

**Minutes of SPIRE Project Team Meeting, 30 April 2003**  
**Matt Griffin, 7 May 2003**

**Present:** Matt Griffin (chair), Eric Sawyer, John Delderfield, Ken King, Doug Griffin, Eric Clark, Chris Brockley-Blatt, Dave Smith

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**1. IHDR preparation status**

- The documentation list was reviewed - see Section 9 for current status
- The next status review will be on May 15 - there are many actions to be completed by then - PT members should endeavour to address them before the meeting on May 15.

**2. Model philosophy**

- The proposed revision to SPIRE's model philosophy will be presented at the Interface meeting next week.
- The compelling rationale is that we must start the FM at the end of 03 to have any chance of Jan. 2005 delivery. This requires contraction of STM/CQM programme, and also allows earlier CQM delivery (Jan/Feb. 04)
- The original programme is viable but CQM delivery would be late. The FM might not be late on paper but the schedule risks would be greater.

**2.1 Subsystem schedule issues**

- The deliverability of the DRCU and cooler are to be studied..
- DRCU:
  - The first DRCU model could be a reduced model - needs to drive only one channel plus the cooler.
  - DRCU model philosophy in telecon planned for May 7.
  - If there's a problem with needed electronics, options would be:
    - propose to lend electronics to ESA only for short EPLM test campaign;
    - use GSE as a best efforts work-around;

- delay the start of PFM for a couple of months (but this would nullify the main advantage of the new approach).
- DPU:
  - Next model due July/Aug. May be delayed to November due to ASI problem. Should be OK but need to confirm with IFSI that we'll get it in time.
- Cooler:
  - FM cooler needed November.
  - Lionel has said July is OK for CQM cooler but the PFM cooler not started yet so Nov. 03 not possible.
  - Plan for resolving the issue:
    - [Action: Eric to brief Jean-Louis and Lionel, Laurent by E-mail as to the nature of the problem](#)
    - Issue to be discussed in SAp telecon on May 7
  - Baseline must be for Lionel to build a cooler to the current FM design
  - No further cooler design changes are possible, regardless of the results of thermal tests going on now.
  - A consequence of this may be impossibility to meet the hold-time requirement

### 3. STM test status

#### 3.1 STM warm vibration test

- The STM has been vibrated warm in all three axes to full qual levels (with a minor reduction of the sine levels negotiated with ESA (Thijs van der Laan) during the campaign.
- No problems identified in post-test low-level sine sweeps
- FPU is currently under post-test inspection
- Various routine NCRs raised
- Test campaign has been very successful and beneficial - congratulations to all involved for their dedication and excellent teamwork.

#### 3.2 Alignment

- LAM team will be at RAL on Tuesday for alignment check
- Problem with CM3 - incorrect optical axis: LAM will remake mirror.
- Work-around will be needed for first alignment checks

#### 3.3 AIV facility cryostat

- First cold run of test cryostat completed - meeting scheduled for Friday to review results and on lessons learned
- Procedures for purging and flushing of He pots to be revised
- Warm-up took a bit longer than expected
- He-4 hold time at least 72 hrs
- 2-K level got down to 1.9 K. Hold time to be demonstrated but Dave is confident that it will be adequate.
- Thermal conductance between 10-K shroud and HOB plate needs improvement
- Next cooldown will be for cold optical alignment
- Congratulations to Dave and his team for successfully commissioning the system.

### 4. Thermal strap status

#### 4.1 Liaison with industry/ESA

- Industry/ESA have agreed to 100 mW K for each of the three straps vs. our request of 300, 150, 150. We've also asked to move the interface to make our strap shorter

- ESA are requiring Astrium to provide their subcontractors with specifications rather than designs
- The cooler design has to be frozen in the immediate future - we will not modify the evaporator strap.
- Other than that, no aspects of SPIRE mechanical design are being held up by the lack of definition of the system
- Next steps:
- John expects to get visibility of Air Liquide's proposed L0 strap design soon

#### 4.2 L0 strap programme at MSSL

- John is working on the design. Worries about the load on the cooler - Berend and John are modelling it.
- 99999 Al wire tests start next week
- L0 strap programme at MSSL (Chris)
- [Action: Chris to define a schedule with appropriate milestones to get us from now to completed manufacture ready for cold test - installation 7 August. Deadline May 15.](#)

#### 4.3 Other straps

- Level 1
  - Our mechanical design is not being held up
  - Electrical isolation is on our side and we need to address that
- Level 3 (JFETs)
  - Electrical isolation is also to be defined. Implementation is by RAL. Resourcing for this is an open issue.

### 5. Project Team organisation

- Project Team effectiveness needs to be improved to cope with the increasing demands of system integration, the need for sustained and disciplined liaison with the subsystems, and continuing interaction with industry and ESA.
- In recent months, contacts with the subsystems have suffered due to the pressure of work on the STM programme.
- Monthly reports from the subsystems have dried up, with only CEA and Grenoble producing one this month, and SPIRE has not submitted any monthly reports to ESA since Dec. 2002
- The resources of the Project Team are always going to be stretched - in this circumstance, the Project Team must implement prioritisation by review/analysis and "wilful neglect" rather than loss of control and consequent "forgetful neglect".
- The following new practices will be adopted with immediate effect:

#### A. Weekly telecons

- There will be a weekly telecon with each of the major subsystems, following the model currently adopted with JPL
- These telecons are to be minuted with a specific and timetabled action list to be tracked in subsequent telecons
- The following PT members shall organise and chair the telecons:
  - Eric                    LAM, Cardiff, CEA, MSSL
  - Matt                    JPL (regular telecons already routine)
  - Ken                     IFSI, Lethbridge
  - Doug                    ATC, Grenoble
- Besides the organiser, other PT members shall participate as appropriate.
- At the regular Project Team meetings, each organiser will present brief reports on the status of the relevant subsystems

- The telecons shall be used to
  - produce subsystem monthly reports.- in real time if necessary
  - monitor the status with respect to a complete and agreed set of delivery dates
  - identify problem areas and appropriate solutions
  - implement and monitor configuration control on subsystem and interface documentation.
- **Actions:**
  - Organisers as identified above to take steps immediately to institute weekly telecons.
  - Eric to send an e-mail to institute PMs explaining the new system and stressing the telecons and monthly reports are mandatory.
  - Matt to e-mail Co-Investigators (as individuals responsible for subsystem deliveries) emphasising the importance of professional and sustained communication between institute managers and the SPIRE Project.

## B. Implementation of full configuration control

- All documents that the Project controls are to be issued for signature ASAP, even if they contain TBDs (to be cleared up later by mutual agreement).
- "Signature" can be by e-mail message confirming agreement. If necessary, lack of response shall be taken as indicative of agreement.
- The Project Team organisers as listed above shall organise the necessary activity via weekly telecons

Action: Eric Clark to send out e-mail to local PA managers about the process:

Action: Ken and Eric will draw up a list and farm out to subsystem telecon organisers listed above.

## 6. DRCU DDR follow-up

- The DRCU Programme Review report needs to be followed up, in addition to a number of other issues that have arisen in the meantime.
- These issues are to be addressed at weekly telecons with SAp, starting May 7
- The May 7 telecon should include discussion of:
  - SPIRE DRCU Prog Review actions/recommendations
  - Cooler delivery date problem also

## 7. Next meetings

- May 15 (2 hrs in the morning) for IHDR status update/panic.
- May 23 for next full PT meeting

## 8. Action list (not including IHDR preparation actions)

No. + Mtg	Action	Responsible	Due date	Status
1 Apr. 30	Brief Jean-Louis, Lionel, Laurent by E-mail as to the nature of the cooler schedule problem	Eric	Before May 7 telecon	
2 Apr. 30	Define a schedule with appropriate milestones to get us from now to completed manufacture ready for cold test - installation 7 August.	Chris	15 May	
3 Apr. 30	Take steps immediately to institute weekly subsystem telecons.	Organisers identified	7 May	

		above		
4 Apr. 30	E-mail institute PMs explaining the new system and stressing the telecons and monthly reports are mandatory.	Eric	7 May	
5 Apr. 30	E-mail Co-Investigators emphasising the importance of professional and sustained communication between institute managers and the SPIRE Project.	Matt	7 May	
6 Apr. 30	Send out e-mail to local PA managers about the configuration control procedure.	Eric C.	7 May	
7 Apr. 30	Draw up a list of to-be-signed-off documents and distribute to subsystem telecon organisers listed above.	Ken + Eric	7 May	

## 9. IHDR documentation status and relevant actions

Green = Document available

Blue = updates

Red = actions

No. and Priority	Document	Responsible	Current Status	Plan
<b>Top-level requirements documents</b>				
1 3	Scientific Requirements Document	Matt	No update needed	
2 2	Instrument Requirements Document	Bruce	Routine update via ECR needed: - Removal of shutter - SMEC spec. mods - BSM latch removal - Other small ones	Bruce will send out one big ECR to go out on Friday 2 May. Doc. will be updated by 15 May.
3 2	Calibration Requirements Document	Bruce	Ground calib sections OK - In-flight sections need some attention .	No update for IHDR. Will not be done until after IHDR. Will work closely with Sarah Leeks over the next year

<b>Instrument Design Description and Development Plan</b>				
4 3	SPIRE Design Description Document	Doug	Matt's updates done and given to Doug, except sensitivity model.	<b>Doug</b> will revise over about 1 day by <b>May 23</b> . Aim is to clear up any major bits that are out of date. <b>Matt</b> to provide sensitivity model update by <b>May 23</b> .
5 1	Instrument Development Plan	Ken/Eric	To be updated. Will be in the same format as for the IBDR.	Top priority doc for the review. Old version to be updated. <b>Eric</b> to produce reviewable version for <b>May 23</b> .
6 3	EMC control plan	Doug	Update needed to include grounding scheme change and modelling/test plans	<b>Doug</b> to produce addendum to existing document explaining changes and work in progress by <b>May 15</b> .
7 3	Microphonics control plan	Doug	Working version to be produced for review. Change plan: produce test	Outline to be produced by <b>Doug</b> ready by <b>May 30</b> .

			specification for CQM.		
<b>IID-B and related documents</b>					
8	3	IID-B	John D.	Under Alcatel control - we'll provide status report and list of important items/issues from our point of view.	OK
9	1	Thermal Model document	AnSo	Status: John sent out a version for comment.	<b>John</b> to provide new configured version by <b>May 30</b>
10	1	FPU Mechanical Model	Berend	Berend validating the model using STM tests. Berend back 24 <sup>th</sup> .	Include new subsystem spec note in IHDR pack. <b>Berend</b> to write short top-level account of the model by <b>June 1</b> .
11	1	Harness Definition Document	Doug	V1.1 is out for signature. If 1.2 available then OK.	
12	3	Stray light model document	Tony R.	No update needed. Internal SPIRE description is still correct but not the external parts - make clear to RB.	<b>Bruce</b> to provide Marc Ferlet's technote verifying Astrium ASAP model to Eric for inclusion in doc list. by <b>May 15</b> .
13	1	Budgets spreadsheets	John	To be updated - routinely.	Review status May 30.
<b>OBS</b>					
14	1	OBS URD	Sergio	RAL have commented on latest version.	<b>Ken</b> to give Sergio deadline of <b>May 15</b> to produce new version.  Old version is adequate if needed.
15	1	OBS Architectural Design	Riccardo	Exists in draft. Needs a lot of work.  Telecon took place. Sergio agreed to produce update by early May.	New version needed for April 30. Ken to liase with IFSI on this. <b>Matt</b> to contact Paolo and arrange telecon (Ken, Sergio, Renato, Riccardo). Suggest: Friday 4 <sup>th</sup>  <b>Ken</b> to check with Sergio and state deadline of <b>May 15</b> for reviewable version.
16	3	Operating Modes Document	Bruce, Matt, Sunil	Minor updates needed. Parallel mode needs to be sorted out. Telemetry rates need to be reviewed and updated using Ken's input.	No update planned. Some bits need updating as part of normal work
17	1	Operating the Instrument Document	Sunil	In draft form and needs updating. More detail on low-level ops. Based on latest command list.	<b>Sunil</b> to produce new version by April 28.  <b>Sunil</b> to produce new draft by <b>May 26<sup>th</sup></b> . Review <b>May 30</b> .
18	2	SPIRE Data ICD	Ken	Was issued for DPU acceptance tests. But needs further update based on CEA ICD.	Normal work. Latest version will be provided for the review.
<b>AIV Plan</b>					
19	1	Warm Electronics integration plan	Eric	Needs updating. Dave and Samuel are working in the detailed functional test plan next	Will be presented at industry meeting next week.

			level of detail)	Review status 15 May. Final version by end May
20	1  3	FPU integration plan	Chris  Eric	FPU will have been integrated. MSSL responsibility.  Subsystem integration procedures need to be added (maybe just put in a list)
21	1	Alignment Plan and Alignment Procedures	Kjetil	Will have been carried out. No update needed. Will be refined as procedures done.

22	1	Instrument-Level Test Plan	Dave Smith	STM: to be reviewed.	We submit - the original (IBDR version) ILT plan - an account of current status  Action: <b>Dave</b> to provide originals for STM and CQM.  Draft ECR to be produced by <b>Bruce and Dave</b> explaining: - changes so far; - changes under consideration; - explanation of the rationale.  Deadline: Draft ECR to be available for <b>May 15</b>
23	1	Manufacturing Flow Charts	Eric Clark	Already contained in ILT plan - no need to produce a separate document.	
<b>GSE</b>					
24	3	GSE Overview	Ken/Bruce	No update needed on IBDR version	

<b>PA</b>					
25	2	SPIRE PA Plan	Eric Clark	Has never been approved by ESA. ESA (PO) comments to be taken into account.	<b>Eric</b> to produce new version to by <b>May 15</b> .
26	2	SW PA Plan		Included in PA plan	
27	1	FMECA	Bruce	Update needed. Harnesses to be included. Doug has done harness/detector analysis. Bruce will review and interpret this. Ken and Bruce doing system aspects	No progress to date. Review again <b>May 15</b> .
28	1	Configuration Management Plan		No update needed. Same as IBDR.	OK
29	2	Cleanliness Control Plan	Bruce	Comments from Jan to be taken into account.	Procedures have been written and they will be referenced.  Today's version can be submitted.
30	1	Configured Items Data List	Eric Clark	Exists for the STM/CQM and is under config control (not "frozen"). Not in ESA's preferred format but does	Will be reviewed. <b>Eric C.</b> to update for IHDR by <b>May 1</b> .

			contain needed information. Will not be reformatted.	
31	1	Critical Items List	Matt and Eric Sawyer	To be updated using format ESA have suggested. <b>Matt to produce new draft by May 15</b>
32	2	Safety submission/analysis	Eric Clark	Submission has been produced and submitted. Lionel is to send cooler input this week. Review status on <b>May 15</b>
33	1	Worst Case Analysis		DRCU: Limited version in DRCU review documentation. DPU: <b>Ken and Eric C to review new version that has been received.</b> Review status April 28. <b>Eric made some comments to IFSI. No response yet. Eric C to provide the docs to Eric S by May 15.</b>
34	2	Part Stress Analysis and derating analysis		Contained in Warm Electronics PA plans. Also needed for SPIRE-provided harnesses. Review status on April 28. <b>Doug to write short note referring to the relevant subsystem docs and assessing harness issues not covered therein by May 15.</b>
3	1	FDIR	Bruce	To be written before H/W-S/W interaction analysis. Bruce and Ken have started. Draft to be available on April 28. <b>Bruce and Ken to produce fault-tree analysis by May 15.</b> Draft doc. to be provided for review.
36	1	HW/SW interaction analysis	Ken and Bruce	To be written based on format agreed with Jan. Significant work needed Same exercise as FDIR.
37a-e	2	a EEE Parts list, b PAD sheets c DML d DPL e DMPL	Eric Clark	PAD sheets: IFSI, CEA to be contacted for latest information <b>Eric C to provide Eric S with updated version by May 15.</b>
38	1	Verification Control Document	Eric S./Bruce	"Verification Plan" was issued for IBDR. AIV plan includes basic verification matrix. <b>Bruce and Eric to discuss and review by 11 April.</b> <b>Covered elsewhere - is being covered in the AIV plan and the ECR on it.</b>
39	3	Test Procedures		<b>Dave to provide the available test procedures on May 15.</b>
40	1	NCR and RFW status lists	Eric Clark	Snapshot to be provided. As many as possible will be closed out. <b>Eric C. to send Eric S. the current list on May 15.</b>
<b>For each subsystem</b>				
41	2	All DDR Document sets with any updates made since the DDR	Eric	Each subsystem to provide updated versions (if appropriate) of their DDR document sets. Only IFSI have responded so far. <b>Eric S. will contact subsystem managers on this.</b> <b>ATC: Matt and Eric raise tomorrow.</b> <b>LAM: Eric check.</b>



				<p>MSSL: OK except for ICD vib levels.</p> <p><b>Matt</b> to e-mail Co-Is to stress urgency of subsystems to provide their CIDLs and the documents.</p> <p>All to be done by <b>May 15</b></p>	
42	1	All DDR Review Board Reports (several need to be formally issued)	Eric/Bruce/Doug	<p>BSM: done (Doug)</p> <p>DRCU: done (Matt)</p> <p>Cooler: done (Bruce)</p> <p>Calibrators/Filters - to be done (Bruce)</p> <p>Structure - to be done (Eric)</p> <p>DPU - to be done (Ken)</p> <p>300-mK + delta - done (Doug)</p> <p>JPL: Include NASA review reports</p> <p>SMEC/Mirrors - to be done (Bruce)</p>	<p>It is essential that these be completed for the IHDR</p>
43	3	List of available STM EIDPs and Acceptance Review Minutes as available.	Eric Clark		
44	1	Technical reports to demonstrate subsystem design compliance and maturity.	Bruce/Eric S.	Nothing reviewed.	<p><b>Eric S.</b> to contact subsystems by <b>May 3</b> requesting them to provide all relevant reports.</p>