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Herschel / Planck Project SPIRE-ESA-COM-001197

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from	A. Heske (SCI-PT)	extension	55467		
to	M.Griffin/Cardiff K.King/RAL	n°fax	via e-mail		
copy	SPIRE IBDR Board Members	n°fax	via e-mail		
subject reference	**SPIRE IBDR : Major Points and Detailed Comments**				

Dear Matt, dear Ken,

With this letter the Review Board would like to convey the major points inferred from the detailed comments received from the review team on your IBDR documentation. For your information a list of detailed comments, as received from the reviewers and not yet fully consolidated, is attached to this letter.

It was decided that no RIDs are issued prior to the IBDR meeting; they will be consolidated after the Board has seen the presentations.

The Board appreciates SPIRE's detailed assessment of their critical issues, as demonstrated with their Critical Items List. The Board would like to highlight the following points:

- **Project Team Situation**
  - It is noted with concern that, due to the funding situation, a slow-down of SPIRE Project Team activities seems to be unavoidable. The impacts should be assessed and priorities proposed.

- **Instrument System Design**
  - A system FMECA is still missing. This was also one of the major points for the IIDR. A way forward should be presented.

- **On-Board Software and Operability**
  - The documentation provides only limited visibility into software development and verification. Plans should be addressed.

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- **Mechanisms**
  - The documentation does not provide clear evidence whether these complex and vital cryo components will have the required performance. This becomes particularly important in the view of SPIRE's assessment of the BSM as a critical item.

As stated earlier, RIDs will be consolidated after the Review Board has evaluated both, the documents and the presentations.

With best regards,

Astrid Heske
For the SPIRE IBDR Review Board

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SPIRE IBDR – List of individual comments, not yet fully consolidated (26/02/02)

Subject	Reference/ DOC	Paragraph	Comment	Recommended Solution	Priority	Org.
AIV facilities development plan (v.1.0, Apr. 01)	SPIRE-RAL-PRJ-000477	p. 10	Concern on status and schedule of calibration facilities (cryostat and related lab / telescope).	Provide additional clarifications on status of activities. Provide evidence of schedule compliancy.	Medium	NR
AIV plan	SPIRE-RAL-PRJ-000410, issue 2.1	10	An explanation of the columns in the matrix is missing: Mode I 1 - I4 and Test ID1 to Test ID5.	To be added	High	JR
AIV plan	SPIRE-RAL-PRJ-000410, issue 2.	10	Some additional data is needed for the matrix: references to the actual documents where verification is reported, test reports, analysis etc, reference to applicable waivers.	To be added	High	JR
BSM development plan (v.5.0, July 2001)	SPIRE-ATC-PRJ-000466	page 25	No information on status of BSM launch damper / lock and 2-axis prototype / DM / Status of back-up design? Serious concern on CQM delivery schedule.	Provide additional clarifications on status of activities. Provide evidence of schedule compliancy. Increase effort as required.	Medium	NR
BSM development plan (v.5.0, July 2001)	SPIRE-ATC-PRJ-000466	page 98	No information on qualification of BSM motor and sensors. No evidence of dedicated testing. No info on alternative design of the BSM. The BSM presents high risk of delay.	See also launch lock Verify their compatibility with flight and the cryogenic environment. Reinforce PA. Perform dedicated tests.	High	NR
CIDL	SPIRE-RAL-PRJ-1134, issue 1.0,	3	A section with the customer requirements should be added to the CIDL, IID-A, IID-B, PA requirements etc.	To be added	High	JR
CIDL	SPIRE-RAL-	3	The CI numbers should be added to all	To be added	High	JR

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	PRJ-1134,		entries in this section.			
CIDL	SPIRE-RAL-PRJ-1134,	3	A section with open change documents (NCD, RFW, CR, etc.) should be included in the documents.	To be added	High	JR
CIDL	SPIRE-RAL-PRJ-1134,	3.2	More detailed drawings and interface drawings should be available at this stage and included in the document. For reference to detailed drawings on sub-system level a reference to the respective CIDL is required.	To be added	High	JR
CIDL	SPIRE-RAL-PRJ-1134,	3.4	The CIDLs on sub-system level shall be added to this or a new section to ensure completeness and traceability	To be added	High	JR
CIDL	SPIRE-RAL-PRJ-1134,	3.4	The SPIRE CIDL itself shall be added to this section	To be added	High	JR
CIDL	SPIRE-RAL-PRJ-1134,	3.3, 3.5	There are several open points in this section on issue and revision that should be filled in.	To be added	High	JR
CIL	SPIRE-UCF-PRJ-1138, issue 1.0,	general	The issue on the front page is 1.0 while on the following pages draft	To be updated	low	JR
CIL		2	The table with critical items should also contain a column with the specific measures or actions that are being taken in order to control the items. Right now this is hidden within the description for some of the items, while not available for some items	To be updated	High	JR
CIL		2	There are no critical items from the FMECA. Is this correct?	To be clarified	High	JR
CIL		2	There are no critical items concerning cleanliness and contamination, even if the risk analysis in the Cleanliness plan	To be clarified and updated	High	JR

			identifies several critical issues on this subject that would require special attention during different phases of the project. It is not clear how this is controlled.			
CIL		Item 10	This comment raises a major concern for the situation of future PA activities in the project since the status of the PA documentation is not up to the required level already at this point with a lot of documents already missing or late. The coming phases of the project will require a lot of attention from PA in order to ensure the reliability of the instrument, and the concern is to how this will be ensured.		High	JR
Cleanliness plan	SPIRE-RAL-PRJ-1070, issue 1.0,	general	This document is more of a cleanliness budget and risk and contamination risk analysis than an actual cleanliness control plan.	The document should describe specifically how it is planned to meet the cleanliness requirements set forth by the budget and how to control the contamination risks identified in the analysis throughout all phases of the project.	High	JR
CM plan			The configuration management plan is missing	Provide document	High	JR
CQM Instrum. level test plan (v. 0.1, Jan.2002)	SPIRE-RAL-DOC-001049/8	Page 13	Very little information is provided on actual instrument functional verification and calibration. Calibration plan is missing.	A detailed functional verification & calibration plan must be produced.	High	NR
Datapack		SW Development Plans	No document or section describing the specific activities required for the production of SW is available. This is specially critical in order to plan in advance and evaluate the effort of SW Verification and Validation activities.	Please provide some visibility on the intended plans for SW development, both for DPU and MCU SW's.	High	JQ
Datapack		HW/SW ICD's	No document or section describing the characteristics of the HW where each	Please provide some visibility on the HW elements more attached to the SW, how they	Med	JQ

			OBSW is to be embedded. This implies a great risk as it precludes any forehand evaluation of SW design decisions.	have to be operated and what are the timing characteristics of these HW elements, both for DPU and MCU SW's.		
Design Description	SPIRE-RAL-PRJ-000620	General	Bolometers, Sorption Coolers (also applicable to PACS) and the thermal busbar (TBC) make use of tensioned kevlar cables to provide a mechanical support and thermal isolation of suspended items. Under sustained tension loading Kevlar is susceptible to creep. It also exhibits a negative coefficient of thermal expansion. Both factors will tend to reduce the pre-tension in the cables resulting in a loss in stiffness and lowering of resonant frequencies of any supported items. Some investigations into this behaviour have been made by CEA (for the Sorption coolers - report not in IBDR data package), but problem appears not completely understood or solved.	Recommend investigation into of use of Kevlar in these applications to confirm if creep and negative CTE will make this design feasible. If necessary this hsould indicate what modifications to the current design solution are necessary and what actions may be required during assembly and integration to preserve adequate tension in the cables to maintain the required dynamic performance of the system.	High	GCo
Design Description	SPIRE-RAL-PRJ-000620	Sect. 4.10.1, Pg. 108	Stated notching philosophy for random vibration specification is not agreed. In general nocthing is only allowed so as to limit the interface forces to quasi-static levels. Any other considerations must take account of the overall dynamic behaviour of the satellite.	In principle any notching to the mechanical vibration environment should be approved by the prime contractor, therefore no specific action necessary. Text can be modified as part of any general update of document.	Low	GCo
Design Description	SPIRE-RAL-PRJ-000620	Sect. 4.10.1, Pg. 108	Stated notching philosophy for random vibration specification is not agreed. In general nocthing is only allowed so as to limit the interface forces to quasi-static levels. Any other considerations must take account of the overall dynamic behaviour of	In principle any notching to the mechanical vibration environment should be approved by the prime contractor, therefore no specific action necessary. Text can be modified as part of any general update of document.	Low	GCo

			the satellite.			
Design Description	SPIRE-RAL-PRJ-000620	Sect. 4.10.1 Table 4-8	Mechanical requirements are given in Table 4-8 for complete FPU only. No similar requirements are given for internal subsystems (E.g. BDA's, BSM, SMEC etc.). Mechanical amplification is expected to result in higher dynamic loads for these internal components (higher levels are listed in the SMEC Development Plan - LAM.PJT.SPI.NOT.200001 but the source is not clear).	Provide mechanical requirements for internal subsystems of FPU. Provide explanation also how the relevant mechanical environments are calculated and what updates to such environments can be expected.	Medium	GCo
Design Description 1.0 (4/2/02).	SPIRE-RAL-PRJ-000620	page 78	No detailed information is provided on the spider-web bolometers, their fabrication, testing and calibration (e.g. sensitivity micro-vibration environment).	This is a severe omission in the review. Increase level of visibility. Produce documentation.	High.	NR
Design Description 1.0 (4/2/02).	SPIRE-RAL-PRJ-000620	p.17/35	Continuous movement of the FTS mirrors (scan mode) may induce microphonics noise and affects the detector performance.	No detailed analysis of this effect. Provide test results, perform early verification measurements.	Medium	NR
Design Description 1.0 (4/2/02).	SPIRE-RAL-PRJ-000620	p.24/25	Lack of redundancy on most of the SPIRE subsystems is a major concern. Too late to add redundancy as this requires major re-design.	Improve level of detail of FMECA and FDIR. Put more emphasis on early S/S testing and reliability verification.	High	NR
Design Description 1.0 (4/2/02).	SPIRE-RAL-PRJ-000620	page 55, 90	No detailed design of the spectrometer and of the SMECm unit. Only conceptual design available in the documentation.	Provide information on actual status and preliminary tests. Increase level of design. Perform dedicated tests.	High	NR
Design Description 1.0 (4/2/02).	SPIRE-RAL-PRJ-000620	page 17-18, 78-80	Proper operations of the BDAs require high temperature stability. No clear what measures have been taken to include any thermal control hardware in the design of the detector assembly.	The design of the thermal control hardware should be brought forward and engineering models should be tested included in the CQM testing.	High	NR
Design Description 1.0 (4/2/02).	SPIRE-RAL-PRJ-000620	page 55	Microphonics effect: The use of tri-axial cable should be considered. The inner shield could be guarded, the outer shield	If these is feasible and applicable cannot be judged because of the missing details in documentation provided.	High	NR

			grounded. This would reduce microphonics effect.			
Design Description 1.0 (4/2/02).	SPIRE-RAL-PRJ-000620	Page 49,50	Since the grounding scheme seems to be complex and critical a clear grounding schematic should be provided as soon as possible. What are the question marks in figure 3-26 ?	Provide clear grounding scheme.	Low	NR
DML	SPIRE-ATC-PRJ-710, issue 0.2	Appendix A	Item 19. Name and type column.	Explain which varnish is used	***High***	BD, AdR
DML	SPIRE-ATC-PRJ-710, issue 0.2		Item 22. Name and type column. Composition of QMW Black missing	Explain the composition	High	BD, AdR
DML	HSO-SBT-LI-004, issue 1.1	3	Item 6-2. Material is not given	Explain what material is used	High	BD, AdR
DML			Item 7-1. Tin. What is used SnPb or pure Sn	To be clarified	High	BD, AdR
DML	SPIRE-IFS-DOC-001031, issue 1.0	6	The environment code is unknown	Provide environment code	High	BD, AdR
DML	SPIRE-IFS-DOC-001031, issue 1.0	general	The doc reference is the same as for the DPL	To be corrected	low	BD, AdR
DML	SPI.PFM.00.LM.01.A	general	The data shall be according to the format in PSS-01-701	To be updated	High	BD, AdR
DML	MSSL/SPIRE/PA002.01, issue 1.0	Category 12: Item 1 & 2	These items are part of processes and should not be in the DML	These items should be in the DPL	medium	BD, AdR
DPL	SPIRE-RAL-PRJ-1093, issue 1	front page	The front page reads: Combined DML and the header Combined DPL	To be corrected	low	BD, AdR
DPL	HSO-SBT-LI-	3	Item 7-1. How is the varnish removed	To be clarified	High	BD,

	005, issue 1.1					AdR
DPL	HSO-SBT-LI-005, issue 1.1		Item 8-1. Reference to soldering qualification is missing	Reference to be added	High	BD, AdR
DPL	HSO-SBT-LI-005, issue 1.1		Item 10-1, 11-1, 11-2. Specification reference missing	Provide reference	High	BD, AdR
DPL	HSO-SBT-LI-005, issue 1.1		Item 13-1. Column 5: 2 “Removal of polluting particles…”	Explain how particle removal is done	High	BD, AdR
DPL	SPIRE-IFS-DOC-001031, issue 1.0	general	The doc reference is the same as for the DML. The header on each page reads: DPU Declared Components list Materials List Processes List	To be corrected	low	BD, AdR
DPL	SPIRE-IFS-DOC-001031, issue 1.0	7.6	Item 2. Reference to the qualification of the process is missing	Provide reference	High	BD, AdR
DPL	LAM/ELE/FTS /011009.01, issue 0.0	Item 1 & 2	Reference to qualification for SMT soldering etc. is missing	To be updated	High	BD, AdR
DPL	LAM/ELE/FTS /011009.01, issue 0.0	general	issue is 0.0.	To be formally issued	low	BD, AdR
DPL	MSSL/SPIRE/ SP004.11	general	On page 2-4 it is issue 1.0, then 0.1	To be corrected	low	BD, AdR
DPU/ICU OBSW URD	SPIRE-IFS-PRJ-000444	Section 4	The graphical notation used for the DFD and Architectural diagrams seems not to correspond exactly to the one defined in reference 2 (Derek J. Hatley and Imtiaz A. Pirbhai, Strategies for Real-Time System Specification. NewYork, N.Y.: Dorset House Publishing, 1987). In particular the use of some elements as asterisks and shadowed bubbles and boxes is not explained in the reference. In addition it seems that DFD’s and CFD’s (Control Flow	Please clarify the details of the used notation that are not compliant with the reference document and methodology.	High	JQ

			Diagrams) have been mixed in a common one. These differenced preclude the correct understanding of the architecture of the application.			
DPU/ICU OBSW URD	SPIRE-IFS-PRJ-000444	Section 3	SW requirements are not complete. The references to URD requirements are not enough. Explicit SW requirements have to be provided for each functionality.	Complete the section with all the counterparts to the User Requirements.	High	JQ
DPU/ICU OBSW URD	SPIRE-IFS-PRJ-000444	Section 2	Model Description is empty.	Complete it.	Med	JQ
DPU/ICU OBSW URD	SPIRE-IFS-PRJ-000444	Section 3.5	Resource Requirements	Please provide the technical budgets to be respected in each phase of project development in terms of program memory occupation, CPU load, etc.	Med	JQ
DPU/ICU Subsystem Development Plan	IFSI/ICU/PL/2000-001	page 22,23	Since the verification process is identified a extremely complex (page 22) and critical a very clear verification and test plan should be issued early in the development phase. Verification details are missing (like in Herschel Project SPIRE-IFS-PRJ-001036 CNR, page 14 & 25)		High	NR
ECR status report	SPIRE-RAL-PRJ-1080, issue 1.0,	general	A reference to the document which approves the change request should be given	To be added	medium	JR
EMC Control Plan	SPIRE-RAL-PRJ-852	page 15	The grounding diagram presented at page 15 of the EMC Control Plan (and page 5-28 of the IIDb) is not 100% clear. In its present status it is extremely difficult to assess the correctness of the diagram. For instance, shield connections are very unclear and there seems to be even a shield gap at inside the CVV.	Consider to revisit the diagram: - use standard symbols (e.g. analogue/digital ground and filters) - specify how the shields are connected (e.g. backshell) - provide an overview of the grounding diagram (system level) and some detailed diagrams for the subsystems and their relevant inter-		FM

				connections (e.g. detectors-JFP/JFS, detectors/JFETS-WE).		
EMC Control Plan	SPIRE-RAL-PRJ-852	Page 25.	The susceptibility threshold specified in the IIDa is applicable to the warm units only. Within the CVV a different limit will be applied.	To addressed within the EMC working group		FM
EMC Tests		EGSE documentation	- To ensure that during the EMC tests the ambient noise is at least 6dB below the limits, the EMC requirements specified in the IIDA shall be made applicable to the EGSE	. In one of the EGSE documents there should be a chapter with the EMC requirements that the EGSE has to comply with		FM
FDIR policy in the SPIRE instrument	SPIRE-RAL-PRJ-001128	General	The document is very good. It is very clear. It outlines a sound, robust, simple policy with minimum demand on the CDMS. It recognises that further work based on a completed FMECA is required			PE
FDIR policy in the SPIRE instrument	SPIRE-RAL-PRJ-001128	General	The "services" required from the CDMS and associated SPIRE-supporting OBCPs which need to be run in the CDMS need to be defined more precisely	Work is on going in the Instrument-ESA-Industry Data Management Working Group.		PE
FDIR policy in the SPIRE instrument	SPIRE-RAL-PRJ-001128	general	My only concern is that this FDIR policy (and this cannot be avoided) places de-facto "new" requirements on the DPU OBSW, which, according to the available documentation is already designed and (at least partly) coded. Will this S/W retrofit be possible without major disruption on the existing DPU OBSW design?	assess, scope effort required and include into the overall DPU test and validation planning.	high	PE
FDIR policy in the SPIRE instrument (Febr.02)	SPIRE-RAL-PRJ-001128	General	FDIR is extremely shallow.	Enrich level of FDIR. Major additions are required.	Medium	NR

FEM Analysis	SPIRE-MSS-PRJ-001141	Sect.4, Pg. 9	F.E. analysis uses a model of FSFPU with a mass of 42.34Kg compared to an IIDB allocated mass of 48.5Kg (Sect.5, SCI-PT-IIDB/SPIRE-02124).	It is recommended to perform the analysis with mass scaled to 48.5Kg, as the lower mass will give non-conservative sizing of structure and mechanical interfaces.	Medium	GCo
FEM Analysis	SPIRE-MSS-PRJ-001141	Sect.8, Pg 13	Random vibration profile appears not correct with regard to specification (Sect. 9.5.3.4 SCI-PT-IIDA-04624), as the down slope appears to start before 300Hz. The RMS for the specification input also appears not correct ($5.27g_{rms}$ IIDA, vs $4.15g_{rms}$ in F.E. analysis) However, the actual levels are not repeated in the reference document. Therefore cannot be easily compared. This remark applies also to the proposed notching.	Check levels of specification. Add table to list the specificationrandom vibration levels and the proposed notching.	Medium	GCo
FEM Analysis	SPIRE-MSS-PRJ-001141	Sect.8, Pg 13	Notches proposed for random vibration are made by limiting the 4sigma interface forces due to random vibration to the quasi-static interface forces. The random vibration interface forces should be calculated using a 3sigma criterion. In addition values given in Table 4.3 are unclear as it seems to imply the listed values are 4sigma values, whereas it is more likely these are 1sigma values.	Review and update notching proposal. Add clarification to (or correct) Table 4.3.	Medium	GCo
Finite element analysis of the SPIRE structure (Jan.02)	MSSL-technote-SPIRE-08	page 7	Not clear if the finite element analysis includes a realistic model of the thermal straps, whose failure is single point critical.	Clarify	Low	NR
FMECA			The system FMECA is missing	Provide document	High	JR
FMECA Assessment of	SPIRE-RAL-NOT-000319	Page 15, 17	FMECA does not include possibility of higher operating temperature of bolometers	Assess impact on performance of BDA. Identify max temperature compatible with scientific	High	NR

system level failure effects (4/01)			(T>300 mK) resulting from increased heat load/partial cryo-system failure.	requirements. Run simulations.		
HSIA			The Hardware software interaction analysis is missing	Provide document	High	JR
Major milestone list (v.1.3, Dec.2001).	SPIRE-RAL-PRJ-000455	p. 6,10	No time to input STM test results into CQM. Very limited system testing before delivery. Development and CQM programme show delays (need vs. planned date) which could seriously jeopardise the CQM delivery	Absolute need to introduce additional slack time between the tests of the STM and the integration of the CQM.	High	NR
Manufacturing flow charts with MIP/KIP			The manufacturing flow charts including MIPs and KIPs are missing from system and sub-system levels	Provide document	High	JR
Mechanical Environment	General		With the exception of the SPIRE FSDPU Structure, there is no analysis reported which demonstrates the instrument can survive the mechanical launch environment. It is therefore not possible to assess the general adequecy of the mechanical design at this stage.	Recommend priority to providing analysis/justification of mechanical design.	Medium	GCo
Microphonics		general	A theoretical analysis of the microphonic disturbances to the instruments is missing.	Given the extreme sensitivity of the detectors and the critical environment (cryogenic cables) I find this issue should be investigated.		FM
Operating modes for the SPIRE instrument	SPIRE-RAL-PRJ-000320	p. 16	: "ON" Mode	should be a chapter on its own (chapter 3.3)		PE
Operating modes for the SPIRE instrument	SPIRE-RAL-PRJ-000320	p. 16:	In which mode is on-board software patching of the DRCU carried out? In REDY mode?	clarify		PE

Operating modes for the SPIRE instrument	SPIRE-RAL-PRJ-000320	p. 17:	COCA mode: It should not be possible to ignore limits on "health" parameters in this mode -instrument safety issue!- proper combination of "soft" and "hard" limits should allow testing without sacrifying safety..	SPIRE to comment		PE
Operating modes for the SPIRE instrument	SPIRE-RAL-PRJ-000320	p.17	It seems that TEST should be a specific mode, entered from REDY, exited from REDY.	SPIRE to comment		PE
Operating modes for the SPIRE instrument	SPIRE-RAL-PRJ-000320	p 24-25	: It is recommended that transition from OFF to STBY is always done under ground control. At the end of an observing period SPIRE should not be switched to OFF but should remain in STBY. Please comment.	SPIRE to comment		PE
Operating modes for the SPIRE instrument	SPIRE-RAL-PRJ-000320	p. 27:	Point 8 and table 4-7	replace STANDBY by REDY (point 8). Replace COOL by CREC (table 4-7)		PE
Operating modes for the SPIRE instrument	SPIRE-RAL-PRJ-000320	p. 28-44	: Most photometer observatory functions (POF1 to POF7) require spacecraft functions which are not easy to simulate (e.g. Nodding, Line scanning, Rastering). It is not obvious how the corresponding AOTs can be realistically tested	SPIRE to comment		PE
Operating modes for the SPIRE instrument	SPIRE-RAL-PRJ-000320	p38	p38: POF4: It seems that this means fixed time observations. Is this the correct understanding?	Clarify		PE
Operating modes for the SPIRE	SPIRE-RAL-PRJ-000320	p. 44	POF7: Peak up: this mode is only equivalent to POF3 in its baseline implementation (BSM). In the non-baseline	clarify		PE

instrument			implementation, CDMU and ACMS need to be involved. At which point in time will the choice of baseline versus ACMS implementation be made? It seems that this will have to be done post-launch with possible implication on S/C and Instrument OBSW..			
Operating modes for the SPIRE instrument	SPIRE-RAL-PRJ-000320	- p. 54-55:	degraded operations: These modes are outlined (good!). It is stated (rightly) that they must be planned for and thoroughly tested before launch. Have the corresponding activities (implementation + characterisation + tests) been considered in the overall planning?	Clarify		PE
Operating the SPIRE instrument	SPIRE-RAL-DOC-000768	General	The document is very good. The structure is very clear. It is recognised that the description of several instrument operations (e.g. cooler recycle, memory checking, etc.) still needs to be provided. There are also several TBW's in the description of the building blocks,	These missing elements are not considered to be a problem at this stage **provided** that the information will be available in time for the ILT's. Please check that this is the case.		PE
Operating the SPIRE instrument	SPIRE-RAL-DOC-000768		The document which has only been issued very recently places de-facto "new" requirements on the DPU OBSW, DRCU OBSW (TBD) and possibly on the DPU - DRCU interface. Since the OBSW (at least for the DPU) is already designed and (at least partly) coded it is not clear that these new requirements can be accomodated without major disruption on the existing OBSW designs.	**:** the extent of the required modifications must be assessed, the effort required should be scoped and the corresponding tests included in the overall DPU/DRCU test and validation planning.	high	PE

Operating the SPIRE instrument	SPIRE-RAL-DOC-000768	chapter 7	: the meaning of **interface** (sections 7.1 to 7.3.) is unclear. What is missing here? The same "interface" definition in sections 7.4. to 7.7 merely provides a list and description of parameters. Parameters are already included in sections 7.1 to 7.3.	clarify	low	PE
PA plan			The PA plan is missing	Provide document	High	JR
RFW status report	SPIRE-RAL-PRJ-1081, issue 1.0,	RFW 2	The reference for RFW 2 is missing	To be added	High	JR
RFW status report	SPIRE-RAL-PRJ-1081, issue 1.0	Waiver or deviation column	What does 1 stand for in this column? Waiver?	To be clarified	medium	JR
RFW status report	SPIRE-RAL-PRJ-1081, issue 1.0	Status/remarks column	The Prime contractor and ESA status is given as “1”. What does 1 stand for? Open?	To be clarified	medium	JR
Software requirements document	DPC-SQ-CGS-001	Page 16	ADSP-21020 is an obsolete part at AD and consequently no software updates and maintenance on the described products has been done.	Make sure that all known alerts and problems around this development platform are understood and measures are taken to overcome existing bugs.	Medium	NR
WCA			The Worst case analysis and derating analysis is missing	Provide document	High	JR