Minutes of SPIRE Project Team Meeting 7 / 8 SPIRE-QMW-MOM-000591

Dates: QMW 22 January 2001 + RAL 13 February

Present: Matt Griffin, Ken King, Bruce Swinyard, Doug Griffin (13 Feb. only)

1. Review of outstanding actions from previous meetings

See Annex A: Open items are indicated in RED - readers please check any open actions that they need to complete.

Action 1: KJK to check with DP what LAM's plans are for writing FPU simulator requirements relating to the MCU.

2. Report from JPL visit

- Bruce Swinyard, Berend Winter and Doug Griffin visited JPL/Caltech last week
- Entire JPL programme was reviewed, including technical design and the Dev. Plan.
- Went through electronics, wiring configuration.
- Numerous issues raised in John Delderfield's memos were discussed - not completely resolved - need to be revisited when John is back at work.
- Wiring diagram for bolometers reviewed
- BDA-JFET cables electrical and mechanical specifications defined
- Grounding scheme - was reviewed by Doug and Viktor Hristov - may need further iteration.
- Crosstalk model reviewed
- Microphonics discussed. Amplitude of impulse response depends on detector resistance. Possible explanation: surface charge on cable insulators. Planck-HFI cables have graphite insulator. This topic is important for future FPU commonality meetings.
- Discussion on how to get cables out of the box: Structure design and thermal strap implementation reviewed. Fibre support concept difficult. This is a major worry for the FPU development programme.
- BDA design is close to the limit on Kevlar tensile strength - only 20% margin? There is concern about possible snapping under shock load - this needs clarification.

Action 2: DG to clarify whether BDA design is compatible with IID-A requirements
Action 3: MJG set up meeting on thermal strap and light baffle design and development programme.

- Discussion on routing of cables - new scheme proposed. Internal and external cables will be hard-mounted to metal surfaces. Disadvantage is higher cable capacitance. MSSL will draw up revised cable routing. JPL working on capacitance budget. JPL need to consult with Tekdata on the practical implementation.
- Manganin adopted rather than stainless steel for FPU harness
- Visit to SPIRE and HFI labs at JPL
- Verification programme: 77-K vibration baselined.
- Receivables and deliverables gone through and itemised.
- List of milestones compiled
- BMS and JJB will compile and agree the JPL Dev. Plan. Which will be part of IIDR documentation.
- Cryoharness test plan devised.

- EMC modelling:
  - Plan to make structure mock-up to measure attenuation - Doug is looking into this with Berend.
  - Could be useful for testing EMC gasket performance etc.
  - LIA needs to be included in the EMC model
  - I^2R heating needs to be taken into account
  - All ingredients needed for EMC model are now available
  - Noise and signal levels at various points now known
- Next meeting of JPL team with Project Team arranged for late June at RAL

3. Immediate priorities for Systems Engineering

John Delderfield is still off work so effort is limited and must be prioritised. Current priorities for Doug Griffin are:

1. Instrument Design Description Document
2. IID-B update not high priority but cryoharness definition is as this is long lead-time item. The rest will have to wait until JD returns.
3. Fridge recycling thermal modelling - low priority for now.
4. EMC modelling - simple model to be run by end Feb. 13

4. IIDR preparation

- The SPIRE IIDR will be on April 23, 24 (venue RAL)
- The IIDR will be based on formal documents, with presentations just highlighting the key points.
- Most of the work for the review needs to be done by the Project Team, but vital inputs are needed from the institutes, especially on their Development Plans and schedules.

Plan for review preparation:

- The list of documents and presentations as suggested by ESA (see attached document - Annex B) is appropriate and we can work to that. We need to add the AIV facility which isn't covered in ESA's list of topics.
- The main aims for our technical meeting with ESA on Feb. 27 will be
  - to have a consolidated schedule and development plan
  - to present and hopefully get ESA agreement on our model philosophy and AIV plan

For the IIDR we will need to have the following documents in good shape:

- **Inst. Desc. Doc.**
  Doug Griffin is working on this. A good draft would be nice, but not essential, for the Feb. 27 meeting with ESA.

- **IID-B**
  Was to be updated for Feb. 27 but deferred until return of JD.

- **Development plan and AIV plan**
  It should be available to send to ESA by Feb. 20
  Main parts are:

- **SPIRE Verification Requirements Document** by BMS
  Draft has been circulated. Needs to be read and signed by all institute mangers.

It includes explanation and description of the model philosophy.

Action 4: KJK to review and finalise draft Verification Requirements Document with Bruce. Distribute to PMs on Friday 16 with action to agree by Feb. 20.

- **AIV Plan** by BMS.
  - This has been updated to new model philosophy.
  - Matrix relating IRD requirements and tests at instrument level is nearly complete.
  - Some updates needed after clarifications at JPL meeting.
  - Explanatory text to be written.
  - Good draft will be available for presentation at the 27th and distribution to consortium at the same time.

- **FPU Integration Plan:** Berend to write. Draft exists.

  Action 5: BMS check status of FPU integration plan with Berend Winter.

- **Alignment Plan:** Exists. Needs to be reviewed. Could make this coincide with review of FTS programme at the end of March (recommended by the recent CNES review of Herschel/ Planck).

  Action 6: BMS to ask Dominique Pouliquen about proposed date for this FTS review.

- **Instrument Development Plan**

  Will be tabled and presented on 27th. Complete documentation will be available for IIDR.

  Contents of Dev. Plan will be:

Top level overview	Summary highlighting the important features KJK to write
Product Tree	Exists - needs to be updated and reformatted
WBS	Needs to be updated
Milestone list	Exists - to be updated
Master schedule	Exists - need updated inputs for consolidation
Deliverables chart inc. docs/designs etc.	
Constraints and risk analysis	Can be covered in overview?

That covers all needed for Feb. 27: main elements are Overiew; Milestones; Risk analysis.

Additional documents needed for the IIDR in April are:

Test reports:	Will compile what's available at the time. BMS to compile.
PA plan:	Needs updating following ESA comments. KJK to bug Dave Kelsh
Management Plan:	Needs to be updated KJK/MJG
GSE:	EGSE: Have Requirements Doc. Can provide conceptual design. Have workpackages and division of effort between instruments. Development plan needs to be produced for IIDR. MGSE: Need identified in FPU integration plan. Have notional set defined. Needs documentation. Berend needs to write it. OGSE: Reqs defined in Alignment Plan and dev. plan already covered by LAM. Need to add in AIV facility: Have Req. Doc., Cryostat spec (under

ITT). Need spec docs on others. Dev. Plan exists.

Action 7: Berend Winter to produce draft of FPU integration plan and MGSE specification for presentation at Feb. 27 meeting.

- All IIDR documentation to be out to ESA by Friday 13 April
- Pre-review of all documentation at SPIRE PT meeting on April 3rd
- So drafts needed by Friday March 30

List of Deliverable Documentation for the IIDR

Inst Des. Desc. Doc.	DG in charge Draft by 23 Feb. Mature version by March 30
IID-B	JD in charge - so activity deferred
Dev Plan/AIV Plan Also needed for Feb. 20	Verif Reqs.: Issue 1 to be sent out Feb. 13. AIV Plan: Draft by 23rd FPU Integ. Plan: BW working on it. BMS to chase up. Alignment Plan: Exists. BMS consult Kjetil about some small points. Prod. Tree: Old version to be revised. KJK plus Bruce WBS: Needs tidying up and updating. KJK Milestone lists: Needs updating. KJK Master schedule: KJK Overview doc.: Have bullet points by Feb. 26
Test Reports	KJK has asked all managers for test reports etc. Will remind them.
Product Assurance	PA plan to be updated as per comments and internal comments. Dave Kelsh
Configuration Control Plan	Dave Kelsh has drafted this. To be updated per KJK comments and then issued.
Schedule	This is part of the DP
Management Plan.	MJG has produced semi-revised version. KJK to comment by Feb. 20
GSE	KJK on EGSE BMS on other two AIV req. doc exists. Need spec doc for telescope simulator.
Software	URD exists - nothing beyond that needed for the IIDR. Next is SSD. Anna is writing it. Action: KJK to check status and what info needed to write it properly (inc. list of low-level commands etc.) Spacecraft simulator and other simulators
Technical notes	TBD

5. February 27 meeting preparation

- SPIRE attendance will be: MJG, KJK, BMS; BW
- List of topics that SPIRE will request be put on the agenda:
  - Presentations by SPIRE (draft documents to be provided)
    - Verification requirements, model philosophy and AIV plan
    - Development plan and schedule
    - Response to November Review report
    - Summary of SPIRE design/technical progress
  - IIDR : format and purpose; SPIRE plan for what we'll present and review
  - Management:
    - Revised SPIRE management of hardware and ICC

- Discussion of format and content future reviews
- Envisaged first contact with the selected prime
- Movement of PI institute to Cardiff

- IID-B status
- Spacecraft interface definition
- Information needed from ESA on various topics
- Telescope status and design (esp. wrt SPIRE stray light model)

Action 8: MJG to send above list of topics to Astrid and Thomas
Action 9: Invite Ray Carvell and someone from CNES and NASA and Otto Bauer as external representatives.

- Plan for preparation:
  - Friday 23: Send drafts of relevant documents to ESA
    - Top-level DP overview and milestone list
    - Verification Req. Doc.
    - AIV plan
    - Revised management plan
  - PT meeting on Feb. 26 at QMW to review presentations and documents.

6. ICC status

- Trevor Dimbylow will no longer be working on SPIRE due to pressure of work on other projects ICC managemetn is under review.
- In the interim Steve Guest will take over Herschel Common Science System (HCSS - formerly FCSS) work.
- Steve + KJK working on the management interface to ESA
- Seb Oliver is organising a review of the ICC URDs. The documentation will be reviewed in parallel with design work on the Use-Cases. The review of the Use-Cases will be at the end of April, after the IIDR.
- The division of workpackages amongst insitutes will then need to be defined by the ICC Steering Group

7. Next Project Team meeting date

- Monday 26 February at QMW (the day before our meeting with ESA).

8. Summary of actions from this meeting

No. PT-07-xx	Actionee	Description	Priority	Need and Date	Status
01	KJK	Check with DP what LAM's plans are for writing FPU simulator requirements relating to the MCU.	Medium	Feb.19	**Open**
02	BMS	BMS to clarify whether BDA design is compatible with IID-A requirements	High	Feb. 19	**Open**
03	MJG	Set up meeting on thermal strap and light baffle design and development programme.	High	Feb. 19	**Open**
04	KJK	Review and finalise draft Verification Requirements Document with Bruce.	High	Distribute to PMs on Friday 16 with action to agree by Feb. 20.	**Open**
05	BMS	Check status of FPU integration plan with Berend Winter.	Medium	Feb. 19	**Open**

06	BMS	Ask Dominique Pouliquen about proposed date for this FTS review.	High	Feb. 19	**Open**
07	BW	Produce draft of FPU integration plan and MGSE specification for presentation at Feb. 27 meeting.	High	Feb. 23	**Open**
08	MJG	Send above list of topics for Feb. 27 meeting to Astrid and Thomas	High	Feb. 14	**Open**
09		Invite Ray Carvell and someone from CNES and NASA and Otto Bauer as external representatives on IIDR Review Board.	Medium	Feb. 19	**Open**

Annexes

A: List of actions from previous meetings (actions still open are in RED)

B: ESA document describing IIDR format

Annex A: List of actions from previous meetings (actions still open are in RED)

No. PT-01-xx	Actionee	Description	Priority	Need and Date	Status
02	JD	Review framework and format for Instrument Design Description and clarify and revise the top-level document tree.	High	For Systems Review.	**Closed.** Doug Griffin is putting the doc together.
03	MJG	Revise and tidy up Science Requirements Document	Med	For Systems Review	**Closed.**
05	KJK	Produce revised Instrument Development Plan	High	For technical meeting Draft 30/9/00	**Superseded after Nov Review.**
06	BMS/ MJG	Draft top level criticality analysis with emphasis on impact on scientific performance; OBS and degraded modes.	Med	For Systems Review Draft 30/9/00	**Closed**
07	BMS	Request sub-system level criticality analysis for input into system level criticality analysis	High	Send request by 8/9/00	**Deferred.** Not a high priority at present. BMS to ask for it and to indicate low current priority.
08	MJG	Raise parallel mode with Albrecht Poglitsch at November FST	Low		**Open.** Was discussed at FST and Toledo.

No. PT-03-xx	Actionee	Description	Priority	Deadline	Status
11	BMS	Write requirements document for the FPU simulator.	Low	16/10/2000	**Superseded.** Jean-Louis Augueres and Christophe Cara are writing DCU part - to send draft =before end Feb.; LAM to write the MCU part.
12	CRC	Ask LAM for estimate of the date by which the decision on which BSM option is needed	High	16/10/2000	**Closed.** LAM want WE DDR before end Feb.
No. PT-04-xx	**Actionee**	**Description**	**Priority**	**Deadline**	**Status**
01	KJK	Write WE test plan	High	Dec. 20 New deadline = Feb. 20	**Updated.** BMS addressing this in the AIV plan. Will provide draft for KJK comments.
02		Write formal response to Reidinger letter	Low		**Cancelled** - superseded by further ICC management discussions.
03	KJK	Issue doc. detailing how configurable items will be dealt with after the review	High	15 Nov. 2000 New deadline = Feb. 20	**Open.** Draft exists from Dave Kelsh.

04		Revise and issue plan for ICD review	High	4 Nov. 2000	**Closed**
05	KJK	Review and comment on the SIRD	High	**Defer to Dec. 5.** New deadline = Feb. 20	**Open.** New deadline = end Feb.
No. PT-05-xx	**Actionee**	**Description**	**Priority**	**Need and Date**	**Status**
04	TGD/ KJK	Ask Paolo Saraceno for clarification on issue of level of effort available from Giovanni Bisaglia.	Low	6 Nov.	**Closed.** Answer is 50%
05	TGD	Contact Otto Bauer and Pjotr Roelfsma to get their views on ORAC DR.	Med	6 Nov.	**Closed.** ORAC DR is not being adopted as standadr.
06	MJG	Organise establishment of SPIRE web site at QMW	Low	Mid-June	**Updated.** Establish site at Cardiff.
08	BMS/ KJK	Organise BSM progress review in early December	Med	15 Nov.	**Closed** To take place Jan. 23 2001
No. PT-06-xx	**Actionee**	**Description**	**Priority**	**Need and Date**	**Status**
01	KJK	Write WE Requirements section for IRD	High	Nov. 23 Essential for Systems Review	**Closed**
02	BMS/ KJK	Organise progress review of QMW programme in second week of January (week of 8 - 12 or 15 - 19)	Medium	Dec. 15	**Closed**
03	JD	Identify what connectors needed for FPU so that this information can be fed into the CPP programme in time for the 12/13 Dec. meeting	High	Dec. 7 Revised deadline = Feb. 15	**Open.** BMS and DG will be compiling list on Thursday Feb. 15 and will circulate to SPIRE groups.
04	BMS	Ask JD to consult VH on getting equivalent circuit description of the detector and cold amplifier combination	Medium	Nov. 22	**Closed.** Discussed at JPL meeting.
05	MJG	Request TGD/SJO to send all ICC DT circulars/e-mails and other relevant documentation to Steve Lord at IPAC	Medium	Nov. 21	**Closed.** Note that Ken Ganga has replaced Steve Lord.
06	KJK	Include Steve Lord on the list of people with access to Livelink	Medium	Dec. 15	**Open.** Now Ken Ganga.
07	TGD	Produce note on the ICC Development Plan including summary of the effort available.	High	Dec. 7 (Needed for SPIRE UK cost review)	**Cancelled:** ICC management to be discussed at this meeting.

FAX

Annex B

date	12 January 2001	reference	SCI-PT-08433	page	1 / 4
from	A. Heske (SCI-PT)	extension	5467		
to	O. Bauer (MPE) C.R. Butler (TESRE) J. Charra (IAS) Th. de Graauw (SRON) M. Griffin (QMWC) K. King (RAL) N. Mandolesi (TeSRE) A. Poglitsch (MPE) J-L. Puget (IAS) K. Wafelbakker (SRON)	n°fax	Via e-mail		
copy	T. Passvogel – SCI-PT Herschel/Planck Project Team	n°fax			
subject reference	**Instrument Intermediate Design Review – Structure and Conduct**				

Dear all,

In preparation for the next formal ESA review, the Instrument Intermediate Design Review, please find enclosed the proceeding for this review. While the objectives and the deliverable documents list remain unchanged from the IID-A 1/0, I would like to draw your attention to section 3 of this memo, which defines the structure of the review.

With best regards,

Astrid Heske

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1 Introduction

The Instrument Intermediate Design Review (IIDR) for the Herschel/Planck instruments will be held at the time that the instruments freeze their design. This time marks the end of the instruments' phase B and at the same time the go-ahead for their phase C/D.

Given the importance of the IIDR – for the reasons above – this note summarises the structure and conduct of the IIDR including the objectives and deliverable documents.

2 Objectives

The objectives are given in the IID-A (1/0, 01/09/00, SCI-PT-IIDA-04624) and remain unchanged:

The IIDR shall be conducted at the time of Prime Contractor selection.
The objectives of the review shall be to demonstrate that:

- the instrument detailed system design has been finalised
- the instrument subsystem design has been finalised
- the detailed interface requirements have been finalised
- the design for the on-board software has been finalised (User Requirements Document)
- the design of the necessary MGSE, EGSE and OGSE has been finalised.

3 Structure

The IIDR will consist of two parts:

1. Review of deliverable documentation (data package)
2. Meeting - Presentations and Discussions

The data package shall be delivered well in advance – nominally four weeks - prior to the meeting.

During the review of the documentation, a list of points to be clarified and discussed will be generated by the review board and forwarded to the instrument team.

The meeting shall consist of a number of short presentations of the areas listed below, which should

- highlight the particular progress made
- present the critical areas
- identify the steps to resolve (potential) problems
- take into account the points raised by the review board.

Presentations on the following areas shall be given:

- Instrument design description and expected performance
- Instrument design and development
- Budgets and Interfaces
- Management and Schedule
- AIV and Model Philosophy
- Product Assurance
- Instrument Sub Systems and their Interfaces
- Instrument (On-Board) software
- Ground Support Equipment and Facilities

4 Deliverable Documentation

A data package shall be provided for the IIDR. The package shall be delivered to the ESA Project Team in electronic form (PDF-file).

The packages shall contain the following information to the appropriate level (system, subsystem, unit) as required by the objective of the review and shall be adapted to each specific review. In order to avoid duplication of effort, the project is prepared to discuss and accept on a case by case basis different ways to provide the required information, i.e. either in a selfstanding document package (preferred way) or distributed among instrument generated documents and technical notes with a guide identifying the location of the information.

Instrument Description Document:

- A description of the current instrument design, its expected performance and interfaces

Instrument Interface Document(s):

- The IID-B updated to the current status

Development Plan/AIV:

- A new/critical technologies demonstration plan
- The Instrument Development and Verification plan
- Integration Plan and Procedures

Test reports:

- Test reports of environmental and functional tests, which demonstrate that the objectives of the instrument development, scheduled for the time of the review, have been met

Product Assurance:

- Product Assurance documentation as required in the Product Assurance Requirements for the FIRST/Planck instruments

Schedule:

- Schedule network and bar-chart together with an assessment of progress and problem areas covering all aspects of the instrument and associated equipment

Management:

- Management Plan

Ground Support Equipment:

- Electrical ground support equipment, design, development and verification status including both hardware and software
- Mechanical ground support equipment, design, development and verification status
- Optical ground support equipment, design, development and verification status.

Software:

- Onboard software (OBSW) – URD, SRD, ADD, DDD
- GSE's, e.g. s/c simulator

Technical Notes:

- Technical notes, covering any topic or analysis which is either required by the IID or has been requested by the ESA Project Team

5 Board Composition

The board will consist of:

- Chairman
- Co-Chairman (Project Scientist)
- Secretary
- Board Members covering the following areas (4 - 6 people):
  - Product Assurance
  - AIV
  - Electrical
  - Thermal/Cryo
  - Mechanical
  - Data Management
  - On-board software
  - Ground Support Equipment
- Representative of the national funding agency (if proposed by the instrument team)

In addition, during the documentation review or for the review meeting, experts may be called upon. After mutual Instrument and ESA agreement, third parties may be invited to the review as observers.