

SPIRE IBDR Preparation Plan and Draft Agenda

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1. Introduction

The SPIRE Instrument Baseline Design Review (IBDR) meeting will be held on March 5, 6 2002. The venue will be RAL. This is a formal review in front of an ESA-appointed Review Board, and is an important milestone in the instrument development. This note outlines the scope and format of the review, and the Project Team's plan for IBDR preparation. It is based on the requirements for the IBDRs in general as defined by ESA, and additional considerations based on the particular needs and current status of SPIRE.

2. IBDR objectives

2.1 ESA-defined objectives

The objectives of the Herschel/Planck IBDRs (as defined by ESA in consultation with the instrument teams) are to demonstrate:

- (i) that the system and sub-system designs have been completed and are under configuration control and interfaces between subsystems are frozen;
- (ii) that the interface requirements with the spacecraft have been consolidated and are under configuration control;
- (iii) that the On-Board Software requirements and the architectural design are complete and interfaces have been frozen;
- (iv) the readiness of the AVM/CQM/PFM programmes, including manufacturing and AIT/AIV;
- (v) the readiness of the Ground Support Equipment (GSE) programme.

2.2 Additional SPIRE objectives

The SPIRE IBDR will follow on from the sequence of subsystem DDRs that will be completed by the end of this year. In the review we will report on the DDRs and present the status of the subsystems, and also focus on the instrument system design with particular attention on the following:

- (i) FPU thermal behaviour and modelling;
- (ii) EMC;
- (iii) Failure mode analysis and redundancy;
- (iv) FPU mechanical analysis;
- (v) Instrument AIV plan.

2.3 Constraints

A comprehensive package of review documentation must be sent out in early February, and must therefore be reviewed internally by mid-January. This means that most of the documents must actually be produced in near final form by the end of the year - a week before Christmas. The review will therefore be of the status of the project at that time, not on the date of the IBDR meeting itself. Any significant updates will be highlighted on the day.

The finalisation of the documentation also coincides with several SPIRE DDRs, which will require substantial support from the Project Team. It may therefore be necessary to prioritise the production of the review documents, and it cannot be guaranteed that all of the requested documents will be available in fully mature form. We will consult with ESA on the priorities.

3. Review Board composition

The IBDR Review Board will consist of

- Jerry Crone ESA Payload Manager (Chairman)
- Göran Pilbratt ESA Project Scientist (Co-Chairman)
- Jean Bruston ESA Instrument System Engineer (Secretary)
- ESA-appointed members covering the following areas:
 - Product Assurance
 - AIV/Ground Support Equipment
 - Electrical/Thermal-Cryo/Mechanical
 - Data Management /On-board software
- Industry Representative
- Representatives of national funding agencies and/or independent scientific experts (if proposed by the instrument team). SPIRE will invite Otto Bauer and possibly one other independent member.

By mutual Instrument and ESA agreement, other parties may be invited to the review as observers.

4. IBDR format

The review will consist of two parts:

- (i) review of the documentation package;
- (ii) a review meeting involving presentations, discussion, Review Board meeting, and feedback

ESA require that the documentation and presentations make clear the following:

- (A) the status of the instrument baseline and performance;
- (B) progress made since the IIDR (held in April 2001), including the implementation of recommendations from that review;
- (C) open issues and critical areas;
- (D) plans for proceeding and resolving problems.

In order to meet these objectives, two full days will be required for the review meeting.

The documentation package must be delivered four weeks before the meeting (because of difficulties caused by the late distribution of documents for previous reviews, ESA are rightly insistent on this point).

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 before the review meeting.

4.1 Guidelines for presentations

1. At the review meeting, most of the presentations will be by Project Team members (see the draft agenda below). Short presentations will also be given on the status of the subsystems. We can assume that the Review Board and the audience are familiar with the instrument system and subsystem designs as presented at the System Design Review in November 2000, at the IIDR in April 2001, and in the substantial IBDR documentation package. The emphasis will be on using the presentations to emphasise key issues and assist the Review Board in concentrating on the four aspects highlighted by ESA - these are to be explicitly addressed in the presentations by adopting a format which includes the following headings:

- (A) Status of the instrument/subsystem design and performance;
- (B) Progress since the IIDR;
- (C) Open issues and critical areas;
- (D) Plans for proceeding and resolving problems;

The short subsystem presentations should provide this information based on

- the DDRs and resulting follow-up;
- status of ICDs.

There is no need to describe the design, except to highlight any key updates or changes.

2. All presentations should take at least 5 minutes less than the allotted time to allow for questions and change-over.
3. All presentations are to be in Powerpoint or PDF form, and must be made available to Eric Sawyer before the review meeting for installation on one machine.
4. The review meeting shall also be chaired by the Review Board chairman. The session chairs shall be responsible for ensuring that speakers keep within the allotted time.

5. List of documents to be issued for the review

The table below lists the documents that will be provided for the review. The ones highlighted in blue are those that we consider to be essential for the Review Board. Others are there for information or for the benefit of technical specialists participating in the review who will need to look at some aspects in more detail. Most of the documents are to be written by members of the Project Team. Subsystem-level documentation will be available in the form of the DDR documentation packages (updated as appropriate).

P1: Top priority, essential for the IBDR, not produced as yet - to be in good shape before Christmas and final review by mid. January

P2: Second priority - not to be forgotten and ready by mid. January

P3: Third priority for now (already exists, inessential, or requirements as yet unclear)

No. and Priority	Document	Responsible	Current Status	Plan
Top-level requirements documents				
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.
3 P1	Calibration Requirements Document	Bruce + Matt	Being written.	Part complete, Draft by 20 Dec Finalise by: Jan. 18
Instrument Design Description and Development Plan				
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
5 P1	Instrument Development Plan	Ken/Eric	To be updated. Will be in the same format as for the IIDR.	Review by: Jan. 18
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. 18

IID-B and related documents

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.
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.
9 P1	FPU Mechanical Model	Berend	To be produced	Will be produced by MSSL 18 Jan
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 to be defined.
11 P2	Stray light model	Tony R.	To be updated. Inputs expected from ASEF. Input needed from ASSED (but not expected).	Use existing model/report do not wait for updates from ASEF and ASSED.
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.
13 P2	Optical error budget	Kjetil	New version exists	To be reviewed by Bruce. Finalise by Jan 18.

On-Board Software

14 P1	OBS URD	Anna	Exists. Won't be updated.	There will be unclosed change requests.
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.
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
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
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.
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 ECS to chase Dave.
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
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

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 Top level only will be done for IBDR documentation, further progress before March, consider extra effort from outside the system team e.g. contractor.
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.
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.
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
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: Dec. 20
32 P1	Configured Items Data List	Eric Clark	List of all configured documents.	Finalise: Dec. 10
33 P3	Critical Items List		Need clarification from ESA	Out put from FMECA
34 P3	Change Requests and Waivers List	Eric Clarke	Exists - just needs to be printed out.	Finalise: Jan. 15
Additional Documentation to be available for the Panel				
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.

6. IBDR Preparation Plan

1. All aspects of the preparation for the review will be managed and coordinated by Eric Sawyer.
2. All documents are to be reviewed internally by the Project Team before finalisation, under Eric Sawyer's direction. The deadline for document distribution to ESA is Monday February 4. To allow for proper internal review, all documents must therefore be ready by mid-January at the latest.

Taking the Christmas vacation into account, and allowing for some margin, this means that the goal is to have nearly all of the documents in final form by the middle of January.

3. Progress on the preview preparation will be rigorously tracked in the fortnightly Project Team meetings (meetings are scheduled for Dec. 10 and 19).
4. Considering the large file sizes that will certainly be included in the documentation package, distribution to the Review Board will be by CD. The documentation shall also be placed on Livelink.

7. Draft Agenda for the review meeting

The draft agenda are given below (the agenda may be updated but the version below should be fairly accurate).

SPIRE IBDR RAL, 5, 6 March 2002 Draft Agenda

Day 1 5 March

Start Time	End Time	Duration (Min.)		
			Introduction	Chair: King
9:30	9:35	5	Welcome and logistics	M. Griffin
9:35	9:45	10	Purpose and organisation of the review	Sawyer
9:45	9:55	10	Review Board perspective	Board Chair
9:55	10:10	15	Coffee	
10:10	10:50	40	Instrument design, performance, operating modes	M. Griffin
			SPIRE System Design	Chair: Sawyer
10:50	11:20	30	Instrument system design	Swinyard
11:20	11:35	15	Optical and opto-mechanical design	Swinyard
11:35	11:55	20	Electrical design, harness, grounding scheme	Delderfield
11:55	12:15	20	Instrument budgets	D. Griffin
12:15	12:35	20	Status of IID-B and Herschel interfaces	Delderfield
12:35	12:50	15	FPU Mechanical Model	Winter
12:50	14:00	70	Lunch	
14:00	14:20	20	EMC Control Plan	D. Griffin
14:20	14:40	20	Thermal design and modelling	Heys
14:40	15:00	20	Thermal performance and observing modes	Griffin
15:00	15:15	15	Coffee	
15:15	15:45	30	FMECA, FDIR, and Worst Case Analysis	Swinyard
			Instrument Development Plan	Chair: Griffin
15:45	16:00	15	Management Plan	King
16:00	16:40	40	Development Plan and schedule	Sawyer
16:40	17:10	30	Qualification and AIV Plan	Swinyard
17:10	17:30	20	Questions and clarifications	
17:30	18:30	60	Review Board Meeting	
Evening			Relaxing social event	

Start Time	End Time	Duration (Min.)		
			AIV and PA	Chair: Sawyer
9:00	9:30	30	Qualification and AIV Plan	Swinyard
9:30	9:45	15	AIV Facility and Ground Calibraion	Smith
9:45	10:00	15	Coffee	
10:00	10:15	15	EGSE	King
10:15	10:30	15	MGSE and OGSE	Swinyard
10:30	10:45	15	PA procedures and status	Clarke
10:45	11:05	20	Questions and clarifications	
			Major Subsystems and their interfaces	Chair: Swinyard
11:05	11:20	15	Detectors	Bock
11:20	11:35	15	FPU structure and thermal straps	Winter
11:35	11:50	15	FTS	Pouliquen
11:50	12:05	15	BSM	Pain
12:05	12:20	15	He-3 cooler	Duband
12:20	12:35	15	Internal calibrators	Hargrave
12:35	13:00	25	DCU and FCU	Cara
13:00	14:15	75	Lunch	Davis
14:15	14:30	15	Shutter	
14:30	14:45	15	DPU	Cerrulli
14:45	15:00	15	On-Board Software	Di Giorgio
15:00	15:15	15	Instrument commanding and H/W-S/W Interaction	King
15:15	15:30	15	Coffee	
			Summary and Review Board meeting	Chair: Sawyer
15:30	16:00	30	Summary of progress on issues raised at the IIDR	Griffin
16:00	16:30	30	Questions and clarifications	
16:30	17:30	60	Review Board meeting	
17:30	17:45	15	Review Board feedback	
17:45			End of meeting	