5.4.1 Herschel Instruments

The **maximum allocated mass** for the Herschel Instruments is **465 kg**.
This total mass is **distributed** to the three Herschel instruments with the following allocations:

- HIFI: 229 kg
- PACS: 140 kg
- SPIRE: 96 kg.

The present distribution of the instrument mass to the different interfaces in the system is as given in Table 5.5.4-1

Interface	Max. allocated Mass [kg]	Remarks
Optical Bench	180	All FPU's (including SPIRE JFETs)
Cryostat	50	Includes the HIFI Local Oscillator Unit (with radiator)
SVM	235	Warm units of all three instruments
Total	565	

Table 5.5.4-1: Distribution of Herschel Instrument Mass

The margin philosophy to be applied by the instruments is outlined in paragraph 5.5.4. The instruments shall provide in the IID-B the instrument current estimated mass per unit and the related margin.

5.5.4.2 Planck Instruments

The **maximum allocated mass** for the Planck Instruments is **445 kg**.
This total mass is **distributed** to the two Planck instruments and the sorption cooler with the following allocations:

- LFI: 104 kg
- HFI: 244 kg
- Sorption cooler: 132 kg.

The present distribution of the instrument and cooler mass to the different interfaces in the system is as given in Table 5.5.4-2

Interface	Max. allocated Mass [kg]	Remarks
Planck Telescope Structure	110	HFI/LFI merged FPU, incl. HFI JFET
PPLM and SVM Warm Units	370	
Total	480	

Table 5.5.4-2: Distribution of Planck Instrument Mass

The margin philosophy to be applied by the instruments is outlined in paragraph 5.5.4. The instruments shall provide in the IID-B the instrument current estimated mass (nominal mass) per unit and the related margin.

7 RID AVI-010 - CIRCULAR DEFINITION OF HERSCHEL +ZHSC AXIS

Discrepancy

SCI-PT-IID-A-04624 Instrument Interface Document Part A. Issue/Revision: 3.3 : p. 5-3/149, section 5.2.1
The definition text

"the ZHSC-axis is in a plane through the XHSC-axis and perpendicular to the separation plane such, that nominally the Sun will lie in the XZ-plane (zero roll angle with respect to the Sun), positive towards the Sun."

is circular, because the roll angle (alpha) can only be defined, after the +XHSC-axis,+YHSC-axis and +ZHSC-axis are defined, by the equation alpha =arctan(Sun vector y component in body system / Sun vector z-component in body system) i.e. alpha=0 <=> Sun vector in body XZ-plane.

Proposed solution:

The +ZHSC-axis (or the +YHSC-axis) has to be defined w.r.t _mechanical_ reference directions of the Herschel satellite, not w.r.t. the Sun vector, e.g.

"The XHSC-ZHSC-plane is the symmetry plane of the solar array, the ZSCA-axis pointing outwards from the solar array, in the separation plane. (Since the +XHSC axis is required to be perpendicular to the separation plane, then +ZHSC is also perpendicular to +XHSC.)"

Implementation agreed:

Original text:

5.2.1: Spacecraft Coordinate system

……………..

The Planck telescope line of sight, which is defined as the direction in which the projection of the main mirror rim is circular, is tilted 85° from the X-axis in the Z direction.
The Z-axis is in the plane normal to the X-axis such that nominally the telescope line of sight will lie in the XZ-plane, positive towards the target source. The Y-axis completes the right-handed orthogonal reference frame.
There are 3 additional frames associated to the PPLM, to the Telescope, and to the FPU, which are defined in annex 7, chapter 2, having their origins respectively in Opplm, Otel, and Ordp.

Modified text:

5.2.1: Spacecraft Coordinate system

…………………….

The Planck telescope line of sight, which is defined as the direction in which the projection of the main mirror rim is circular, is tilted 85° from the X-axis in the Z direction.
The XHSC-ZHSC-plane is the symmetry plane of the solar array, the ZSCA-axis pointing outwards from the solar array, in the separation plane. (Since the +XHSC axis is required to be perpendicular to the separation plane, then +ZHSC is also perpendicular to +XHSC.).
There are 3 additional frames associated to the PPLM, to the Telescope, and to the FPU, which are defined in annex 7, chapter 2, having their origins respectively in Opplm, Otel, and Ordp.

8 RID SYS-019 - DELETED BLANK TEST

Discrepancy
SCI-PT-IID-A-04624 Instrument Interface Document Part A. Issue/Revision: 3.3
Section 7.4.1. p.7-32
Document still refers to the PPLM blank test (now deleted).

Remove text.

OK. Remove in section 7.4.1 the following text (Done in Doors):
~~**"More, due to the late arrival of HFI, the CQM cryogenic test could be split into 2 steps: Step 1 is performed during the facility blank test without HFI (validation of PPLM passive cooling), and step 2 is performed after HFI integration"**~~

9 RID SYS-018 - MISSING LEAK RATE SPECIFICATION FOR CRYO TESTING

Discrepancy
Allowable global leak rates during testing are missing. Note: not in IID-B-LFI nor in IID-A

It is proposed to add a section
5.18 Instruments Leak requirement
For instruments with pressurized vessels (Herschel PACS & SPIRE sorption coolers and Planck coolers), the leak rate requirement from vessel to outside, at operating pressure shall be:
- SVM items: <=1.10^-5mb.l/s
- Cryogenics parts: <=1.10^-9mb.l/s
(This requirement is established to permit the instrument operation during TV tests)