



# Science Verification Reviews - recap



- Overall objective to ensure adequate scientific performance – ‘meeting expectations’
- Secondary objective is to provide the best possible assessment of actual performance ‘at the time’ – e.g. for the issue of AO
- To cover:
  - science instrument performance
  - telescope performance
  - spacecraft performance directly relating to scientific performance
  - ‘integrated’ (observatory) science performance
- Three phases foreseen for science instrument SVRs

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# Science instrument SVRs - summary



- **SVR phase 1 – ‘CQM ILT/EQM & FM ILT preps’ review**
  - plan adequate FM ILT
  - SPIRE: Jan 2006, HIFI: Apr 2006, PACS: Jun 2006
- **SVR phase 2 – ‘FM ILT pre-completion’ review**
  - ensure FM ILT complete
  - SPIRE: Sep 2006, HIFI: Dec 2006 + $\Delta$ s, PACS: Jan 2007
- **SVR phase 3 – ‘instrument science performance’ review**
  - feed into/combined with IFAR
  - assess/confirm science performance as announced/expected
  - SPIRE: Oct 2007, PACS: Nov 2007, HIFI: TBD 2008
- **All phases – provide best current science performance assessment**
  - SVR-2 fed into the KP GT AO, KP OT AO updated

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# Science instrument SVR phase 3: originally 'instrument science performance' review

- **take stock of fully assessed results from FM ILT**
  - all requirements met?
- **take stock of instrument verification at 'module' and 'satellite' level – now plans for**
  - still expect pre-delivery performance?
- **perform best possible assessment of in flight performance before flight**
- **generate the required instrument input for feeding into higher level Herschel SVRs and inflight plans**
- **timeframe after proper digestion of FM ILT and module/satellite verification results – TBC 2007**
- **feeding into IFAR**
  - IST results will be added for IFAR
  - IFAR feeds into FAR -> shipment to launch

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# Detailed procedures



- Detailed procedure for each review to be agreed between ESA and the PI

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# SPIRE SVR phase 3: detailed procedure



## Review Format

- formal ESA review – but format is **‘working review’** to aid ongoing effort
  - no ‘RIDs’, but Board will provide recommendations & actions
- a review of the documentation package
- a review meeting involving presentations, discussion, review Board meeting, and initial feedback
- potential additional SPIRE objectives

## Review Meeting

- this meeting, Stockholm Observatory, 29-30 Oct 2007

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# SPIRE SVR phase 3:

## detailed procedure



### Review Board composition

- Göran Pilbratt (Chair) – ESA Herschel Project Scientist
- Gerry Crone – ESA Herschel Payload Manager
- Carsten Scharmberg – ESA Herschel Instrument Manager (observer)
- Sarah Leeks – ESA Herschel Instrument and Calibration Scientist
- Ivan Valtchanaov – ESA Herschel Instrument and Calibration Scientist (observer)
- Helmut Feuchtgruber – PACS ILT expert
- Paul Harvey – Herschel Mission Scientist
- Ray Carwell – PPARC representative
- Karine Mercier – CNES representative
- Ulf Israelsson – NASA representative
- Matt Griffin – SPIRE Principal Investigator (observer)

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# SPIRE SVR phase 3: detailed procedure



## Review Guidelines

Be as brief and concise as possible, while highlighting:

- **analyses** that relate to **scientific performance**
- **results** and their **implications** rather than detailed accounts of the data taking, reduction and analysis
- **compliance** with explicit system and subsystem requirements (as detailed in the Instrument Requirements Document and the subsystem specification documents)
- **shortcomings/incomplete aspects** of the currently available data and needs for additional tests, characterisation, and calibrations
- a list of identified **concerns/problems**

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# SPIRE SVR phase 3:



## detailed procedure – document package

Documents

File Edit View Favorites Tools Help

Back Forward Up Search Folders

Address C:\Documents and Settings\goran pilbratt\My Documents\FIRST\Payload\SVRs\SPIRE\_SVR3\Documents Go

**File and Folder Tasks**

- Make a new folder
- Publish this folder to the Web
- Share this folder

**Other Places**

- SPIRE\_SVR3
- My Documents
- My Computer
- My Network Places

**Details**

| Name  | Size     | Type                       | Date Modified    |
|---|----------|----------------------------|------------------|
| SVR-3_0_Procedure_v30_SPIREphase3.pdf                           | 884 KB   | Adobe Acrobat 7.0 Document | 16/10/2007 11:41 |
| SVR-3_1_SVR-3_and_Cons_Meeting_Plan_Final.pdf                   | 756 KB   | Adobe Acrobat 7.0 Document | 21/10/2007 21:33 |
| SVR-3_2_Response_to_SVR-2_Board_Recommendations.pdf             | 34 KB    | Adobe Acrobat 7.0 Document | 18/10/2007 08:24 |
| SVR-3_3_Science_Requirements_Document_v3_000064.pdf             | 41 KB    | Adobe Acrobat 7.0 Document | 19/09/2006 14:44 |
| SVR-3_4_IRD_Issue_1_3_first_release_000034.pdf                  | 642 KB   | Adobe Acrobat 7.0 Document | 19/09/2006 14:44 |
| SVR-3_5_SPIRE_Calibration_Requirements_Document_v1-1_001064.pdf | 158 KB   | Adobe Acrobat 7.0 Document | 19/09/2006 14:44 |
| SVR-3_6_FM_Calibration_and_Performance_Test_Plan_0-2.pdf        | 328 KB   | Adobe Acrobat 7.0 Document | 19/09/2006 14:44 |
| SVR-3_7_Thermal_Design_Requirements_002075.pdf                  | 881 KB   | Adobe Acrobat 7.0 Document | 19/09/2006 14:44 |
| SVR-3_8_Thermal_Performances - Issue 3.pdf                      | 253 KB   | Adobe Acrobat 7.0 Document | 19/10/2007 20:01 |
| SVR-3_9_Instrument_throughput.pdf                               | 214 KB   | Adobe Acrobat 7.0 Document | 19/10/2007 19:58 |
| SVR-3_10_BSM_Performance_v2.pdf                                 | 130 KB   | Adobe Acrobat 7.0 Document | 19/09/2006 14:44 |
| SVR-3_11_SMEC_and_Spectrometer_Performance.pdf                  | 1,089 KB | Adobe Acrobat 7.0 Document | 19/10/2007 22:06 |
| SVR-3_12_PCa_Performance.pdf                                    | 508 KB   | Adobe Acrobat 7.0 Document | 19/10/2007 19:46 |
| SVR-3_13_SCa_Performance.pdf                                    | 631 KB   | Adobe Acrobat 7.0 Document | 19/10/2007 19:52 |
| SVR-3_15_Bolometer_Array_Noise_Performance.pdf                  | 1,361 KB | Adobe Acrobat 7.0 Document | 20/10/2007 19:07 |
| SVR-3_17_SPIRE_Optical_Performance.pdf                          | 1,407 KB | Adobe Acrobat 7.0 Document | 04/10/2007 10:35 |
| SVR-3_18 EMC_DRB_Summary.pdf                                    | 74 KB    | Adobe Acrobat 7.0 Document | 26/10/2007 13:56 |
| SVR-3_19_Microvibration_Report.pdf                              | 651 KB   | Adobe Acrobat 7.0 Document | 26/10/2007 13:56 |
| SVR-3_20_CQM1_Performance_Test_Report_RP_002083.pdf             | 1,301 KB | Adobe Acrobat 7.0 Document | 28/09/2007 10:47 |
| SVR-3_21_SPIRE_EQM_Straylight_Report.pdf                        | 251 KB   | Adobe Acrobat 7.0 Document | 17/10/2007 15:31 |
| SVR-3_22_STM2_Straylight_report_REP-002799iss1.pdf              | 999 KB   | Adobe Acrobat 7.0 Document | 12/01/2007 12:59 |
| SVR-3_23_Draft_SPIRE_ILT_AOT_Test_Report(Issue 1.0).pdf         | 340 KB   | Adobe Acrobat 7.0 Document | 28/09/2007 10:13 |
| SVR-3_24_IID_Verification_Matrix_002874iss 1.0.pdf              | 158 KB   | Adobe Acrobat 7.0 Document | 28/09/2007 10:47 |
| SVR-3_25_Photometer_Pipeline.pdf                                | 347 KB   | Adobe Acrobat 7.0 Document | 17/10/2007 16:19 |
| SVR-3_26_Spectrometer_Ppipeline.pdf                             | 996 KB   | Adobe Acrobat 7.0 Document | 19/10/2007 22:06 |
| SVR-3_27_SPIRE_Pipeline_Description.pdf                         | 1,661 KB | Adobe Acrobat 7.0 Document | 19/10/2007 21:51 |
| SVR-3_29_System_Level_Test_Plan-002726v1_1.pdf                  | 43 KB    | Adobe Acrobat 7.0 Document | 28/09/2007 10:47 |
| SVR-3_30 EMC_Test_Plan_Overview.pdf                             | 38 KB    | Adobe Acrobat 7.0 Document | 26/10/2007 13:56 |
| SVR-3_31_SPIRE_Calibration_Observation_Definitions.pdf          | 202 KB   | Adobe Acrobat 7.0 Document | 19/10/2007 21:58 |
| SVR-3_33_SPIRE_PV_Phase_Plan.pdf                                | 357 KB   | Adobe Acrobat 7.0 Document | 19/10/2007 22:08 |
| SVR-3_34_SPIRE_Sensitivity_Models_May_21_2007.pdf               | 1,005 KB | Adobe Acrobat 7.0 Document | 20/05/2007 22:42 |

# SPIRE SVR phase 3: detailed procedure



## Review Guidelines – cont'd

For the presentations in particular:

- assume that the Review Board will be familiar with the instrument system and subsystem designs as presented at a number of previous reviews
- **emphasise key issues** from the documentation and assist the Review Board in concentrating on the important aspects mentioned above
- **focus on key conclusions** from tests that have a direct bearing on instrument scientific performance;
- present **compliance** with explicit system and subsystem requirements
- describe **lessons learned** and **implications for future test campaigns** at satellite levels and in-orbit commissioning and performance verification

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# SPIRE SVR phase 3: detailed procedure - presentations

Day 1: 29 October

| Start Time | End Time | Duration (Min.) |   |                 |
|------------|----------|-----------------|---|-----------------|
| 14:00      | 14:05    | 5               | Welcome and logistics                         | Olofsson        |
|            |          |                 | Purpose and organisation of the review        |                 |
| 14:05      | 14:15    | 10              | ESA and Review Board Perspective              | Pilbratt        |
| 14:15      | 14:20    | 5               | SPIRE perspective                             | M Griffin       |
|            |          |                 | Review of ILT results                         |                 |
| 14:20      | 14:40    | 20              | Overview of the SPIRE ILT Programme           | Swinyard        |
| 14:40      | 15:00    | 20              | Thermal performance                           | TBD             |
| 15:00      | 15:15    | 15              | Coffee  |                 |
| 15:15      | 15:35    | 20              | Spectral passbands and throughput             | Swinyard        |
| 15:35      | 15:50    | 15              | BSM performance                               | Lim             |
| 15:50      | 16:10    | 20              | SMEC and spectrometer performance             | Baluteau/Fulton |
| 16:10      | 16:25    | 15              | Optical performance                           | Ferlet          |
| 16:25      | 16:55    | 30              | Bolometer Array Performance                   | TBD (JPL)       |
| 16:55      | 17:10    | 15              | PCAL and SCAL performance                     | Hargrave        |
| 17:10      | 17:30    | 20              | EMC Tests: Status, Programme and Plan         | D Griffin       |
| 17:30      | 17:45    | 15              | AOT Tests: FM report and FS plan              | King            |
|            |          |                 | Instrument Compliance and Performance         |                 |
| 17:45      | 18:00    | 15              | Compliance with Inst. Req. Doc.               | Swinyard        |
| 18:00      | 18:15    | 15              | Sensitivity Models                            | M Griffin       |
| 18:15      | 18:30    | 15              | AOT Implementation and Spacecraft Performance | Leeks/Pilbratt  |
| 18:30      | 19:00    | 30              | Preliminary Review Board meeting              |                 |
|            |          |                 | Evening: Relaxing social event                |                 |



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# SPIRE SVR phase 3: detailed procedure – presentations cont'd



## Day 2: 30 October

### Data Processing Pipelines

|       |       |    |                             |              |
|-------|-------|----|-----------------------------|--------------|
| 09:00 | 09:20 | 20 | Photometer Pipeline Status  | Griffin      |
| 09:20 | 09:40 | 20 | FTS Pipeline Status         | Fulton       |
| 09:40 | 10:00 | 20 | Status of Calibration Files | Lim/Hargrave |

### Future Plans

|       |       |    |   |              |
|-------|-------|----|---|--------------|
| 09:40 | 10:10 | 30 | System-Level Test Plan                            | D Griffin    |
| 10:10 | 10:25 | 15 | Coffee  |              |
| 10:25 | 10:45 | 20 | Inst. Commissioning Plan (inc. 10 min discussion) | Swinyard     |
| 10:45 | 11:25 | 40 | PV-Phase Test Plan (inc. 15 min. discussion)      | Lim/Hargrave |
| 11:25 | 12:05 | 40 | Calibration Plan (inc. 15 min. discussion)        | Lim/Hargrave |

### Summary and conclusions

|       |       |    |  |           |
|-------|-------|----|--|-----------|
| 12:05 | 12:20 | 15 | Progress with respect to SVR-2 recommendations | M Griffin |
| 12:20 | 12:40 | 20 | Problem areas and conclusions                  | M Griffin |
| 12:40 | 13:00 | 20 | Discussion                                     |           |
| 13:00 | 14:00 | 60 | Lunch  |           |

PM

### In Parallel

- Review Board meeting
- SAG Splinters

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