From: Bernard.Collaudin@space.alcatel.fr
Sent: 29 November 2001 10:31
To: PI's_-_Project_managers@vzmta01.netfr.alcatel.fr
Cc: gerald.crone@esa.int; Jean.Bruston@esa.int;
Glenn.Lund@space.alcatel.fr; Gaia.Mandolesi@space.alcatel.fr;
Sabine.Raphel@space.alcatel.fr; mcesa@to.alespazio.it;
Edgar.Hoelzle@astrium-space.com
Subject: Change requests on IID-A

Please, find attached the e.mail version of the Alcatel changes requests on
IID-A
Number HP-ASPI-CR-21 to 25.
The signed paper version is being send in parallel.

(See attached file: IID-A Change Requests compendium-2-Signed.doc)

Bernard COLLAUDIN - Alcatel Space Industries - V7Z-A22
100, Bd du midi, BP 99 -   06156 Cannes la Bocca Cedex- France
Tel:+(33)(0) 4 92 92 30 21   Fax: +(33)(0) 4 92 92 30 10   Mob: +(33)(0)6 18
42 78 35
email: bernard.collaudin@space.alcatel.fr

ALCATEL SPACE INDUSTRIES

Instrument	Subsystem/Unit	Title of change: **all clerical errors** Alcatel comments 2, 8 10
AFFECTED DOCUMENTATION: IID-A **Document No:SCI-PT-IIDA 04624. Issue 2.0** **Chapter/Requirement:**		
REASON / JUSTIFICATION OF CHANGE (incl. impact of no-change, if appropriate): Correct clerical errors.		

DESCRIPTION OF REQUESTED CHANGE (OR NEW TEXT):

=================================

1: Consistency mass allocation IID A-B

(Alcatel comments 2)

Modify Herschel Instrument mass distribution between Optical bench, Cryostat and SVM to reflect updates of IID-B's (consistency between IID-A and IID-B) (Alcatel comment 2)

5.5.4.1

Interface	Max. allocated Mass [kg]	Remarks
Optical Bench	~~170~~ →175.5	All FPU's (including SPIRE JFET and RF filter module)
Cryostat	~~35~~→39.6	Includes a Bolometer Amplifier Unit and the HIFI Local Oscillator Unit (with radiator)
SVM	~~201~~→199.9	Warm units of all three instruments and Local Oscillator Unit wave-guides
Total	415	

==

Alcatel comment 8
5.11.3. Timing
Replace

A unique on-board time, the TAI (Temps Atomique International – ref. 1958 January epoch), is maintained at spacecraft level and distributed to the instruments in order to time-tag their data, which will be embedded in their telemetry packets.

By

A unique on-board time, the Central Time Reference (CTR) is maintained at spacecraft level and distributed to the instruments in order to time-tag their data, which will be embedded in their telemetry packets.

===
Alcatel comment 10
5.12.7: Planck Reference Star Pulse
Replace

For the Planck mission, the ACMS will provide the reference star signal.
For the Planck mission, the ACMS will provide the precise instant (+/- 1.5 msec) at which the field of view of the star mapper moved across the reference star and transmit it to ground.
The reference star pulse and precise instant as above described will be distributed to he Planck instruments with maximum delay of 5 msec.

By

For the Planck mission, the ACMS will provide the spin reference message.
For the Planck mission, the ACMS will provide the precise instant (+/- 1.5 msec) at which the the spin reference message is generated and transmit it to ground.
The spin reference message and precise instant as above described will be distributed to he Planck instruments with maximum delay of 1sec.

===
Comments from Meeting HP-ASPI-MN-581: AI 10

5.7.1.5: remove existing text, replace by TBD
5.7.1.6: Remove text and table, replace by NA
5.7.2.3.5: Remove text and table, replace by NA

5.6.1.1 Replace the number of fixation points for FPU.
Replace:

"The number of fixation points is different for each experiment: PACS 6, HIFI 3 and SPIRE 3 or 4."

by

"The number of fixation points is different for each experiment: PACS 3, HIFI 4 and SPIRE 3."

Rem: Astrium shall prepare a new section 5.6.1, according to the current OB & FPU accomodation design for further issue

ORIGINATOR	....	DATE	....
	....		

APPROVED BY			
Project Manager	....	Project Controller	....
	....		....
Date	....	Date	....

PA Manager	....	Configuration Manager	....
	....		
Date	....		....
		Date	....

ASSESSMENT / IMPACT OF CHANGE

System Design:

None

Schedule:

none

Cost:

Analyst:	Date:
Approved by:	

Instrument All	Subsystem/Unit	Title of change: Riples & inrush current (Alcatel comment # 5 and 6)
AFFECTED DOCUMENTATION: IID-A **Document No:SCI-PT-IIDA 04624. Issue 2.0** **Chapter/Requirement:5.11.3 & 5.11.5.1**		
REASON / JUSTIFICATION OF CHANGE (incl. impact of no-change, if appropriate): Change amplitude of ripples to ensure compatibility with the spacecraft (consistency between IID-A and GDIR)		

DESCRIPTION OF REQUESTED CHANGE (OR NEW TEXT):

5.9.5.3.2. Ripple and Spikes
replace

"The equipment shall operate with nominal performance when subject to the following main bus conditions:
140 mVpp Main Bus ripple
240mVpp Commutation spikes."

By

"The ripple and spikes shall be less than (at Distribution Unit output connectors):
• 300 mV peak to peak on 28 V lines.
This peak to peak value is defined in a 50 MHz bandwidth."

==

5.9.5.6.4. Inrush Current
replace:

"Inrush current is limited by the spacecraft PDU LCL to a maximum of 1.5 times the short peak value. At LCL switch-on the inrush current is limited by the PDU LCL as well as the inductance in the user input circuit.
Inrush current is limited by the PDU LCL to a value between the instantaneous peak value and 1.5 times the instantaneous short peak value.
Inrush current duration duration is set the PDU LCL. To prevent LCL trip-off users shall limit the inrush current duration to a maximum change of 5A*msec (tbc). LCL users shall limit the rate of change of inrush current to 1A/microsec."

By

At power ON of the Distribution Unit power line via the LCL, the inrush current is limited to a value comprised between 1.2 I_{max} (TBC) and 1.5 I_{max} (TBC) during a duration t (minimum value guaranteed: 10 ms)
If the inrush current demand from the user is not under limitation value at t $_{tripoff}$ the equipment will be switched off.
Figure 5.9.5.6.4.1 gives the nominal current envelope.

dI/dt < 1 A/µs

LCL I$_{TRIP}$

I$_{NOM}$

50 µs   trip-off time
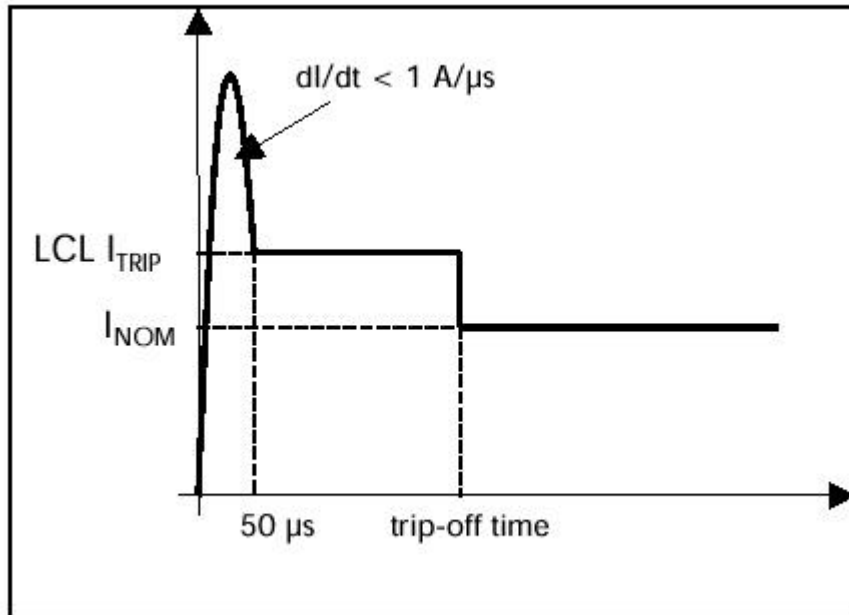
The instantaneous rate of change of current (dI/dt) variation shall not exceed 10^{-6} A/s either positive or negative.

ORIGINATOR	....	DATE	....
	....		

APPROVED BY

Project Manager	....	Project Controller	....
	....		....
Date	....	Date	....

PA Manager	....	Configuration Manager	....
	....		
Date	....		....
		Date	....

ASSESSMENT / IMPACT OF CHANGE

System Design:

Schedule:

Cost:

Analyst:	Date:
Approved by:	

Instrument **All**	Subsystem/Unit	Title of change: Timing requirements (alcatel comment 9)

AFFECTED DOCUMENTATION: IID-A
Document No:SCI-PT-IIDA 04624. Issue 2.0
Chapter/Requirement: 5.5.4.1

REASON / JUSTIFICATION OF CHANGE (incl. impact of no-change, if appropriate):

Modify timing stability requirement to be consistent with System Requirement and CDMU specification

DESCRIPTION OF REQUESTED CHANGE (OR NEW TEXT):

5.11.5.1. Synchronisation Signal
replace

"A redundant, electrically isolated synchronisation signal with a frequency of 131072Hz and an overall stability of better than $1*10^{-8}$ over 30 days will be delivered to each instrument."

By

"A redundant, electrically isolated synchronisation signal with a frequency of 131072Hz and an overall stability of better than $1*10^{-6}$ will be delivered to each instrument."

ORIGINATOR .... DATE ....
....

APPROVED BY

Project Manager .... **Project Controller** ....
....
Date .... **Date** ....

PA Manager	....	Configuration Manager	....
	....		
Date	....		....
		Date	....

ASSESSMENT / IMPACT OF CHANGE

System Design:

The system performances are not consistent with requests from LFI IID-B (6^E-9)

Schedule:

none

Cost:

Analyst:	Date:
Approved by:	

Instrument	Subsystem/Unit	Title of change:
Herschel	HPLM	EMC changes (Alcatel comments 7,11,12,13)

AFFECTED DOCUMENTATION: IID-A
Document No:SCI-PT-IIDA 04624. Issue 2.0
Chapter/Requirement:

REASON / JUSTIFICATION OF CHANGE (incl. impact of no-change, if appropriate):

(Alcatel comments to IID-A)

DESCRIPTION OF REQUESTED CHANGE (OR NEW TEXT):

Pages Affected	Text to the change
5-61 (alcatel comment 7	§ 5.10.3.5 Correction : "Commentary : In case DC-to-DC converters are manufactured « ad hoc » for specific applications, it is recommended to use static shields between primary and secondary windings of the transformer. It would reduce the capacitive coupling between primary and secondary side. This static shield should be connected to the ~~primary power return line~~ **chassis** via a low inductance strap." *Rationale : the connection of the static shield to the primary power return line would provide only HF differential mode rejection, but no common mode rejection at all, unlike the connection of the static shield to chassis.*

5-86 (alcatel comment 11	§ 5.14.3.9
	Figure 5.14.3-6 replaced by the following one :

Radiated Emission - E Field

Rationale : the notch corresponds to the S/C TC band.

5-87
(alcatel comment 12)

§ 5.14.3.13

Correction :

"No malfunction, degradation of performance or deviation beyond the tolerance indicated in its individual specification shall occur when the subsystem equipment and its interface lines are exposed to a repetitive electrostatic arc discharge of at least ~~5.6~~ **15** mJ energy/ 15 kV. **The current rise time shall be less than 10 ns.** ~~For conducted test only,~~ if damage risks are envisaged for interface circuits, the voltage can be reduced down to 4 kV but the energy shall remain 5.6mJ."

Rationale : energy level changed from 5.6 mJ to 15 mJ to be consistent with SRS. Rise time specified, as critically affects the ESD current coupling to circuits.

5-88
(alcatel comment 13

Paragraphs 5.14.4 through 5.14.6 cancelled

Rationale : agreed in EMC/Power WG meeting #9, the detailed information being in the IID-B's.

ORIGINATOR	....	DATE	....
	....		

APPROVED BY

Project Manager	....	**Project Controller**	....
	....		....
Date	....	**Date**	....

PA Manager	....	**Configuration Manager**	....
	....		
Date	....	**Date**	....

INDUSTRY ASSESSMENT / IMPACT OF CHANGE

System Design:

Schedule:

none

Cost:

Analyst:

Approved by:

Date:

Originator: B.Collaudin/P.Rideau

Instrument	Subsystem/Unit	Title of change: **Tests requirements** Alcatel comments 14, 15, 16

AFFECTED DOCUMENTATION: IID-A
Document No:SCI-PT-IIDA 04624. Issue 2.0
Chapter/Requirement:

REASON / JUSTIFICATION OF CHANGE (incl. impact of no-change, if appropriate):

Consistency with EVTR. (Environment and test requirements)

DESCRIPTION OF REQUESTED CHANGE (OR NEW TEXT):

==================================

(Alcatel comment 14)

9.5.2: test level tolerances

change table (old)

Parameter	Remark	Tolerances
Temperature (ambient)	Tmax and Tmin are the max. and min. nominal temperatures for a specific test	Tmax: + 0°C … + 3°C Tmin: - 0°C … - 3°C
Temperature (cryogenic)		To be tailored to test and temperature range
Pressure	Equal or above 0.1 mbar: Below 0.1 mbar:	10% 50%
Relative Humidity		± 5%

Parameter	Remark	Tolerances
Sinusoidal Vibrations	Acceleration Frequency above 50 Hz	+/- 10% ± 2%
Random Vibrations	Power spectrum density (50 Hz or narrower): 20 to 500 Hz 500 to 2000 Hz Overall g RMS	 ±1.5 dB ± 3 dB ± 1.5 dB
Static Force		± 5%
Acoustic	see tolerances in	
Mechanical Shock	±0.05xA where A is peak response from semi-sinusoidal shock pulse	
For the mass properties measurements, the following tolerances apply:		
Weight		± 1%
Centre of Gravity		± 1%
Moments of Inertia		± 5%
For the electromagnetic compatibility, the following tolerances apply :		
Voltage Amplitude		5% of the peak value
Current Amplitude		5% of the peak value
RF Amplitude		tbd
Frequency		tbd
Distance		tbd
For the magnetic properties, the following tolerances apply :		
Mapping distance measurement:		tbd
Displacement of assembly Centre of Gravity (COG) from rotation axis:		± 5 cm
Vertical displacement of single probe centre line from COG assembly:		± 5 cm
Mapping turntable angular displacement:		tbd
Magnetic field strength:		tbd
Repeatability of magnetic measurements (short term):		tbd
De-magnetising and magnetising field level:		tbd

TO (new table)

Parameter	Measurement Range	Tolerances
Temperature	• -55°C to +180°C - maximum temperature - minimum temperature • below –55°C and above 10 K - maximum temperature - minimum temperature • below 10 K - maximum temperature - minimum temperature	0°C/+ 3°C - 3°C/0°C 0K/+1 K -1 K/0 K 0K/+0.1 K -0.1 K/0 K
Pressure	- p > 0,1 mbar - p < 0,1 mbar	< ± 1 % ± 10 %
Solar intensity		± 3 %
Relative Humidity		+ 5 % RH
Static test	Force	0 % / 5 %
Sinusoidal Vibration	Acceleration/amplitude Frequency below 50 Hz Frequency above 50 Hz	0 % / +5 % ± 0.5 Hz ± 2 %
Random Vibration	Power Spectral Density (g^2/Hz) Overall g RMS	-1 dB/ +1.5 dB ± 10%
Acoustic Vibration	1/3 octave band overall	-1.0 dB/3.0 dB (63 to 2000 Hz) -2.0 dB/4.0 dB (31.5 Hz) -1.0 dB/3.0 dB
Shock response	(Q=10) 1/6 octave band	± 3.0 dB
Test Duration		0 %/ 5 %
RF Power Level		< ± 0.3 dB
Spurious level	< -20 dBc and up to 80 dBc	< ± 0.5 dB
Frequencies	Audio < 20 kHz Video > 10 MHz Video < 10 Mz	10 ppm 1 ppm 0.01 ppm
Voltage	< 5 Volt > 5 Volt	≤ 0.2 % ≤ 0.5 %
Current	< 1 A > 1 A	≤ 0.5 % ≤ 0.1 %
DC Power		≤ 1.0 %
VSWR		0.2 dB
Leak Rate		±10^{-5} Pa m^3s^{-1} of Helium at 1013 hPa pressure differential

==========================

(Alcatel comments 15)

<u>9.5.3.3.2 Sine Vibration Test Levels and Duration</u>
change

Acceptance levels are to be derived by dividing the qualification levels by a factor 1.5.

by

Acceptance levels are to be derived by dividing the qualification levels by a factor 1.25.

====================================

(Alcatel comments 16)

9.5.3.4: Random Vibration Tests
change
      Acceptance levels are to be derived by dividing the qualification levels by a factor 2.25.
by
      Acceptance levels are to be derived by dividing the qualification levels by a factor 1.5625.

ORIGINATOR	....	DATE	....
	....		

APPROVED BY

Project Manager	....	Project Controller	....
	....		....
Date	....	Date	....

PA Manager	....	Configuration Manager	....
	....		
Date	....		....
		Date	

INDUSTRY ASSESSMENT / IMPACT OF CHANGE

System Design:

None

Schedule:

none

Cost:

Analyst:	Date:
Approved by:	