

# **SPIRE Instrument Hardware Design Review (IHDR) Review Preparation Plan and Draft Agenda**

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## **1. Introduction**

The SPIRE Instrument Hardware Design Review (IHDR) will be held at RAL on July 9 and 10. 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 IHDRs in general as defined by ESA, and additional considerations based on the particular needs and current status of SPIRE.

## **2. IBDR objectives**

The Herschel/Planck instrument IHDRs are notionally scheduled for the time that the instrument level test programmes are about to start and first test results of the first instruments' subsystem and unit models are available. Important objectives of the IHDR are to confirm the AVM and CQM AIT programmes at instrument and system level and to confirm the development approach for the instrument FM programme.

### **2.1 ESA-defined objectives**

The objectives of the Herschel/Planck IHDRs as defined by ESA are:

- (i) assessment of the instrument AVM/CQM programme status
- (ii) definition of the acceptance criteria of the AVM/CQM models for spacecraft system level
- (iii) acceptance and freeze of the on-board software (Architectural Design Document)
- (iv) review of the ground facilities (h/w and s/w) required to support the ILTs

Particular emphasis will be given to the OBSW development status and required maturity.

### **2.2 Additional SPIRE objectives**

The SPIRE IHDR will occur during the SPIRE STM/CQM programme, which is a very busy period for the Project Team. The review shall therefore be based on existing documentation to the maximum extent possible. In addition to the ESA objectives as outlined above, the review will also focus on the instrument status with particular attention on the following:

- (i) subsystem technical status, with emphasis on test reports;
- (ii) STM test results to date;
- (iii) spacecraft interfaces, especially FPU thermal interfaces;
- (iv) instrument AIV plan and schedule;
- (v) configuration status.

### **2.3 Constraints**

This review will take place in the middle of a very active time for the project team, with the STM/CQM AIV programme under way at RAL. The Project Team's priority will be to carry out that programme as effectively as possible, so it will be important to minimise the amount of additional work required for the review. The review preparation will therefore need to be prioritised to ensure that it concentrates on the key issues and does not detract from AIV work in progress.

The review documentation package will be sent out one month before the review meeting (deadline 9 June). This means that most of the documents must actually be produced in near final form by the end of May. The documentation will therefore reflect the status of the project at that time. Any relevant updates will be made during the review meeting.

### 3. Review 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

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.

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

- (A) status of the hardware and software development and performance, including test results and analyses;
- (B) progress made since IBDR (March 2002), including the status of implementation of recommendations;
- (C) 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.

### 4. Review Board composition

The IBDR Review Board will consist of

Gerry Crone	ESA Payload Manager (Chairman)
Göran Pilbratt	ESA Project Scientist
Carsten Scharmberg	ESA SPIRE Instrument System Engineer (Secretary)
ESA-appointed members:	
Jan Rautakosky -	Product Assurance
Oswaldo Piersanti -	AIV/Ground Support Equipment
Martin Linder	Thermal
Thijs van der Laan	Mechanical:
Frank de Bruin	Data Handling/On-board software:
Pierre Estaria	Ground Segment:
Alcatel Representative:	Bernard Collaudin
Astrium Representative:	Horst Faas
PACS Representative:	Otto Bauer
Representatives of national funding agencies	- PPARC - Ray Carvell
	- CNES - Yvan Blanc or alternate
	- NASA - Fred O'Callahan

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

#### 4.1 Guidelines for presentations

We can assume that the Review Board and the audience will be familiar with the instrument system and subsystem designs as presented at a number of previous reviews and described in the documentation package. The emphasis will be on using the presentations to emphasise key issues and assist the Review Board in concentrating on the important aspects mentioned above.

**Presentations by the Project team** will focus on

- updates to the instrument system design and major interfaces;
- the Instrument Development Plan and Schedule;
- PA and configuration control;
- the current status of the STM/CQM programme.

Presentations will also be given on the status of the **subsystems** - the key issues are to be explicitly addressed in these presentations by adopting a format which includes the following headings:

- (A) Compliance with requirements (IRD) and budgets
- (B) Subsystem qualification status
- (C) Results of performance tests and modeling
- (D) Development plan and delivery schedule (esp. CQM and PFM)
- (E) PA and configuration status
- (F) Problems and plans for resolving them

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

1. All presentations should take at least 5 minutes less than the allotted time to allow for questions and change-over.
2. 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.
3. 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.

A standard viewgraph template will be provided for presenters to use.

## **5. List of documents to be issued for the review**

The list of documents has been transferred to SPIRE IHDR Guide to documentation, (SPIRE-RAL-NOT-001678)

## **6. Preparation for the review**

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 June 9. To allow for proper internal review, all documents must therefore be ready by May 26 at the latest.
3. 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 first draft agenda are given below.

**SPIRE Instrument Hardware Design Review (IHDR)  
RAL, 9/10 July 2002**

**Draft Agenda**

**Day 1 9 July**

<b>Start Time</b>	<b>End Time</b>	<b>Duration (Min.)</b>		
			<b>Introduction</b>	<b>Chair: King</b>
09:30	09:35	5	Welcome and logistics	M. Griffin
09:35	09:50	15	Purpose and organisation of the review	Sawyer
09:50	10:00	10	Review Board perspective	Board Chair
10:00	10:15	15	Coffee	
10:15	10:35	20	Instrument design and performance update	M. Griffin
			<b>SPIRE System Design Update</b>	<b>Chair: Sawyer</b>
10:35	10:50	15	Instrument budgets	D. Griffin
10:50	11:05	15	Status of IID-B and Herschel interfaces	Delderfield
11:05	11:20	15	Grounding scheme and harness design	Delderfield
11:20	11:40	20	FPU FEA model and subsystem vibration levels	Winter
11:40	12:00	20	Thermal design and modelling	Goizel
12:00	12:15	15	EMC Control Plan	D. Griffin
12:15	12:45	30	Questions and clarifications	Swinyard
12:45	13:45	60	Lunch	
13:45	14:15	30	Tour of AIV facility	
			<b>Subsystem Status Reports</b>	<b>Chair: Sawyer</b>
14:15	14:45	30	Detector Arrays and JFETs	Bock
14:45	15:05	20	FPU structure and thermal straps	Winter
15:05	15:20	15	Coffee	
15:20	15:30	10	Mirrors	Pouliquen
15:30	15:50	20	FTS mechanism	Pouliquen
15:50	16:10	20	BSM	Parr Burham
16:10	16:30	20	He-3 cooler	Duband
16:30	16:50	20	Internal calibrators	Hargrave
16:50	17:00	10	Filters	Hargrave
17:00	17:20	20	DRCU	Cara
17:20	17:40	20	DPU	Cerrulli
17:40	18:00	20	On-Board Software	Molinari
18:00	18:30	30	Interim Review Board meeting	
<b>Evening</b>			<b>Relaxing social event</b>	

**Day 2 10 July**

<b>Start Time</b>	<b>End Time</b>	<b>Duration (Min.)</b>		
			<b>AIV and PA</b>	<b>Chair: Sawyer</b>
<b>9:00</b>	<b>9:30</b>	<b>30</b>	<b>AIV Facility and Ground Calibration</b>	<b>Smith</b>
<b>9:30</b>	<b>9:45</b>	<b>15</b>	<b>EGSE</b>	<b>King</b>
<b>9:45</b>	<b>10:00</b>	<b>15</b>	<b>MGSE and OGSE</b>	<b>Swinyard</b>
<b>10:00</b>	<b>10:15</b>	<b>15</b>	<b>Coffee</b>	
<b>10:15</b>	<b>10:45</b>	<b>30</b>	<b>PA procedures and status</b>	<b>Clark</b>
<b>10:45</b>	<b>11:15</b>	<b>30</b>	<b>FMECA, H/W-S/W analysis and FDIR</b>	<b>Swinyard</b>
<b>11:15</b>	<b>11:45</b>	<b>30</b>	<b>Questions and clarifications</b>	
			<b>Instrument Development Plan</b>	<b>Chair: Griffin</b>
<b>11:45</b>	<b>12:00</b>	<b>15</b>	<b>Qualification and AIV Plan</b>	<b>Swinyard</b>
<b>12:00</b>	<b>12:15</b>	<b>15</b>	<b>Development Plan and Model Philosophy</b>	<b>Sawyer</b>
<b>12:15</b>	<b>12:30</b>	<b>15</b>	<b>STM/CQM progress report</b>	<b>Sawyer</b>
<b>12:30</b>	<b>12:50</b>	<b>20</b>	<b>Shedule (CQM, PFM, FS)</b>	<b>Sawyer</b>
<b>12:50</b>	<b>13:00</b>	<b>10</b>	<b>Project Team staffing and organisation</b>	<b>King</b>
<b>13:00</b>	<b>14:00</b>	<b>60</b>	<b>Lunch</b>	
			<b>Summary and Review Board meeting</b>	<b>Chair: Swinyard</b>
<b>14:00</b>	<b>14:20</b>	<b>20</b>	<b>Critical Items List</b>	<b>Sawyer</b>
<b>14:20</b>	<b>14:35</b>	<b>15</b>	<b>Summary of progress on issues raised at the IBDR</b>	<b>M. Griffin</b>
<b>14:35</b>	<b>15:15</b>	<b>40</b>	<b>Questions and clarifications</b>	
<b>15:15</b>	<b>15:30</b>	<b>15</b>	<b>Coffee</b>	
<b>15:30</b>	<b>16:30</b>	<b>60</b>	<b>Review Board meeting</b>	
<b>16:30</b>	<b>16:45</b>	<b>15</b>	<b>Review Board feedback</b>	
<b>16:45</b>			<b>End of meeting</b>	