

**Minutes of SPIRE Project Team Meeting 21**  
**SPIRE-RAL-MOM-001097**  
**RAL 21 January 2002**

Present: Matt Griffin (by phone), Eric Sawyer, Bruce Swinyard, Ken King, Berend Winter,

**Topics.**

FMEC

IBDR preparations

300mK strap

DRCU meeting

PA meeting

**1 Review of outstanding actions from previous meetings**

No. PT-04-0570	Actionee	Description	Priority	Deadline	Status
01	KJK	Write WE integration and test plan	High	Oct. 2001	<b>Still Open. Needed for IBDR. In progress</b>

No. PT-10-0682	Actionee	Description	Priority	Deadline	Status
04	MJG	Arrange for QMW to evaluate filter suppression.	Medium	May 31	<b>Closed, Matt to send Bruce correct version of note</b>

No. PT-12-0726	Actionee	Description	Priority	Deadline	Status
02	EC KJK	Update the document management plan to reflect the new scheme for interaction of institute PMs with the documentation configuration control system.		June 29	Still open, action being taken This is an action on Ken

No. PT-13-0772	Actionee	Description	Priority	Deadline	Status
04	BMS DKG	Bruce and Doug to talk to John and distribute a draft list of documents showing approval status.		3/8/01	closed
06	MJG	Matt to meet with Ken to discuss the outstanding MOUs		3/8/01	Open. JPL, in progress Canada, draft proposed Others, no progress
11	ECS	Outline new document scheme to the consortium			Closed

No. PT-15-0824	Actionee	Description	Priority	Deadline	Status
02	ECS	Review product tree		12/9/01	Open

No. PT-16-0862	Actionee	Description	Priority	Deadline	Status
01	DG	Doug to inform consortium that 1030 Cernox is the baseline temperature sensor		20/9/01	Closed
02	BMS	RAL (Bruce) to write a DRCU reliability spec at the channel level which also defines a failure.		20/9/01	Closed
04	ECS	Send costs of cold vibration tests to LAM and CEA. +JPL		30/9/01	Open
08	CEA/ SAP	CEA to check when harness information is required.		30/9/01	Closed
10	RAL	Warm interconnect harness. (DRCU to DPU) One delivered with QM1, is another harness required for QM2? RAL to clarify		30/9/01	Closed, Two required
11	BMS	Put on Livelink The version of the BDA SSSD, taken by Matt from JPL		30/9/01	Open
15	SAP	Provide provisional mass breakdown for the meeting on 25/9/01		24/9/01	Open
16	MJG	Clarify with KJK when the ICC workpackages will be defined		30/9/01	Open, will be available end Jan
17	JD	Check general robustness of P/LW photometer array and take this into account in harness partitioning			Closed, Included in latest interface definition doc.

No. PT-19-1060	Actionee	Description	Priority	Deadline	Status
1	ECS	Define the build standard of all STM subsystems.			Open

## 2 Project Management Issues

### 2.1 IBDR preparations

Preparation workshop Friday 4 Jan at RAL.

#### DOCUMENT STATUS

No. and Priority	Document	Responsible	Current Status	Plan
<b>Top-level requirements documents</b>				
1 P3	Science requirements document	Matt	No significant update planned.	
2 P2	Instrument Requirements Document	Bruce + Matt	Needs various updates. To be done by ECRs.	ECRs issued, doc not updated yet Finalise by: Jan 18 Matt and Ken to sign. All subsystem managers must also sign. Issue signed at system level. Issue 1.1, A change request to cover missing cooler update. Issue 1.2 will be signed by all subsystems
3 P1	Calibration Requirements Document	Bruce + Matt	Being written.	Part complete, Draft by 20 Dec Finalise by: Jan. 18 Issue as is
<b>Instrument Design Description and Development Plan</b>				
4 P2	SPIRE Design Description Document	Doug (+ Bruce and Matt)	To be updated following DDRs (just basic updates)	Send Sap a word version to update. Matt to update over Christmas. Doug to send Matt a word version. DDR docs to be put on CDs Finalise by: Jan. 18. Ready soon, to be reviewed before issue.
5 P1	Instrument Development Plan	Ken/Eric	To be updated. Will be in the same format as for the IIDR.	Review by: Jan. 18 To be ready for 4/3/01
6 P2	EMC control plan.	Doug	Draft exists. Being reviewed by ESA. Frequency plan needs to be incorporated.	Frequency plan now available from SAP. Finalise by: Jan. 25. Ready 4/2/01
<b>IID-B and related documents</b>				
7 P3	IID-B	John D.	Under Alcatel control - we'll provide status report and list of important items/issues from our point of view.	Maintain document through normal work with ESA/Alcatel ECS contact ESA to clarify position. No action required. Ask

				ESA what version to use.
8 P2	Thermal Model	Sam	To be updated based on latest available information at end of November.	No cryostat model available yet Thermal model will not be updated for the IBDR documentation. Instrument model will be updated. Matt to supply new info. Issue on 4/2/02
9 P1	FPU Mechanical Model	Berend	To be produced	Will be produced by MSSL To RAL by 31/1/02, Issue on 4/2/01.
10 P3	Harness Definition Document	John D.	Exists. Minor revisions possible.	Keep updated and present the latest version. JD to confirm JPL interface, this is ongoing. Confirmation from SAP required. Layout required from MSSL, target 8/1/02. Check status of RAL supplied harness. Temperature sensor location has been defined.
11 P2	Stray light model	Tony R.	To be updated. Inputs expected from ASEF. Input needed from ASER (but not expected).	Use existing model/report do not wait for updates from ASEF and ASER.
12 P1	Budgets spreadsheets	Doug	To be updated after DRCU review.	Info from DRCU is now available. Keep updated (JD) and present the latest version as of info from Dec. 20. Chase John D Issue 4/2/02
13 P2	Optical error budget	Kjetil	New version exists	To be reviewed by Bruce. Finalise by Jan 18. Can be issued now.
<b>On-Board Software</b>				
14 P1	OBS URD	Anna	Exists. Won't be updated.	There will be unclosed change requests. Issue now
15 P1	OBS Architectural Design	Riccardo	In progress. IFSI need to produce some additional technical notes. Ken to liase with Riccardo.	To be finalised at OBS DDR (Dec. 6, 7) A note has been written, but needs refining into a proper document. Comments to DDR presentation to be sent to IFSI by Ken. Matt to contact Renato and Paulo expressing our concern about progress of docs. Still open needs progressing, Ken to draft.
16 P2	Operating Modes Document	Bruce, Matt, Sunil	To be updated. Needs a 1-day meeting between Matt, Bruce, Sunil.	Meeting: Dec. 3 held. Draft. By Dec. 20 Finalise by: Jan. 15

				Note on parallel mode to be written by Matt Target after Christmas, a further review will be required. Check before issue
17 P3	Operating the Instrument Document	Sunil	In progress. Needs DRCU ICD. Not high priority for IBDR.	Draft: Dec. 10 Finalise by: Jan. 18 Use whatever is available at the time of the IBDR Issue as draft
18 P1	SPIRE Data ICD	Ken	To be written. Needs DRCU ICD for completion.	Draft: Dec. 20 Finalise by: Jan. 18 Info from SAP received, iterations required. Draft version partly completed, only a draft will be available for the IBDR

#### AIV Plan

19 P1	Warm Electronics integration plan	Ken and Eric	Scope to be discussed by Eric and Ken. Document to be written by Eric.	Finalise by: Jan. 18 Issue by 4/2/01
20 P1	FPU integration plan	Berend	To be written	New version dated 21/12/01 available, some extra info required, but its almost good enough. This version will be issued.
21 P2	Alignment Plan and Alignment Procedures	Kjetil	Docs. being reviewed.	Alignment plan complete to be checked by Bruce. Alignment procedure, use what exists at the time of the review.
22 P1	Instrument-Level Test Plan	Dave Smith	Being written.	Finalise by: Jan. 18 Draft available
23 P3	Manufacturing Flow Chart	Dave Smith	We assume that this is at instrument level. May be incorporated in AIV Plan.	Finalise by Dec. 10 Done

#### GSE

24 P1	GSE Overview	Ken/Bruce	Brief overview with pointers to DDR data packs for the details. May be incorporated into the AIV plan.	Draft: Dec. 20 Finalise: Jan 15 Started
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#### PA

25 P1	FMECA	Bruce	Subsystem DDRs include FMECAs. Instrument-level FMECA to be based on * key results of subsystem FMECAs * analysis of harness/end-to-end channel redundancy * scientific impact of failure modes	Draft by: Jan. 18 Finalise by: Jan. 28. Bruce to tackle top level analysis in Jan Clarification received from ESA <b>Top level only will be done for IBDR documentation, further progress before March, consider extra effort from outside the system team e.g. onractor.</b>
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				<b>Subsystem FMECAs to be assessed by system team</b>
26 P3	Worst Case Analysis	Bruce/Matt	Warm Electronics DDRs should include this. DDRs to do it. Clarification has been requested on what is required at instrument level.	TBD. May have to wait until January. Matt to do top level analysis based on instrument sensitivity. Should be done by electronics subsystems.
27 P3	HW/SW interaction analysis	Ken	To be written (control loops?). Clarification has been requested. on what is required at instrument level.	TBD. May have to wait until January. Will not be done
28 P1	FDIR	Bruce	To be written. Clarification needed from ESA on what's required. Will be based on two levels of parameter anomaly: serious - switch off now and not-so-serious - raise an anomaly report.	Draft: Dec. 10 Finalise by: Jan. 18  Philosophy only for documentation pack.
29 P2	Cleanliness Control Plan	Bruce	Exists. To be updated.	Finalise: Dec. 20 Draft available, to be finalised by 18/1/02 Can be issued
30 P2	EEE Parts list	Eric Clark	To be collated from DDR data packs.	Finalise: Dec. 10
31 P1	Verification Matrices	Eric S.	Exist. To be collated.	Finalise: by 4/2/02
32 P1	Configured Items Data List	Eric Clark	List of all configured documents.	Finalise: by 4/2/02
33 P3	Critical Items List		Need clarification from ESA	Out put from FMECA Will be done by 4/2/02
34 P3	Change Requests and Waivers List	Eric Clarke	Exists - just needs to be printed out.	Finalise: 4/2/02
<b>Additional Documentation to be available for the Panel</b>				
35 etc. P3	All DDR Document sets All DDR Review Board Reports All agreed Interface Control Documents Technical notes and papers as deemed appropriate by the Project Team		Some need to be updated and placed on Livelink.	To be placed on Livelink and on the CD.

## 2.2 Management Reporting and Control

## 2.3 Document change and configuration control

IIDB.

ESA are requesting that SPIRE sign off 2.1 excluding the ECRs and document changes identified during a dedicated meeting. This is not acceptable to the SPIRE project and needs further discussion.

## 2.4 PA

## 2.5 Business Agreements

## **2.6 Schedule:**

### **3 Instrument Issues**

#### **300Mk strap**

RAL

Vibration testing carried out to MSSL spec.

No significant failure encountered.

Test rig suffered some damage.

First mode at 300Hz but low amplitude.

Next mode about 800 Hz with higher magnitude.

Accommodation study carried out. Shows this system can be accommodated.

Effects of tension on the alignment of the spectrometer box needs to be addressed by MSSL, Doug to give Berend the forces.

MSSL

No testing carried out, some analysis done.

Some tests will be done before the next meeting on 30/1/02. (13:30 start)

Cardiff

Final assembly being done now. (mark 1 version)

Vibration data should be available before the 30/1/02

Mark 2 should be available soon.

Analysis to identify the resonance frequency of the system needs to be carried out if possible.

#### **3.1 Structure**

Discussions with suppliers has resulted in good response from one company. Design modifications have been suggested which will reduce cost and time. They can work from 3D models. RF seal will be modified to a groove on both sides with a separate tongue.

These changes should improve schedule and minimise integration time.

#### **3.2 Mirrors**

#### **3.3 Detectors**

Budget problems still exist.

Agreement on no delay of CQM programme.

Staggered delivery not desirable, but will be assessed by system team.

Can JFET be delivered with detectors rather than before? This prevents early testing of the cryo test harness.

JPL to propose changes to their programme, system team to asses impacts.

#### **3.4 OBS and Instrument Control**

#### **3.5 DPU**

#### **3.6 DRCU and related issues (Sap)**

## 4 ICC Issues

### 5 Meetings:

ESA requested a meeting to discuss interface issues and mass etc dates of 13 and 15 Feb are proposed.

PA meeting.

ESA have asked for SPIRE to combine subsystem PM and P list. Eric has not agreed to do this for the IBDR, but for delivery. Spire do not plan to do this and will tell ESA that a document consisting of several annexes will be produced, Eric S to tell esa

Generally SPIRE seem to be in good shape.

Critical items list needs establishing, Matt to initiate and discuss with Bruce.

DRCU meeting

Instrument development plan will be based on new info from SAP.

Deliveries are generally in line with instrument requirements.

A new schedule will be available at the end of this week.

### 5.1 Detailed design Reviews

#### 5.1.1 DDR summary

- Mirrors: Complete
- FTS: 22/23 Nov 2001.
- DRCU/WIH 12/13 December.
- Structure/thermal straps 29/30 Nov 2001
- DPU: 6/7 Dec
- AIV 6/9/01, delta review required, to include egse.
- EGSE: TBD, see above
- BDAs:/JFETs Complete, ICD, FMECA and PA map outstanding
- Filters/calibs: 18/9/01, Complete
- BSM: 30/7/01 not all issues closed out, delta review on 23/8/01, complete
- OBS Requirements review required. Probably Nov
- Shutter PDR: July 17, Almost a DDR, some aspects still open.
- Cooler Complete, some RIDs to be signed off.
- DRCU simulator TBD, awaiting spec from Sap.

## 6 Progress on Open Issues

### 7 AIT

### 8 AOB

FMECA.

Phase one (£15K +VAT) is no use on its own and requires phase two to be any use.

Phase two is expected to cost a similar amount.

To do this work in house would cost about 2/3 of the SEA quote.

Global redundancy scheme is unlikely to change.

FDIR should be an output of the FMECA

Extra spend on system engineering causes problems, extra time spent on IIDB issues.



Extra spend on thermal modelling is expected.

Extra spend on optics.

Under spend in previous months has been spent on other things.

All budget lines need to be reassessed to make sure that the overall spend is within budget.

Effort on optics should be reduced to Tony doing stray light analysis only. No checking of any new configuration files. No further diffraction analysis.

Management: 50% Ken, 50% Eric S, 30% Eric C. (Eric C is currently at 80%, he should carry on until the IBDR and then reduce to 30%)

Conclusion is that we should not proceed with the SEA FMECA analysis, but do an in house analysis, Matt to draft note to ESA.

### **Next meeting**