EADS astrium

Test Procedure

Herschel

Title: **IST Instrument Commissioning**
SPIRE FM Cold Functional Test

CI-No: 125200

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Distribution: See Distribution List (last page)

Issue	Date	Sheet	Description of Change	Release
1	08.05.08	All	First Formal Issue	
1.1	30.05.08	All	Updates to reflect redlining from 1st SMEC test in Hel plus addition of LL latch relay status check for nominal and redundant. Minor typos + replacement of outstanding S/C level TBCs/TBDs	
1.2	01.07.08		Typo in I-EGSE connection cmd removed (**YC00X966)** **Update of power on/off details for CFT**	
1.3	03.07.08		Implementation of new issue (2.5) of RD2, SPIRE Cold Functional Test Procedures, SPIRE-RAL-PRC-2398	
1.4	23.07.08		Implementation of new issue (2.6) of RD2, SPIRE Cold Functional Test Procedures, SPIRE-RAL-PRC-2398	
2.0	17.02.09		Update power on/off sequence to handle standalone CFT Correct section 7.2.3.16 & 7.2.3.18 for SMECENCPWR Correct document references in section 2.2	

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1 Scope

This document describes the set of Cold Functional Tests (CFTs) to be performed on the SPIRE FM Instrument for IST Instrument Commissioning (refs. AD6 & AD9) in Hell conditions or as a standalone test in He1 conditions.

It also includes the SMEC Functional & Microvibration Tests. However, these have to be run independently of the other parts of the CFT, as they require a very specific test and satellite configuration and will be run in Hel conditions

Both redundancies are tested within this procedure.

Constraints General

- This procedure requires the presence of SPIRE personnel as the I-EGSE will be required to assess the results online as part of the pass/fail criteria.
- Before carrying out the next procedure within the test sequence always ask for the go ahead by the SPIRE staff.

Constraints Specific

- Specific constraints apply if Launch Lock Latch status monitoring EGSE is fitted, see section 5.4.3.
- The **CFT** part of the procedure run as part of SPIRE IST Commissioning **shall** only be performed in Hell conditions
- The **CFT** part run standalone can be performed in He1 conditions
- The **SMEC** part of the procedure **shall** only be performed in Hel conditions, with satellite Horizontal with +Y axis up, and a recommended Cryostat fill level at < 50%.
- **SMEC** Microvibration tests shall be performed with minimal external acoustic noise/vibration (e.g. at night)
- For **SMEC** Functional tests:
  - Level 1 temperature between 10 K and 20 K with a stability of ca. 2 K is tolerable, since the encoder is less sensitive as it gets warmer
  - For Level 0 and Level 2 section 5.2 applies

1.1 Objective

The objective of the test is to functionally check the FM instrument as much as feasibly possible in Hel or Hell conditions and in an AIT environment.

1.2 Test Flow

The CFT flow is as follows:

1. Power on and configure SPIRE I-EGSE for test
2. Power on and configure SVM for IST Instrument Commissioning (IST START)
3. Power on NOMINAL SPIRE Prime DPU & DRCU and enable Mil1553B-bus interface
4. Run Nominal CFT Procedures
5. Power off MCU Prime
6. Disable Mil1553B-bus interface and Power off SPIRE Prime DRCU & DPU
7. Repeat Steps 3 – 6 for Spire Redundant CFT Procedures
8. Power off SVM including CCU (IST END)
9. Switch off all EGSE

The SMEC flow is as follows:

1. Power on and configure SPIRE I-EGSE for test
2. Power on and configure SVM for test including CCU
3. Power on NOMINAL SPIRE Prime DPU & DRCU and enable Mil1553B-bus interface
4. Run SMEC CFT Nominal Procedures
5. Run SMEC Microvibration Procedures (on Nominal only)
6. Power off MCU Prime
7. Disable Mil1553B-bus interface and Power off SPIRE Prime DRCU & DPU
8. Repeat Steps 3, 4, 6 & 7 for Spire Redundant SMEC CFT Procedures
9. Power off SVM including CCU
10. Switch off all EGSE

2 Documents/Drawings

2.1 Applicable Documents

AD 1	FM SPIRE PFM Final Electrical Integration Procedure	HP-2-ASED-TP-0166
AD 2	Herschel PCDU & CDMS Nominal Switch On/Off Procedure	HP-2-ASED-PR-0070
AD 3	Herschel SAT Emergency Switch Off Procedure	HP-2-ASED-PR-0071
AD 4	PA Plan	HP-2-ASED-PL-0007
AD 5	I-EGSE Switch ON/OFF Procedure	TBI
AD 6	Test Specification for Herschel Instrument AVM & FM Tests Performed at Satellite Level, Issue 2	H-P-2-ASP-TS-1083
AD 7	H-P GDIR	H-P-1-ASPI-SP-0027
AD 8	SPIRE I-EGSE Set-Up, Issue 2.2	SPIRE-RAL-DOC-002841
AD 9	Herschel Integrated Satellite Test Specification, Issue 6	H-P-2-ASP-SP-0939
AD 10	Herschel IST Lead Procedure	HP-2-ASED-TP-0134
AD11	SPIRE SMEC Launch Lock Status EGSE, issue 3.0	SPIRE-RAL-NOT-003015
AD12	S/C Configuration for IST Instrument Commissioning, Issue 1	HP-2-ASED-TP-0237

2.2 Reference Documents

RD 1	Herschel Planck Central Checkout System System User Manual	H-P-4-TE-MA-0010
RD 2	SPIRE Cold Functional Test Procedures, Iss. 2.6	SPIRE-RAL-PRC-2398
RD 3	Herschel CDMU ASW S/W Interface	H-P-4-SSF-IC-0001

	Control Document	
RD 4	Herschel CDMU BSW S/W Interface Control Document	H-P-4-SES-NT-0076
RD 5	SPIRE IID-B	SCI-PT-IIDB/SPIRE-02124
RD 6	SPIRE Functional Test Specification Iss. 1.4	SPIRE-RAL-DOC-001652
RD 7	SPIRE Instrument User Manual Iss. 1.4	SPIRE-RAL-PRJ-002395
RD 8	H/P OBT-UTC Time Synchronisation Technical Note Iss. 1.3	PT-CMOC-OPS-TN-6604-OPS- OGH
RD 9	SPIRE IST SPT Procedure; Iss 3.4	SPIRE-RAL-PRC-2704

2.3 Other Documents

None

2.4 Acronyms & Abbreviations

1553	MIL-STD-1553B conform communication interface
AAD	Attitude Anomaly Detector
ACC	ACMS Control Computer
ACMS	Attitude Control and Measurement Subsystem
AD	Applicable Document
AIR	ACC In Reconfiguration
AIT	Assembly, Integration and Test
AIV	Assembly, Integration and Verification
APID	Application Process ID
ASW	Application Software
AVM	Avionics Model
BOLC	BOLometer Control unit (PACS)
BSW	Basic Software
CBH	Catalyst Bed Heater
CCS	Central Check-out System
CCSDS	Consultative Committee for Space Data Systems
CDMU	Control and Data Management Unit
CDMS	Control and Data Management Sub-system

CFT	Cold Functional Test
CIR	CDMU In Reconfiguration
CLCW	Command Link Control Word
CLTU	Command Link Transmission Unit
CPDU	Command Pulse Distribution Unit
CRS	Coarse Rate Sensor
CTR	Central on board Reference Time
DCU	Detector Control Unit (SPIRE)
DEC	Detectors Electronics Control unit (PACS)
DMC	Detector and Mechanism Control unit (PACS)
DPU	Digital Processing Unit
DRCU	Detector Readout & Control Unit (SPIRE)
EEPROM	Electrically Erasable PROM
EGSE	Electrical Ground Support Equipment
FCL	Fold-back Current Limiter
FCU	FPU Control Unit (Spire)
FCV	Flow Control Valves
FDIR	Failure Detection, Isolation, and Recovery
FPU	Focal Plane Unit
GDIR	General Design and Interface Requirement
GRP	Group Heaters Switch
HBR	High Bit Rate
HL/HLC	High Level command
HP/HPC	High Priority commands
HPLM	Herschel PayLoad Module
HPSDB	Herschel Planck System Data Base
HW	Hardware
i.a.w.	In accordance with
I/F	InterFace
I/O	Input/Output
ICD	Interface Control Document
IST	Integrated System Test

LCL	Latching Current Limiter
LV	Latching Valves
LBR	Low Bit Rate
MAP	Multiplexed Access Point
MBR	Medium Bit Rate
MCU	Mechanisms Control Unit (SPIRE)
MEC	Mechanisms Electronics Control unit (PACS)
ML 16	Memory Load command (ML 16)
MM	Memory Module
MOIS	Mission Operations Information System
MTL	Mission Timeline
NRZ-L	Non Return to Zero – Litton
OBCP	On-Board Control Procedure
OBDH	On-Board Data Handling
OBMF	On-Board Monitoring Function
OBRT/OBT	On-Board Reference Time
OIRD	Operation Interface Requirement Document
PACS	Photodetector Array Camera & Spectrometer
P/L	Payload
PCDU/PCS	Power Control Distribution Unit/Power Control Subsystem
PM	Processor Module
PROM	Programmable Read Only Memory
PSK	Phase Shift Keying
RA	Rate Anomaly
RAM	Random Access Memory
RCS	Reaction Control Subsystem
RD	Reference Document
RF	Radio Frequency
RM	Reconfiguration Module
RT	1553 Remote Terminal
RTU	RT Unit
RTA	RTU

RWL	Reaction Wheel Assembly
SA	1553 Remote Terminal Sub Address
SAS	Sun Acquisition Sensor
SCOE	Special Check-out Equipment
SCU	Subsytems Control Unit (SPIRE)
SIR	S/C In Reconfiguration
SIT	Subsystem Integrated Test
SP	Sun Pointing
SPIRE	Spectral & Photometric Imaging Receiver
SPU	Signal Processing Unit (PACS)
SSMM	Solid State Mass Memory
STR	Star Tracker
SVM	Service Module
SW	Software
TAI	International Atomic Time
TC	TeleCommand
TFG	Transfer Frame Generator
TM	TeleMetry
TTC	Telemetry Tracking & Command subsystem
TTR	Telemetry Telecommand and Reconfiguration
UFT	Unit Functional Test
VC	Virtual Channel
WD	Watchdog

3 Configuration

3.1 Satellite Configuration

The test requires use of the FM SVM powered on including the CCU (connected to cryostat temperature and pressure sensors). Note this also means that the cryostat valves (commandable from the CCS) may also be connected therefore this has to be considered as a SAFETY critical area to be addressed in section 5.

For the CFT in Hell the satellite configuration will be as per the IST SPIRE Commissioning Configuration ref. AD10.

For the CFT in He1 after shipping to CSG, French Guiana the S/C will be powered on in a minimum configuration i.a.w. AD2.

For SMEC parts of the CFT a minimum SVM configuration can be used as per AD2.

The Cryostat and therefore the satellite must be horizontal (+Y axis up) to perform the SMEC parts (section 7.2.6) of the CFT.

SPIRE FM units will be powered ON as per this procedure and assumes that FPU has already been successfully integrated to the warm units.

3.2 EGSE Configuration

This test requires the EGSE to be configured and elements powered on in accordance with AD 2.

I-EGSE shall be configured and connected to the HPCCS in accordance with AD 5 & AD 8.

3.3 Set-up

SPIRE Test Scripts for the test must be loaded on to the HPCCS and checked in prior to start of test.

4 Test Sequence

Ensure that the latest delivery of SPIRE CFT & SPT test scripts are installed on the CCS prior to start of test.

The SPIRE I-EGSE will be running the following software for the test:

I-EGSE Software	Version	Comment
SPIRE MIB version		
SPIRE CUS version		
SCOS version		

The HPCSS HPSDB must also include the same SPIRE MIB version.

5 Conditions

5.1 Personnel

Responsibility	Name / Organisation
Test Director	
Test Conductor	
EGSE Operator	
PA Responsible	
Instrument Representative	
Customer Representative	
ESA Representative	

5.2 Environmental

The actual clean room and spacecraft environmental conditions for the test shall be recorded below.

Clean Room Conditions	Nominal	Actual
Clean Room Class	class 100000 or better	
Temperature	22°C ± 3°C	
Rel. Humidity	40 % - 60 %	
Pressure	Ambient	

S/C Environmental	Required	Actual
S/C Orientation	CFT: 20deg from Z, +Y down CFT-CSG: Vertical SMEC: Horizontal, +Y up	
Cryostat Status (Hel/Hell)	CFT: Hell CFT-CSG/SMEC: Hel	
Cryostat Level 0 Temp	CFT: T < 2.0K CFT-CSG/SMEC: 4.2K < T < 6.5K	
Cryostat Level 1 Temp (T235-T236)	CFT: T < 6.2K CFT-CSG/SMEC: 10K < T < 20K **	
Cryostat Level 2 Temp	CFT: T < 12K CFT-CSG/SMEC: 5K < T < 30K	
Cryostat Level 3 Temp	CFT-CSG/CFT: 5K < T < 50K SMEC: N/A	

** Stability of 2K/test period (ref. HP-2-ASED-MN-1528 10/04/08)

5.3 General Precautions and Safety

Non-test specific precautions and safety considerations are detailed in section 5.3 of AD 2. Specific safety issues and general precautions for the tests to be performed are detailed in the following sections.

5.3.1 General Safety Requirements, Precautions

In the event of unrecoverable anomaly requiring emergency switch off of the satellite, the switch off shall be performed in accordance with AD 3.

5.3.2 ESD constraints

Normal ESD constraints are to be observed during the test.

5.3.3 Cryo Specific Safety Requirements

During the test the CCU may be connected to the Cryostat sensors and valves. Although no valve operation is performed in this test all Cryogenic specific safety requirements shall be considered when running this procedure as indicated below.

Safety instruction for cryogenic hazards coming from the Helium system are as follows:

1	Helium itself is a non-toxic gas. The hazards to be expected are personal injuries from frostbites (cold surfaces, cold gas plumes), asphyxiation due to insufficient oxygen in the remaining air, loss of orientation due to dense fog generation and impacts of cold damaged structures.
2	Due to the amount of stored energy the Herschel cryostat is a pressure vessel and the general rules for pressure vessel design have to be followed. In addition to these general rules, the safety regulations at CSG launch site have to be considered. The application of these rules leads to a safety concept, which is based on the ‗leak before burst' criterion. Herschel is based on the following safety and reliability philosophy: a. Two failure tolerant b. Three independent paths for overpressure relief c. Passive safety system for all operation modes (no active controls for monitoring is required at any time) As emergency situations may occur at unexpected points in time and typically need immediate action, the full hierarchy of the project cannot be deployed and consultation of all knowledgeable persons may not be possible.
3	The main intent of immediate actions will therefore be to ensure safety of personnel and to bring the S/C into a safe waiting condition. The priority of safeguarding is 1) Personnel 2) S/C 3) Facility 4) Support equipment The second aim is to keep the cryostat near the foreseen test conditions in order to continue the test without unnecessary time delay if the failure can be corrected.
4	The ASED test director (or his representative) will be informed by the test personnel of any non-conformances, alarm and unforeseen events that might lead to emergency situations. The ASED test director (or his representative) will initiate immediate steps and call the decision committee (ASED test director, ASED PA, ESA test director, ASP representative, ETS representative) if necessary.

5	Prior to begin a pre-task briefing shall be performed to inform all participants about purpose of operation, possible hazards and emergency shut down
6	In case of operation of the Cryostat safety system the following IMMEDIATE activities shall be performed: • Operation of the safety valve: EVERYBODY has to leave the test room, except test Conductor and necessary CVSE operations personnel • Operation of burst disc: EVERYBODY has to leave the test room

5.3.4 Special QA Requirements

None.

5.4 GSE

Non-test specific GSE details are provided in section 5.4 of AD 2. Specific GSE needs for the tests to performed are detailed in the following sections.

5.4.1 MGSE

None.

5.4.2 CVSE

None.

5.4.3 EGSE

The I-EGSE is required for this test and will be connected to the HPCCS in accordance with AD 5.

For SMEC tests the Launch Lock latch monitoring EGSE maybe fitted to the S/C according to AD11.

5.4.4 OGSE

None.

5.4.5 Special Equipment

None.

6 Verification Requirements and Test Criteria

This is a functional check of all SPIRE PFM subsystems in Hel or Hell conditions and AIT configuration as per AD6 and AD9.

Functional performance and status parameter actual values recorded will be checked during the test and must be the same as the nominal status value indicated.

The test will only be deemed successful once all offline analysis of the results has been performed. Typically, the PTR will be held before completion of this activity and therefore only a preliminary assessment of the test success can be provided to allow disconnection of any specific GSE required for the test and which needs to be removed before further activities can be performed.

Enter Start Date|Time:			

7 Test Procedure

7.1 Initial EGSE and Satellite Configuration for the Test

The Spire FM Final Integration according to the Test Procedure ref. AD 1 must be successfully completed before the execution of this procedure.

The EGSE and Satellite must be configured according to AD 2 prior to start of test.

In case of anomaly on SPIRE requiring immediate switch off as directed by SPIRE responsible supporting the test section 7.2.8 shall be executed.

In the event of emergency the Satellite SHALL be switched down according to AD 3.

Enter Start Date|Time:			

7.2 Step by Step Procedure

Test Location:	
Test Session Id:	
Test Environment:	

7.2.1 EGSE & Satellite Switch On for CFT

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	Satellite & EGSE Switch On						
0	Confirm all constraints for the CFT as defined in Section 1 have been fulfilled prior to starting the test	OK					
1	Confirm I-EGSE physically connected to HPCCS	OK					
2	Switch on & configure SPIRE I-EGSE i.a.w. **AD5 & AD 8**	OK					
3	Confirm SPIRE I-EGSE is in the correct configuration as per AD5 & AD 8 and TIME synchronised with HPCCS	OK					
4a	If test is perform as part of SPIRE IST Commissioning then switch on HPCCS, SCOEs and Satellite/SVM i.a.w. AD 10 sections 7.1 and 7.2. In section 7.2.4 selecting the test case SPIRE Commissioning	OK					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	5.8.4.5.1, in the Master GUI						
4b	If test is to be performed as a standalone CFT then switch on HPCCS, SCOEs and S/C and configure into Basic Test Mode, with SSMM/Packet Stores initialised and CCU monitoring set to Mode 2 i.a.w. AD2 section 7.5	OK					
5	Only if performing SPIRE IST Commissioning, configure the Satellite specifically i.a.w. with AD12 Section 7.2 continuing up to step 41	OK					
6	Only if performing SPIRE IST Commissioning confirm that EGSE and Satellite are in the correct configuration as per AD 10	OK					
7	Connect HPCCS to CRYOSCOE and verify CryoSCOE data is being received on the CCS by executing the following script: **K102999ECVT035_ASDGEN_SCOE_CCU_LOG**	OK					
8	From HPCCS Test Conductor console issue command to connect to SPIRE I-EGSE **connect HSPIREEGSE**	OK					
9	Confirm from HPCCS and SPIRE I-EGSE that the connection has been established	YZS29940= CONNECTED			**AND SYS_PARS**		
10	Verify that I-EGSE is receiving CCU Cryo packets	OK					
11	On HPCCS start the following test script: **SPIRE_ALL_SubscribeParams**	OK					
12	Verify correct connection and time synchronisation with IEGSE: **Y102999ETVT036_ASDGEN_VERSPIREIEGSE**	OK					
13	If required load Synoptics INSTRUMENTS on HPCCS to display	OK					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	SPIRE status overview						
14	If not running already, start the instrument temperature logging: **Z102999SCVT025_ASDGEN_INSTTEMP_LOG**	OK					
	READY FOR START OF SPIRE CFT						

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2 Cold Functional Tests - Nominal

7.2.2.1 Switch ON SPIRE PRIME

The following will switch ON and configure SPIRE Prime instrument in REDY (Standby) mode. HKTM packets will be generated on APIDs 1280 and 1282 decimal (these can be observed using TMPH with corresponding filter – note however a limited number of TMPHs should be running at one time).

During power on of SPIRE a number of soft/hard OOLs are reported due to the sequential switch on of the units. This is expected and will clear when SPIRE is in REDY mode. When in REDY mode one parameter remains OOL (soft) namely SMD2V505 this is also expected.

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
1.	On HPCCS start Packet History displays for the following APIDs:1280,1282	OK				
2.	From the HPCCS test conductor console start the test script to power on SPIRE Prime: **S102999SCVT031_ASDCFTSPIR_PWR_ON_P**	OK		AND: ZAD07999, ZAD14999 MIM: LCL_HERSCHEL		

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
3.	On HPCCS when prompted: "SPIRE Switch ON for Cold FT related tests in Hel/Hell conditions only - Select NO to abort TS if not correct" **Select YES**	YES				
	If **YES** is selected the test script will go on to automatically power on all SPIRE warm units, force boot the DPU ASW and configure the instrument to Standby mode. Reply to prompts as indicated below.					
4.	On HPCCS when prompted: "Check Telemetry Updating Correctly and OBT is Consistent with CDMU - OK to continue" Select OK	OK		**AND: SA_1_559**		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
5.	If I-EGSE connected when prompted on HPCCS, perform check requested then select **OK**: `"Check IEGSE Time Consistent - OK to continue when RAL confirm"`	OK				
6.	On HPCCS when prompted: `"Check Telemetry No Longer Updating - OK to continue"` Check that parameters: THSK TM2N Select OK to continue	 Not refreshing Not incrementing OK		Note: Two TC failures on SCR00500 are expected because HKTM has been stopped		
7.	On HPCCS when prompted: `"Check Telemetry Updating Correctly - OK to continue"` Check that parameters: THSK TM2N	 Refreshing @ 1Hz Incrementing by 1 @ 1Hz		**AND: SA_1_559**		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	Select OK to continue	OK				
8.	On HPCCS when all autonomous actions have been completed by the power on script **S102999SCVT031_ASDCFTSPIR_PWR_ON_P** it will prompt: ~~S~~et Bus Profile Back to Original Setting?" Select NO	NO				
9.	At the prompt: "Bus Profile left unchanged" Select OK to continue	OK				
10.	Verify HK TM packets are being received on APIDs 1280 & 1282	OK				
	SPIRE DPU & DRCU powered					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.2 Procedure SPIRE-IST-COLD-FUNC-SCU-02-P

Version	2.4
Date	6th December 2007
Purpose	SCU Nominal Science Contents Check PRIME
Initial configuration	SPIRE DPU and DRCU PRIME are switched ON, SPIRE HK is being produced
Final configuration	Unchanged
Preconditions	• **SPIRE-IST-COLD-DPU-ON-P** and **SPIRE-IST-COLD-DRCU-ON-P** procedures have been executed. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • I-EGSE is up and running • DPU AND OBS PARAMETERS & FUNCTIONAL TEST PARAMETERS displays are selected on the CCS
Duration	5 minutes
Pass/Fail criteria	HK parameters have the expected values

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCU-02-P.tcl	SCUFRAMECNT TM5N	0/31 0x3FFF/1		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.3 Procedure SPIRE-IST-COLD-FUNC-SCU-03-P

Version	2.4
Date	6th December 2007
Purpose	SCU DC thermometry check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and DC thermometry is ON
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	8 minutes
Pass/Fail Criteria	SCU DC thermometry channels show temperature readings according to the actual instrument temperature

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCU-03-P.tcl	—	—	—	
2	**Wait for the parameter BBFULLTYPE to get set to SCU_DC_Therm**	—	—	—	

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
3	A few seconds later record the value of parameter SCUTEMPSTAT	SCUTEMPSTAT	0/0xFFFF/0xFFFF		
4	If the instrument is at He I temperatures check the values of SCU DC thermometry channels.	 PUMPHTRTEMP PUMPHSTEMP EVAPHSTEMP SHUNTTEMP EMCFILTEMP SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP BSMTEMP	(All Values TBC) ~4.2K ~4.4K ~4.3K ~4.2K ~4.8K ~4.2K ~4.2K ~4.8K ~4.8K ~4.7K ~4.8K ~4.8K ~4.8K ~4.7K ~4.7K ~4.8K		
5	If the instrument is at He II temperatures check the values of	 PUMPHTRTEMP	(All Values TBC) -/~4.6K		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
	SCU DC thermometry channels.	PUMPHSTEMP EVAPHSTEMP SHUNTTEMP EMCFILTEMP SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP BSMTEMP	-/~3.0K -/~3.0K -/~1.7K -/~4.6K -/~1.7K -/~1.7K -/~4.6K -/~4.6K -/~4.5K -/~4.6K -/~4.6K -/~4.6K -/~4.6K -/~4.6K -/~4.5K		
6	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.4 Procedure SPIRE-IST-COLD-FUNC-SCU-06-P

Version	2.4
Date	6th December 2007
Purpose	SCU AC thermometry check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and DC thermometry is ON
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail Criteria	SCU AC thermometry channel shows temperature readings according to the actual instrument temperature

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCU-06-P.tcl	—	—	—	
2	**Wait for the parameter BBFULLTYPE to get set to SCU_AC_Therm**	—	—	—	
3	A few seconds later record the value of parameter SUBKSTAT	SUBKSTAT	0/1/1		
4	If the instrument is at He I temperatures check the value of SCU AC thermometry channel.	SUBKTEMP	~4K		
5	If the instrument is at He II temperatures check the value of SCU AC thermometry channel.	SUBKTEMP	~1.7K		
6	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.5 Procedure SPIRE-IST-COLD-FUNC-SCU-07-P

Version	2.4
Date	6th December 2007
Purpose	Sorption Cooler Heater Check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and DC thermometry is ON
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Constraints	**This test should not be performed at He II temperatures, unless specifically instructed to do so by the I-EGSE staff.**
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail Criteria	Sorption cooler heat switches and pump heater show expected voltages

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCU-07-P.tcl	—	—	—	
2	Wait for the parameter BBFULLTYPE to get set to Cooler_Htr_Chk	BBFULLTYPE	Cooler_Htr_Chk		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
3	Record the value of parameter SPHSV – the Sorption Pump Heat Switch Voltage. This voltage stays on for ~20 seconds. Wait for the voltage to go to zero to continue.	SPHSV – mV	0/~323/0		
4	Record the value of parameter EVHSV – the Evaporator Heat Switch Voltage. This voltage stays on for ~20 seconds. Wait for the voltage to go to zero to continue.	EVHSV – mV	0/~323/0		
5	Record the value of parameter SPHTRV – the Sorption Pump Heater Voltage. This voltage stays on for ~20 seconds.Wait for the voltage to go to zero to continue.	SPHTRV – V	0/~8.8/0		
6	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.6 Procedure SPIRE-IST-COLD-FUNC-PCAL-01-P

Version	1.0
Date	6th December 2007
Purpose	PCAL Characterisation Check (PRIME)
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	Unchanged
Constraints	**This test should only be performed at He I or He II temperatures**
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail Criteria	PCAL voltage and current agree with expected values

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter Name – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-PCAL-01-P.tcl	—	—	—	
2	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Final Configuration: Unchanged

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.7 Procedure SPIRE-IST-COLD-FUNC-SCAL-01-P

Version	1.0
Date	6th December 2007
Purpose	SCAL Characterisation Check (PRIME)
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	Unchanged
Constraints	**This test should only be performed at He I or He II temperatures.** **If the test is to be performed at He II temperature then please confirm with I-EGSE staff first.**
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	18 minutes
Pass/Fail criteria	SCAL2 and SCAL4 voltage and currents agree with expected values

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCAL-01-P.tcl	—	—	—	
2	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.8 Procedure SPIRE-IST-COLD-FUNC-MCU-01-P

Version	2.4
Date	6th December 2007
Purpose	MCU (PRIME) Boot Check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	MCU voltages and board temperatures show expected _ON‘ values

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-MCU-01-P.tcl	—	—	—	
2	Check that the MCU is booted up successfully	MCUBITSTAT	0/1/1		
3	Check MCU HK parameter values and ensure that the values are refreshing	MCUP5V MCUP14V MCUM14V MCUP15V MCUM15V MCUMACTEMP MCUSMECTEMP MCUBSMTEMP	~ 5.0 ± 0.2V ~ 14.0 ± 0.5V ~ -14.0 ± 0.5V ~ 15.0 ± 0.5V ~ -15.0 ± 0.5V ~300K ~300K ~300K		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.9 Procedure SPIRE-IST-COLD-FUNC-MCU-03-P

Version	2.4
Date	6th December 2007
Purpose	MCU Nominal Science Contents Check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	Unchanged.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified MCU HK parameters show expected increment

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-MCU-03-P.tcl	MCUFRAMECNT	0/-/297		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.10 Procedure SPIRE-IST-COLD-FUNC-BSM-01-P

Version	2.4
Date	6th December 2007
Purpose	BSM (PRIME) Chop/Jiggle Sensor Check.
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. BSM Chop/Jiggle sensors are ON.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	HK Parameters CHOPSENSPWR and JIGGSENSPWR show expected ON values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-BSM-01-P.tcl	—	—	—	
2	Check that the Chop and Jiggle sensors have switched on	CHOPSENSPWR JIGGSENSPWR	0/1/1 0/1/1		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.11 Procedure SPIRE-IST-COLD-FUNC-BSM-03-P

Version	2.4
Date	6th December 2007
Purpose	BSM (PRIME) Open Loop Dynamics Check.
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. BSM Chop/Jiggle sensors are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	CHOPSENSSIG/JIGGSENSIG HK parameter evolve in the same direction as the commanded positions

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-BSM-03-P.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.12 Procedure SPIRE-IST-COLD-FUNC-BSM-05A-P

Version	2.4
Date	6th December 2007
Purpose	BSM (PRIME) Open Loop Chop Test
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. BSM Chop/Jiggle sensors are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	The BSM Chops between the commanded positions

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-BSM-05A-P.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.13 Procedure SPIRE-IST-COLD-FUNC-BSM-05B-P

Version	2.4
Date	6th December 2007
Purpose	BSM (PRIME) Close Loop Chop Test
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. BSM Chop/Jiggle sensors are ON.
Final configuration	BSM is in closed loop mode
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • CHOP PARAMETERS and JIGGLE PARAMETERS displays are selected on the CCS
Duration	5 minutes
Pass/Fail criteria	The BSM Chops in between the commanded positions

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-BSM-INIT-P.tcl	CHOPLOOPMODE JIGGLOOPMODE	3/-/1 3/-/1		
2	Execute TCL script SPIRE-IST-COLD-FUNC-BSM-05B-P.tcl	—	—	—	
3	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.14 Procedure SPIRE-IST-COLD-FUNC-BSM-06-P

Version	2.4
Date	6th December 2007
Purpose	BSM (PRIME) Closed Loop Operational Mode Chop Test
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. BSM Chop/Jiggle sensors are ON. BSM is in closed loop.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • CHOP PARAMETERS and JIGGLE PARAMETERS displays are selected on the CCS
Duration	5 minutes
Pass/Fail criteria	The BSM Chops between the commanded positions

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-BSM-06-P.tcl	CHOPLOOPMODE JIGGLOOPMODE	1/1/1 1/1/1		
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.15 Procedure SPIRE-IST-COLD-BSM-OFF-P

Version	2.4
Date	6th December 2007
Purpose	BSM (PRIME) Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. BSM Chop/Jiggle sensors are ON.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. BSM Chop/Jiggle sensors are OFF.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	HK Parameters CHOPSENSPWR and JIGGSENSPWR show expected OFF values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-BSM-OFF-P.tcl	—	—	—	
2	Check that the power to the BSM sensors is switched off	CHOPSENSPWR JIGGSENSPWR	1/-/0 1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.16 Procedure SPIRE-IST-COLD-FUNC-SMEC-01-P

Version	2.4
Date	6th December 2007
Purpose	SMEC (PRIME) Encoder/LVDT Sensor Check.
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	HK Parameters SMECENCPWR and SMECLVDTPWR show expected ON values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-01-P.tcl	—	—	—	
2	Check that power to the SMEC LED and LVDT sensor is on	SMECENCPWR SMECLVDTPWR	0/-/1 0/-/1		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.17 Procedure SPIRE-IST-COLD-FUNC-SMEC-03-P

Version	2.4
Date	6th December 2007
Purpose	SMEC (PRIME) Encoder Integrity Check.
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	MCUENGSMECENCSIG1/2 increase as the encoder power is increased

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-03-P.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.18 Procedure SPIRE-IST-COLD-SMEC-OFF-P

Version	2.4
Date	6th December 2007
Purpose	SMEC (PRIME) Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are OFF.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	HK Parameters SMECENCPWR and SMECLVDTPWR show expected OFF values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-SMEC-OFF-P.tcl	—	—	—	
2	Check that the power to the SMEC sensors is switched off	SMECENCPWR SMECLVDTPWR	1/-/0 1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.19 Procedure SPIRE-IST-COLD-FUNC-DCU-02-P

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	Cryostat Check Procedure for CFT						
2	**Prior to performing next step verify that Level 3 temperature is between 5K and 50K (sensors T246 & T247)**	OK					
3	Record Temperatures: T246: (KD223302 if connected to CCU) T247: (KD223303 if connected to CCU)	 >5K - <50K >5K - <50K					
	End of Cryostat Check						

Version	2.4
Date	6th December 2007
Purpose	DCU Nominal Science Contents Check PRIME
Initial configuration	SPIRE DPU and DRCU PRIME are switched ON, SPIRE HK is being produced and MCU is booted.
Final configuration	Unchanged
Preconditions	• **SPIRE-IST-COLD-DPU-ON-P** and **SPIRE-IST-COLD-DRCU-ON-P** procedures have been executed. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • I-EGSE is up and running • DCU PARAMETERS display is selected on the CCS • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	DCU HK parameters increment as expected

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-02-P.tcl	DCUFRAMECNT	n/n+700		
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.20 Procedure SPIRE-IST-COLD-FUNC-DCU-11-PHOT-P

Version	2.4
Date	6th December 2007
Purpose	Photometer BDAs switch ON check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and Photometer BDAs are ON.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	7 minutes
Pass/Fail criteria	DCU HK parameters show expected values

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-11-PHOT-P.tcl	—	—	—	
2	Check that the Photometer detectors and LIAs are switched on	PSWJFETSTAT PMLWJFETSTAT PLIABITSTAT PLIAP5V PLIAP9V PLIAM9V	0/-/0x3F 0/-/0x7F 1 ~0/ ~+5.17 ± 0.1V ~0/ ~+11.53 ± 0.1V ~0/ ~-11.53 ± 0.1V		
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.21 Procedure SPIRE-IST-COLD-FUNC-DCU-13-PHOT-P

Version	2.4
Date	6th December 2007
Purpose	Photometer BDAs integrity check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and Photometer BDAs are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	15 minutes
Pass/Fail criteria	DCU HK parameters show expected values

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Check that Photometer LIAs and detectors are switched on	PLIABITSTAT PSWJFETSTAT PMLWJFETSTAT	1 0x3F 0x7F		
2	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-13-PHOT-P.tcl	—	—	—	
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.22 Procedure SPIRE-IST-COLD-FUNC-DCU-14-PHOT-P

Version	2.4
Date	6th December 2007
Purpose	Photometer BDAs noise level check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and Photometer BDAs are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Photometer BDA signals show no excess noise

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Check that Photometer LIAs and detectors are switched on	PLIABITSTAT PSWJFETSTAT PMLWJFETSTAT	1 0x3F 0x7F		
2	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-14-PHOT-P.tcl	—	—	—	
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.23 Procedure SPIRE-IST-COLD -PHOT-VSS-P

Version	1.1
Date	10th July 2008
Purpose	Photometer BDAs Vss Test PRIME
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and Photometer BDAs are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	40 minutes
Pass/Fail criteria	Photometer BDA Vss values are optimised

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Check that Photometer LIAs and detectors are switched on	PLIABITSTAT PSWJFETSTAT PMLWJFETSTAT	1 0x3F 0x7F		
2	Execute TCL script SPIRE-IST-COLD -PHOT-VSS-P.tcl	—	—	—	
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.24 Procedure SPIRE-IST-COLD-PDET-OFF-P

Version	2.4
Date	6th December 2007
Purpose	Photometer BDAs Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and Photometer BDAs are ON
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and Photometer BDAs are OFF
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	DCU HK parameters show expected values

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-PDET-OFF-P.tcl	—	—	—	
2	Check that the Photometer detectors are switched off	PSWJFETSTAT PMLWJFETSTAT	0x3F/-/0 0x7F/-/0		
3	Check that the Photometer LIAs are switched off	PLIABITSTAT	1/-/0		
4	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.25 Procedure SPIRE-IST-COLD-FUNC-DCU-11-SPEC-P

Version	2.4
Date	6th December 2007
Purpose	Spectrometer BDAs switch ON check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and Spectrometer BDAs are ON.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	7 minutes
Pass/Fail criteria	DCU HK parameters show expected values

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-11-SPEC-P.tcl	—	—	—	
2	Check that the Spectrometer detectors and LIAs are switched on	SPECJFETSTAT SLIABITSTAT SLIAP5V SLIAP9V SLIAM9V	0/-/7 1 ~0/ ~+5.23 ± 0.1 ~0/ ~+11.57 ± 0.1 ~0/ ~-11.54 ± 0.1		
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.26 Procedure SPIRE-IST-COLD-FUNC-DCU-13-SPEC-P

Version	2.4
Date	6th December 2007
Purpose	Spectrometer BDAs integrity check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and Spectrometer BDAs are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	12 minutes
Pass/Fail criteria	DCU HK parameters show expected values

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Check that the Spectrometer detectors and LIAs are switched on	SPECJFETSTAT SLIABITSTAT	7 1		
2	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-13-SPEC-P.tcl	—	—	—	
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.27 Procedure SPIRE-IST-COLD-FUNC-DCU-14-SPEC-P

Version	2.4
Date	6th December 2007
Purpose	Spectrometer BDAs noise check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and Spectrometer BDAs are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Spectrometer BDA signals show no excess noise

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Check that the Spectrometer detectors and LIAs are switched on	SPECJFETSTAT SLIABITSTAT	7 1		
2	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-14-SPEC-P.tcl	—	—	—	
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.28 Procedure SPIRE-IST-COLD- SPEC-VSS-P

Version	2.5
Date	10th July 2008
Purpose	Spectrometer BDAs Vss Test PRIME
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and Spectrometer BDAs are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	40 minutes
Pass/Fail criteria	Spectrometer BDA Vss values are optimised

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Check that the Spectrometer detectors and LIAs are switched on	SPECJFETSTAT SLIABITSTAT	7 1		
2	Execute TCL script SPIRE-IST-COLD-SPEC-VSS-P.tcl	—	—	—	
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.29 Procedure SPIRE-IST-COLD-SDET-OFF-P

Version	2.4
Date	6th December 2007
Purpose	Spectrometer BDAs Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and Spectrometer BDAs are ON
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and Spectrometer BDAs are OFF
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	DCU HK parameters show expected values

Procedure Steps:

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-SDET-OFF-P.tcl	—	—		
2	Check that the Spectrometer detectors are switched off	SPECJFETSTAT	7/-/0		
3	Check that the Spectrometer LIAs are switched off	SLIABITSTAT	1/-/0		
4	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	Cryostat Check Procedure for CFT						
5	Record Temperatures: T246: (KD223302 if connected to CCU) T247: (KD223303 if connected to CCU)	 >5K - <50K >5K - <50K					
6	**Inform Cryo Engineers that Level 3 temperature no longer needs to be maintained between 5K and 50K**	OK					
	End of Cryostat Check						

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.30 Procedure SPIRE-IST-COLD-MCU-OFF-P

Version	2.4
Date	6th December 2007
Purpose	MCU PRIME Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is OFF.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is ON. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified MCU HK Parameter shows expected value.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-MCU-OFF-P.tcl	—	—	—	
2	Check that the MCU is switched off	MCUBITSTAT	1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.31 Procedure SPIRE-IST-COLD-SCU-OFF-P

Version	2.4
Date	6th December 2007
Purpose	SCU PRIME Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is OFF
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified SCU HK Parameters show expected value.

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-SCU-OFF-P.tcl	—	—	—	
2	A few seconds later record the value of parameter SCUTEMPSTAT	SCUTEMPSTAT	0xFFFF/-/0		
3	A few seconds later record the value of parameter SUBKSTAT	SUBKSTAT	1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.2.32 Switch OFF SPIRE PRIME

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
1.	From the HPCCS test conductor console start the test script to power OFF SPIRE Prime: **S102999SCVT032_ASDCFTSPIR_PWR_OFF_P**	OK				
2.	On HPCCS when prompted: ~~-~~SPIRE Switch OFF for CFT related tests in Hel/Hell conditions only - Select NO to abort TS if not correct" **Select YES**	YES				
	If **YES** is selected the test script will go on to automatically power off all SPIRE warm units.					

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	Note that during Switch OFF of SPIRE the following (5,2) and (5,4) event messages on APID 1280 may be expected and do not indicate a problem: a) EVID 1313 No_MCU_Response_Error b) EVID 21773 ALARM_LSMCU_DEAD **However, be aware that if FDIR is enabled for SPIRE in the CDMU then this may trigger an OBCP**					
3.	On HPCCS when prompted: "Check Telemetry No Longer Updating - OK to continue" Check that parameters: THSK TM2N	 Not refreshing Not incrementing		**AND: SA_1_559**		
4.	Select OK to continue	OK				

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
5.	On HPCCS when all autonomous actions have been completed by the power on script **S102999SCVT032_ASDCFTSPIR_PWR_OFF_P** it will prompt: ~~-~~Bus profile left as SPIRE PRIME, change manually after if required - OK to continue"					
6.	Select OK to continue	OK				
7.	On HPCCS stop Packet History displays for the following APIDs:1280,1282	OK				
	SPIRE PRIME OFF					

Enter Start Date|Time:			

7.2.3 Cold Functional Tests – Redundant

7.2.3.1 Switch ON SPIRE REDUNDANT

The following will switch ON and configure SPIRE Redundant instrument in REDY (Standby) mode. HKTM packets will be generated on APIDs 1281 dec and 1283 decimal (these can be observed using TMPH with corresponding filter – note however a limited number of TMPHs should be running at one time).

During power on of SPIRE a number of soft/hard OOLs are reported due to the sequential switch on of the units. This is expected and will clear when SPIRE is in REDY mode. When in REDY mode one parameter remains OOL (soft) namely SMD2V505 this is also expected.

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
1.	On HPCCS start Packet History displays for the following APIDs:1281,1283	OK				
2.	From the HPCCS test conductor console start the test script to power on SPIRE Redundant: **S102999SCVT033_ASDCFTSPIR_PWR_ON_R**	OK		AND: ZAD07999, ZAD14999 MIM: LCL_HERSCHEL		

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
3.	On HPCCS when prompted: ~~-~~SPIRE Switch ON for Cold FT related tests in Hel/Hell conditions only - Select NO to abort TS if not correct" **Select YES**	YES				
	If **YES** is selected the test script will go on to automatically power on all SPIRE warm units, force boot the DPU ASW and configure the instrument to Standby mode. Reply to prompts as indicated below.					
4.	On HPCCS when prompted: "Check Telemetry Updating Correctly and OBT is Consistent with CDMU - OK to continue" **Select OK**	OK		**AND: SA_1_559**		
5.	If I-EGSE connected when prompted on HPCCS, perform check requested then select **OK**: "Check IEGSE Time Consistent - OK to continue when RAL confirm"	OK				

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
6.	On HPCCS when prompted: "Check Telemetry No Longer Updating - OK to continue" Check that parameters: THSK TM2N Select OK to continue	 Not refreshing Not incrementing OK		Note: Two TC failures on SCR00500 are expected because HKTM has been stopped		
7.	On HPCCS when prompted: "Check Telemetry Updating Correctly - OK to continue" Check that parameters: THSK TM2N Select OK to continue	 Refreshing @ 1Hz Incrementing by 1 @ 1Hz OK		**AND: SA_1_559**		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
8.	On HPCCS when all autonomous actions have been completed by the power on script **S102999SCVT033_ASDCFTSPIR_PWR_ON_R** it will prompt: ~~-~~Set Bus Profile Back to Original Setting?" Select NO	NO				
9.	At the prompt: "Bus Profile left unchanged" Select OK to continue	OK				
10.	Verify HK TM packets are being received on APIDs 1281 & 1283	OK				
	SPIRE DPU & DRCU Redundant powered					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.2 Procedure SPIRE-IST-COLD-FUNC-SCU-02-R

Version	2.4
Date	6th December 2007
Purpose	SCU Nominal Science Contents Check REDUNDANT
Initial configuration	SPIRE DPU and DRCU REDUNDANT are switched ON, SPIRE HK is being produced
Final configuration	Unchanged
Preconditions	• **SPIRE-IST-COLD-DPU-ON-R** and **SPIRE-IST-COLD-DRCU-ON-R** procedures have been executed. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • I-EGSE is up and running • DPU AND OBS PARAMETERS & FUNCTIONAL TEST PARAMETERS displays are selected on the CCS
Duration	5 minutes
Pass/Fail criteria	HK parameters have the expected values

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCU-02-R.tcl	SCUFRAMECNT TM5N	0/31 0x3FFF/1		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.3 Procedure SPIRE-IST-COLD-FUNC-SCU-03-R

Version	2.4
Date	6th December 2007
Purpose	SCU DC thermometry check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and DC thermometry is ON
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	8 minutes
Pass/Fail Criteria	SCU DC thermometry channels show temperature readings according to the actual instrument temperature

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCU-03-R.tcl	—	—	—	
2	**Wait for the parameter BBFULLTYPE to get set to SCU_DC_Therm**	—	—	—	

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
3	A few seconds later record the value of parameter SCUTEMPSTAT	SCUTEMPSTAT	0/0xFFFF/0xFFFF		
4	If the instrument is at He I temperatures check the values of SCU DC thermometry channels.	 PUMPHTRTEMP PUMPHSTEMP EVAPHSTEMP SHUNTTEMP EMCFILTEMP SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP BSMTEMP	(All Values TBC) ~4.2K ~4.4K ~4.3K ~4.2K ~4.8K ~4.2K ~4.2K ~4.8K ~4.8K ~4.7K ~4.8K ~4.8K ~4.8K ~4.7K ~4.7K ~4.8K		
5	If the instrument is at He II temperatures check the values of	 PUMPHTRTEMP	(All Values TBC) -/~4.6K		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
	SCU DC thermometry channels.	PUMPHSTEMP EVAPHSTEMP SHUNTTEMP EMCFILTEMP SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP BSMTEMP	-/~3.0K -/~3.0K -/~1.7K -/~4.6K -/~1.7K -/~1.7K -/~4.6K -/~4.6K -/~4.5K -/~4.6K -/~4.6K -/~4.6K -/~4.6K -/~4.6K -/~4.5K		
6	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.4 Procedure SPIRE-IST-COLD-FUNC-SCU-06-R

Version	2.4
Date	6th December 2007
Purpose	SCU AC thermometry check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and DC thermometry is ON
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail Criteria	SCU AC thermometry channel shows temperature readings according to the actual instrument temperature

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCU-06-R.tcl	—	—	—	
2	**Wait for the parameter BBFULLTYPE to get set to SCU_AC_Therm**	—	—	—	
3	A few seconds later record the value of parameter SUBKSTAT	SUBKSTAT	0/1/1		
4	If the instrument is at He I temperatures check the value of SCU AC thermometry channel.	SUBKTEMP	~4K		
5	If the instrument is at He II temperatures check the value of SCU AC thermometry channel.	SUBKTEMP	~1.7K		
6	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.5 Procedure SPIRE-IST-COLD-FUNC-SCU-07-R

Version	2.4
Date	6th December 2007
Purpose	Sorption Cooler Heater Check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and DC thermometry is ON
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Constraints	**This test should not be performed at He II temperatures, unless specifically instructed to do so by the I-EGSE staff.**
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail Criteria	Sorption cooler heat switches and pump heater show expected voltages

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCU-07-R.tcl	—	—	—	
2	Wait for the parameter BBFULLTYPE to get set to Cooler_Htr_Chk	BBFULLTYPE	Cooler_Htr_Chk		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
3	Record the value of parameter SPHSV – the Sorption Pump Heat Switch Voltage. This voltage stays on for ~20 seconds. Wait for the voltage to go to zero to continue.	SPHSV – mV	0/~323/0		
4	Record the value of parameter EVHSV – the Evaporator Heat Switch Voltage. This voltage stays on for ~20 seconds. Wait for the voltage to go to zero to continue.	EVHSV – mV	0/~323/0		
5	Record the value of parameter SPHTRV – the Sorption Pump Heater Voltage. This voltage stays on for ~20 seconds.Wait for the voltage to go to zero to continue.	SPHTRV – V	0/~8.8/0		
6	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.6 Procedure SPIRE-IST-COLD-FUNC-PCAL-01-R

Version	1.0
Date	6th December 2007
Purpose	PCAL Characterisation Check (REDUNDANT)
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	Unchanged
Constraints	**This test should only be performed at He I or He II temperatures**
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail Criteria	PCAL voltage and current agree with expected values

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter Name – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-PCAL-01-R.tcl	—	—	—	
2	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Final Configuration: Unchanged

Enter Start Date|Time:			

7.2.3.7 Procedure SPIRE-IST-COLD-FUNC-SCAL-01-R

Version	1.0
Date	6th December 2007
Purpose	SCAL Characterisation Check (REDUNDANT)
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	Unchanged
Constraints	**This test should only be performed at He I or He II temperatures.** **If the test is to be performed at He II temperature then please confirm with I-EGSE staff first.**
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	18 minutes
Pass/Fail criteria	SCAL2 and SCAL4 voltage and currents agree with expected values

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCAL-01-R.tcl	—	—	—	
2	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.8 Procedure SPIRE-IST-COLD-FUNC-MCU-01-R

Version	2.4
Date	6th December 2007
Purpose	MCU (REDUNDANT) Boot Check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	MCU voltages and board temperatures show expected _ON‘ values

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-MCU-01-R.tcl	—	—	—	
2	Check that the MCU is booted up successfully	MCUBITSTAT	0/1/1		
3	Check MCU HK parameter values and ensure that the values are refreshing	MCUP5V MCUP14V MCUM14V MCUP15V MCUM15V MCUMACTEMP MCUSMECTEMP MCUBSMTEMP	~ 5.0 ± 0.2V ~ 14.0 ± 0.5V ~ -14.0 ± 0.5V ~ 15.0 ± 0.5V ~ -15.0 ± 0.5V ~300K ~300K ~300K		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.9 Procedure SPIRE-IST-COLD-FUNC-MCU-03-R

Version	2.4
Date	6th December 2007
Purpose	MCU Nominal Science Contents Check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	Unchanged.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified MCU HK parameters show expected increment

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-MCU-03-R.tcl	MCUFRAMECNT	0/-/297		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.10 Procedure SPIRE-IST-COLD-FUNC-BSM-01-R

Version	2.4
Date	6th December 2007
Purpose	BSM (REDUNDANT) Chop/Jiggle Sensor Check.
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. BSM Chop/Jiggle sensors are ON.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	HK Parameters CHOPSENSPWR and JIGGSENSPWR show expected ON values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-BSM-01-R.tcl	—	—	—	
2	Check that the Chop and Jiggle sensors have switched on	CHOPSENSPWR JIGGSENSPWR	0/1/1 0/1/1		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.11 Procedure SPIRE-IST-COLD-FUNC-BSM-03-R

Version	2.4
Date	6th December 2007
Purpose	BSM (REDUNDANT) Open Loop Dynamics Check.
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. BSM Chop/Jiggle sensors are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	CHOPSENSSIG/JIGGSENSIG HK parameter evolve in the same direction as the commanded positions

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-BSM-03-R.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.12 Procedure SPIRE-IST-COLD-FUNC-BSM-05A-R

Version	2.4
Date	6th December 2007
Purpose	BSM (REDUNDANT) Open Loop Chop Test
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. BSM Chop/Jiggle sensors are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	The BSM Chops between the commanded positions

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-BSM-05A-R.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.13 Procedure SPIRE-IST-COLD-FUNC-BSM-05B-R

Version	2.4
Date	6th December 2007
Purpose	BSM (REDUNDANT) Close Loop Chop Test
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. BSM Chop/Jiggle sensors are ON.
Final configuration	BSM is in closed loop mode
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • CHOP PARAMETERS and JIGGLE PARAMETERS displays are selected on the CCS
Duration	5 minutes
Pass/Fail criteria	The BSM Chops in between the commanded positions

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-BSM-INIT-R.tcl	CHOPLOOPMODE JIGGLOOPMODE	3/-/1 3/-/1		
2	Execute TCL script SPIRE-IST-COLD-FUNC-BSM-05B-R.tcl	—	—	—	
3	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.14 Procedure SPIRE-IST-COLD-FUNC-BSM-06-R

Version	2.4
Date	6th December 2007
Purpose	BSM (REDUNDANT) Closed Loop Operational Mode Chop Test
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. BSM Chop/Jiggle sensors are ON. BSM is in closed loop.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • CHOP PARAMETERS and JIGGLE PARAMETERS displays are selected on the CCS
Duration	5 minutes
Pass/Fail criteria	The BSM Chops between the commanded positions

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-BSM-06-R.tcl	CHOPLOOPMODE JIGGLOOPMODE	1/1/1 1/1/1		
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.15 Procedure SPIRE-IST-COLD-BSM-OFF-R

Version	2.4
Date	6th December 2007
Purpose	BSM (REDUNDANT) Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. BSM Chop/Jiggle sensors are ON.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. BSM Chop/Jiggle sensors are OFF.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	HK Parameters CHOPSENSPWR and JIGGSENSPWR show expected OFF values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-BSM-OFF-R.tcl	—	—	—	
2	Check that the power to the BSM sensors is switched off	CHOPSENSPWR JIGGSENSPWR	1/-/0 1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.16 Procedure SPIRE-IST-COLD-FUNC-SMEC-01-R

Version	2.4
Date	6th December 2007
Purpose	SMEC (REDUNDANT) Encoder/LVDT Sensor Check.
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	HK Parameters SMECENCPWR and SMECLVDTPWR show expected ON values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-01-R.tcl	—	—	—	
2	Check that power to the SMEC LED and LVDT sensor is on	SMECENCPWR SMECLVDTPWR	0/-/3 0/-/1		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.17 Procedure SPIRE-IST-COLD-FUNC-SMEC-03-R

Version	2.4
Date	6th December 2007
Purpose	SMEC (REDUNDANT) Encoder Integrity Check.
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	MCUENGSMECENCSIG1/2 increase as the encoder power is increased

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-03-R.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.18 Procedure SPIRE-IST-COLD-SMEC-OFF-R

Version	2.4
Date	6th December 2007
Purpose	SMEC (REDUNDANT) Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are OFF.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	HK Parameters SMECENCPWR and SMECLVDTPWR show expected OFF values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-SMEC-OFF-R.tcl	—	—	—	
2	Check that the power to the SMEC sensors is switched off	SMECENCPWR SMECLVDTPWR	3/-/0 1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.19 Procedure SPIRE-IST-COLD-FUNC-DCU-02-R

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	Cryostat Check Procedure for CFT						
2	**Prior to performing next step verify that Level 3 temperature is between 5K and 50K (sensors T246 & T247)**	OK					
3	Record Temperatures: T246: (KD223302 if connected to CCU) T247: (KD223303 if connected to CCU)	 >5K - <50K >5K - <50K					
	End of Cryostat Check						

Version	2.4
Date	6th December 2007
Purpose	DCU Nominal Science Contents Check REDUNDANT
Initial configuration	SPIRE DPU and DRCU REDUNDANT are switched ON, SPIRE HK is being produced and MCU is booted.
Final configuration	Unchanged
Preconditions	• **SPIRE-IST-COLD-DPU-ON-R** and **SPIRE-IST-COLD-DRCU-ON-R** procedures have been executed. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • I-EGSE is up and running • DCU PARAMETERS display is selected on the CCS • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	DCU HK parameters increment as expected

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter	Expected Values Before/ After	Actual Values Before /After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-02-R.tcl	DCUFRAMECNT	n/n+700		
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.20 Procedure SPIRE-IST-COLD-FUNC-DCU-11-PHOT-R

Version	2.4
Date	6th December 2007
Purpose	Photometer BDAs switch ON check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and Photometer BDAs are ON.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	7 minutes
Pass/Fail criteria	DCU HK parameters show expected values

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-11-PHOT-R.tcl	—	—	—	
2	Check that the Photometer detectors and LIAs are switched on	PSWJFETSTAT PMLWJFETSTAT PLIABITSTAT PLIAP5V PLIAP9V PLIAM9V	0/-/0x3F 0/-/0x7F 1 ~0/ ~+5.19 ± 0.1V ~0/ ~+11.54 ± 0.1V ~0/ ~-11.53 ± 0.1V		
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.21 Procedure SPIRE-IST-COLD-FUNC-DCU-13-PHOT-R

Version	2.4
Date	6th December 2007
Purpose	Photometer BDAs integrity check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and Photometer BDAs are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	15 minutes
Pass/Fail criteria	DCU HK parameters show expected values

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Check that Photometer LIAs and detectors are switched on	PLIABITSTAT PSWJFETSTAT PMLWJFETSTAT	1 0x3F 0x7F		
2	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-13-PHOT-R.tcl	—	—	—	
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.22 Procedure SPIRE-IST-COLD-FUNC-DCU-14-PHOT-R

Version	2.4
Date	6th December 2007
Purpose	Photometer BDAs noise level check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and Photometer BDAs are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Photometer BDA signals show no excess noise

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Check that Photometer LIAs and detectors are switched on	PLIABITSTAT PSWJFETSTAT PMLWJFETSTAT	1 0x3F 0x7F		
2	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-14-PHOT-R.tcl	—	—	—	
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.23 Procedure SPIRE-IST-COLD -PHOT-VSS-R

Version	1.1
Date	10th July 2008
Purpose	Photometer BDAs Vss Test REDUNDANT
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and Photometer BDAs are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	40 minutes
Pass/Fail criteria	Photometer BDA Vss values are optimised

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Check that Photometer LIAs and detectors are switched on	PLIABITSTAT PSWJFETSTAT PMLWJFETSTAT	1 0x3F 0x7F		
2	Execute TCL script SPIRE-IST-COLD -PHOT-VSS-R.tcl	—	—	—	
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.24 Procedure SPIRE-IST-COLD-PDET-OFF-R

Version	2.4
Date	6th December 2007
Purpose	Photometer BDAs Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and Photometer BDAs are ON
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and Photometer BDAs are OFF
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	DCU HK parameters show expected values

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-PDET-OFF-R.tcl	—	—	—	
2	Check that the Photometer detectors are switched off	PSWJFETSTAT PMLWJFETSTAT	0x3F/-/0 0x7F/-/0		
3	Check that the Photometer LIAs are switched off	PLIABITSTAT	1/-/0		
4	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.25 Procedure SPIRE-IST-COLD-FUNC-DCU-11-SPEC-R

Version	2.4
Date	6th December 2007
Purpose	Spectrometer BDAs switch ON check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and Spectrometer BDAs are ON.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	7 minutes
Pass/Fail criteria	DCU HK parameters show expected values

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-11-SPEC-R.tcl	—	—	—	
2	Check that the Spectrometer detectors and LIAs are switched on	SPECJFETSTAT SLIABITSTAT SLIAP5V SLIAP9V SLIAM9V	0/-/7 1 ~0/ ~+5.23 ± 0.1 ~0/ ~+11.57 ± 0.1 ~0/ ~-11.54 ± 0.1		
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.26 Procedure SPIRE-IST-COLD-FUNC-DCU-13-SPEC-R

Version	2.4
Date	6th December 2007
Purpose	Spectrometer BDAs integrity check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and Spectrometer BDAs are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	12 minutes
Pass/Fail criteria	DCU HK parameters show expected values

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Check that the Spectrometer detectors and LIAs are switched on	SPECJFETSTAT SLIABITSTAT	7 1		
2	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-13-SPEC-R.tcl	—	—	—	
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.27 Procedure SPIRE-IST-COLD-FUNC-DCU-14-SPEC-R

Version	2.4
Date	6th December 2007
Purpose	Spectrometer BDAs noise check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and Spectrometer BDAs are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Spectrometer BDA signals show no excess noise

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Check that the Spectrometer detectors and LIAs are switched on	SPECJFETSTAT SLIABITSTAT	7 1		
2	Execute TCL script SPIRE-IST-COLD-FUNC-DCU-14-SPEC-R.tcl	—	—	—	
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.28 Procedure SPIRE-IST-COLD- SPEC-VSS-R

Version	1.1
Date	10th July 2008
Purpose	Spectrometer BDAs Vss Test REDUNDANT
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and Spectrometer BDAs are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	40 minutes
Pass/Fail criteria	Spectrometer BDA Vss values are optimised

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Check that the Spectrometer detectors and LIAs are switched on	SPECJFETSTAT SLIABITSTAT	7 1		
2	Execute TCL script SPIRE-IST-COLD-SPEC-VSS-R.tcl	—	—	—	
3	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.29 Procedure SPIRE-IST-COLD-SDET-OFF-R

Version	2.4
Date	6th December 2007
Purpose	Spectrometer BDAs Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and Spectrometer BDAs are ON
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and Spectrometer BDAs are OFF
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	DCU HK parameters show expected values

Procedure Steps:

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-SDET-OFF-R.tcl	—	—		
2	Check that the Spectrometer detectors are switched off	SPECJFETSTAT	7/-/0		
3	Check that the Spectrometer LIAs are switched off	SLIABITSTAT	1/-/0		
4	Wait for the I-EGSE staff to confirm the success or failure of this test	—	—	—	
Test Result (Pass/Fail):					

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	Cryostat Check Procedure for CFT						
5	Record Temperatures: T246: (KD223302 if connected to CCU) T247: (KD223303 if connected to CCU)	 >5K - <50K >5K - <50K					
6	**Inform Cryo Engineers that Level 3 temperature no longer needs to be maintained between 5K and 50K**	OK					
	End of Cryostat Check						

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.30 Procedure SPIRE-IST-COLD-MCU-OFF-R

Version	2.4
Date	6th December 2007
Purpose	MCU REDUNDANT Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is OFF.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is ON. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified MCU HK Parameter shows expected value.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-MCU-OFF-R.tcl	—	—	—	
2	Check that the MCU is switched off	MCUBITSTAT	1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.31 Procedure SPIRE-IST-COLD-SCU-OFF-R

Version	2.4
Date	6th December 2007
Purpose	SCU REDUNDANT Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is OFF
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified SCU HK Parameters show expected value.

Procedure Steps:

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-SCU-OFF-R.tcl	—	—	—	
2	A few seconds later record the value of parameter SCUTEMPSTAT	SCUTEMPSTAT	0xFFFF/-/0		
3	A few seconds later record the value of parameter SUBKSTAT	SUBKSTAT	1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.3.32 Switch OFF SPIRE REDUNDANT

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
1.	From the HPCCS test conductor console start the test script to power OFF SPIRE REDUNDANT: **S102999SCVT034_ASDCFTSPIR_PWR_OFF_R**	OK				
2.	On HPCCS when prompted: ~~-~~SPIRE Switch OFF for CFT related tests in Hel/Hell conditions only - Select NO to abort TS if not correct" **Select YES**	YES				
	If **YES** is selected the test script will go on to automatically power off all SPIRE warm units.					

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	Note: During Switch OFF of SPIRE, the following (5,1) and (5,4) event messages on APID 1281 may be expected and do not indicate a problem: c) EVID 1313 No_MCU_Response_Error d) EVID 21773 ALARM_LSMCU_DEAD **However, be aware that if FDIR is enabled for SPIRE in the CDMU then this may trigger an OBCP**					
3.	On HPCCS when prompted: "Check Telemetry No Longer Updating - OK to continue" Check that parameters: THSK TM2N	 Not refreshing Not incrementing		**AND: SA_1_559**		
4.	Select OK to continue	OK				

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
5.	On HPCCS when all autonomous actions have been completed by the power on script **S102999SCVT034_ASDCFTSPIR_PWR_OFF_R** it will prompt: ~~-~~Bus profile left as SPIRE PRIME, change manually after if required - OK to continue"					
6.	Select OK to continue	OK				
7.	On HPCCS stop Packet History displays for the following APIDs:1281,1283	OK				
	SPIRE REDUNDANT OFF					

Enter Start Date|Time:			

7.2.4 Satellite & EGSE Switch Off After CFT Tests

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	Satellite & EGSE Switch Off						
	Initial Conditions: Nominal & Redundant SPIRE warm units OFF						
1	On HPCSS terminate **SPIRE_ALL_SubscribeParams.tcl** test script.	OK					
2	From HPCCS Test Conductor console issue command to disconnect from SPIRE I-EGSE **disconnect HSPIREEGSE**	OK					
3	Confirm from HPCSS and SPIRE I-EGSE that the disconnection was successful	YZS29940= DISCONNECTED			**AND SYS_PARS**		
4	If no longer required switch OFF I-EGSE i.a.w. AD 5	OK					
5	Stop monitoring CryoSCOE data on the CCS by selecting Stop Record & Exit from the following script: **K102999ECVT035_ASDGEN_SCOE_CCU_LOG**	OK					
6a	If test is perform as part of SPIRE IST Commissioning then switch off S/C, HPCCS and SCOEs i.a.w. procedure AD12 Section 7.4 continuing from step 42, then return to lead procedure AD10 section 7.4 to complete the switch-off	OK					
6b	If test is to be performed as a standalone CFT then switch off S/C and if required downlink packet stores i.a.w. AD2 section 7.7	OK					
7	Confirm both Satellite and EGSE powered down	OK					
8	Stop the instrument temperature logging by terminating script:	OK					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	Z102999SCVT025_ASDGEN_INSTTEMP_LOG						
	End Conditions: Satellite and EGSE OFF						
	END OF SPIRE CFT TEST						

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.5 EGSE & Satellite Switch On for SMEC Tests

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	Satellite & EGSE Switch On						
0	Confirm all constraints for the SMEC Test as defined in Section 1 have been fulfilled prior to starting the test	OK					
1	Confirm I-EGSE physically connected to HPCCS	OK					
2	Switch on & configure SPIRE I-EGSE i.a.w. **AD5 & AD 8**	OK					
3	Confirm SPIRE I-EGSE is in the correct configuration as per AD5 & AD 8 and TIME synchronised with HPCCS	OK					
4	Switch on HPCCS, SCOEs and Satellite/SVM and configure into Basic Test Mode i.a.w. AD 2 Section 7.1 to 7.5.	OK					
5	Confirm that EGSE and Satellite are in the correct configuration as per AD 2	OK					
6	If not already on, from HPCCS power ON CCU A & CCU B by executing test script: **K102999ECVT001_ASDGENCCU_ABPWRON**	OK					
7	If not already enabled, from HPCCS enable Monitoring Mode 1 (512sec cycle) for CCU A & B by executing test script: **K102999ECVT001_ASDGENCCU_MnEBOTH1**	OK					
8	Connect HPCCS to CRYOSCOE and verify CryoSCOE data is being received on the CCS by executing the following script: **K102999ECVT035_ASDGEN_SCOE_CCU_LOG**	OK					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
9	From HPCCS Test Conductor console issue command to connect to SPIRE I-EGSE **connect HSPIREEGSE**	OK					
10	Confirm from HPCCS and SPIRE I-EGSE that the connection has been established	YZS29940= CONNECTED			**AND SYS_PARS**		
11	Verify that I-EGSE is receiving CCU Cryo packets	OK					
12	On HPCCS start the following test script: **ALL_SubscribeParams.tcl**	OK					
13	Verify HPCCS-IEGSE connection by sending test command: **YC00X966** From the manual command stack (repeater value of ~~0~~")	OK					
14	If required load Synoptics INSTRUMENTS on HPCCS to display SPIRE status overview						
	READY FOR START OF SPIRE SMEC TESTS						

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6 SMEC Tests

7.2.6.1 Verify Nominal Latch Command Relay Status

Verify launch lock relays are positioned to allow SMEC launch lock to be unlatched.

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	All TCs to be sent from the Manual Command Stack					
1.	*Send **DC904180** and verify from the resulting (14,4) packet that packet 120 (dec) is not already enabled (i.e. NOT present in the list). If present skip steps 2 – 4*	120 not present		Step 1 to 5 only required on CDMS ASW 3.4		
2.	*Send **ZCB00999** to allocate new diagnostic packet*	OK				
3.	*Send **DC900180** with repeater value 1 and parameters: DH019180 = 26, DH020180=120*	OK				
4.	*Send **DC904180** and verify from the resulting (14,4) packet that packet 120 (dec) is nowenabled (i.e. present in the list)*	120 present				
5.	*From TMPH verify that packets with SPID = **264000999** are cyclically arriving on the CCS*	Packets Arriving				
6.	Close LCL25, by sending **DC25D170**	OK		State of LCL #25 switches to ON		
7.	Verify LCL25 closed: **WM12B565 =**	ON				
8.	Record Current **WM107565**	N/A				

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
9.	Send HLC 5 to switch relays to LCL position **DCT01170, DHT01170=”CMD_ID_HLC5”**	OK				
10.	Verify Current **WM107565 =**	130-180 mA		Current between 130-180mA		
11.	Send HLC 6 to switch relays to MCU position **DCT01170, DHT01170=”CMD_ID_HLC6”**	OK				
12.	Verify Current **WM107565 =**	0 mA		Current off		
13.	Open LCL25, by sending **DC25B170**	OK		State of LCL #25 switches to OFF		
14.	Verify LCL25 open: **WM12B565 =**	OFF				
	SMEC Nominal LL latch relay position verification complete					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.2 Switch ON for SPIRE PRIME SMEC

The following will switch ON and configure SPIRE Prime instrument in REDY (Standby) mode. HKTM packets will be generated on APIDs 1280 dec and 1282 decimal (these can be observed using TMPH with corresponding filter – note however a limited number of TMPHs should be running at one time).

During power on of SPIRE a number of soft/hard OOLs are reported due to the sequential switch on of the units. This is expected and will clear when SPIRE is in REDY mode. When in REDY mode one parameter remains OOL (soft) namely SMD2V505 this is also expected.

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
1.	On HPCCS start Packet History displays for the following APIDs:1280,1282	OK				
2.	From the HPCCS test conductor console start the test script to power on SPIRE Prime: **S102999SCVT031_ASDCFTSPIR_PWR_ON_P**	OK		AND: ZAD07999, ZAD14999 MIM: LCL_HERSCHEL		

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
3.	On HPCCS when prompted: "~~S~~PIRE Switch ON for Cold FT related tests in Hel/Hell conditions only - Select NO to abort TS if not correct" **Select YES**	YES				
	If **YES** is selected the test script will go on to automatically power on all SPIRE warm units, force boot the DPU ASW and configure the instrument to Standby mode. Reply to prompts as indicated below.					
4.	On HPCCS when prompted: "Check Telemetry Updating Correctly and OBT is Consistent with CDMU - OK to continue" Select OK	OK		**AND: SA_1_559**		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
5.	If I-EGSE connected when prompted on HPCCS, perform check requested then select **OK**: `"Check IEGSE Time Consistent - OK to continue when RAL confirm"`	OK				
6.	On HPCCS when prompted: `"Check Telemetry No Longer Updating - OK to continue"` Check that parameters: THSK TM2N Select OK to continue	 Not refreshing Not incrementing OK		Note: Two TC failures on SCR00500 are expected because HKTM has been stopped		
7.	On HPCCS when prompted: `"Check Telemetry Updating Correctly - OK to continue"` Check that parameters: THSK TM2N	 Refreshing @ 1Hz Incrementing by 1 @ 1Hz		**AND: SA_1_559**		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	Select OK to continue	OK				
8.	On HPCCS when all autonomous actions have been completed by the power on script **S102999SCVT031_ASDCFTSPIR_PWR_ON_P** it will prompt: ~~-~~Set Bus Profile Back to Original Setting?" Select NO	NO				
9.	At the prompt: "Bus Profile left unchanged" Select OK to continue	OK				
10.	Verify HK TM packets are being received on APIDs 1280 & 1282	OK				
	SPIRE DPU & DRCU powered					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.3 Procedure SPIRE-IST-COLD-FUNC-SCU-03-P

Version	2.4
Date	6th December 2007
Purpose	SCU DC thermometry check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and DC thermometry is ON
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	8 minutes
Pass/Fail Criteria	SCU DC thermometry channels show temperature readings according to the actual instrument temperature

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCU-03-P.tcl	—	—	—	
2	**Wait for the parameter BBFULLTYPE to get set to**	—	—	—	

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
	SCU_DC_Therm				
3	A few seconds later record the value of parameter SCUTEMPSTAT	SCUTEMPSTAT	0/0xFFFF/0xFFFF		
4	If the instrument is at He I temperatures check the values of SCU DC thermometry channels.	 PUMPHTRTEMP PUMPHSTEMP EVAPHSTEMP SHUNTTEMP EMCFILTEMP SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP BSMTEMP	(All Values TBC) ~4.2K ~4.4K ~4.3K ~4.2K ~4.8K ~4.2K ~4.2K ~4.8K ~4.8K ~4.7K ~4.8K ~4.8K ~4.8K ~4.7K ~4.7K ~4.8K		
5	If the instrument is at He II		(All Values TBC)		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
	temperatures check the values of SCU DC thermometry channels.	PUMPHTRTEMP PUMPHSTEMP EVAPHSTEMP SHUNTTEMP EMCFILTEMP SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP BSMTEMP	-/~4.6K -/~3.0K -/~3.0K -/~1.7K -/~4.6K -/~1.7K -/~1.7K -/~4.6K -/~4.6K -/~4.5K -/~4.6K -/~4.6K -/~4.6K -/~4.6K -/~4.6K -/~4.5K		
6	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.4 Procedure SPIRE-IST-COLD-FUNC-SCU-06-P

Version	2.4
Date	6th December 2007
Purpose	SCU AC thermometry check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and DC thermometry is ON
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Constraints	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail Criteria	SCU AC thermometry channel shows temperature readings according to the actual instrument temperature

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCU-06-P.tcl	—	—	—	
2	**Wait for the parameter BBFULLTYPE to get set to SCU_AC_Therm**	—	—	—	
3	A few seconds later record the value of parameter SUBKSTAT	SUBKSTAT	0/1/1		
4	If the instrument is at He I temperatures check the value of SCU AC thermometry channel.	SUBKTEMP	~4K		
5	If the instrument is at He II temperatures check the value of SCU AC thermometry channel.	SUBKTEMP	~1.7K		
6	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.5 Procedure SPIRE-IST-COLD-FUNC-MCU-01-P

Version	2.4
Date	6th December 2007
Purpose	MCU (PRIME) Boot Check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	MCU voltages and board temperatures show expected _ON‘ values

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-MCU-01-P.tcl	—	—	—	
2	Check that the MCU is booted up successfully	MCUBITSTAT	0/1/1		
3	Check MCU HK parameter values and ensure that the values are refreshing	MCUP5V MCUP14V MCUM14V MCUP15V MCUM15V MCUMACTEMP MCUSMECTEMP MCUBSMTEMP	~ 5.0 ± 0.2V ~ 14.0 ± 0.5V ~ -14.0 ± 0.5V ~ 15.0 ± 0.5V ~ -15.0 ± 0.5V ~300K ~300K ~300K		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.6 Procedure SPIRE-IST-COLD-FUNC-MCU-03-P

Version	2.4
Date	6th December 2007
Purpose	MCU Nominal Science Contents Check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	Unchanged.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified MCU HK parameters show expected increment

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-MCU-03-P.tcl	MCUFRAMECNT	0/-/297		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.7 Procedure SPIRE-IST-COLD-FUNC-SMEC-01-P

Version	2.4
Date	6th December 2007
Purpose	SMEC (PRIME) Encoder/LVDT Sensor Check.
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	HK Parameters SMECENCPWR and SMECLVDTPWR show expected ON values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-01-P.tcl	—	—	—	
2	Check that power to the SMEC LED and LVDT sensor is on	SMECENCPWR SMECLVDTPWR	0/-/1 0/-/1		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.8 Procedure SPIRE-IST-COLD-FUNC-SMEC-03-P

Version	2.4
Date	6th December 2007
Purpose	SMEC (PRIME) Encoder Integrity Check.
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	MCUENGSMECENCSIG1/2 increase as the encoder power is increased

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-03-P.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.9 Procedure SPIRE-IST-COLD-FUNC-SMEC-02A-P

Version	2.5
Date	3rd July 2008
Purpose	Open the SMEC Launch Latch Prime (Unlatch it)
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and SMEC is latched
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and SMEC is ON and Unlatched
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	20 minutes
Pass/Fail criteria	The SMEC latch is open.

Procedure Steps:

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-02A-P.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test** **The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.10 Procedure SPIRE-IST-COLD-FUNC-SMEC-FFOFFSET-P

Version	1.2
Date	10th July 2008
Purpose	SMEC (PRIME) Open Loop Feed Forward Offset Test
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SMEC PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	60 minutes
Pass/Fail criteria	Optimum SMEC Feed Forward Offset is determined

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-FFOFFSET-P.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
3	Based on the results of this test it may be necessary to set the SMEC FF Offset manually. **SPIRE_SEND_DRCU_COMMAND** • **param 1 = 0x9055xxxx** • **param 2 = 0** **I-EGSE staff will supply the 16-bit parameter value xxxx to this command.**	SMECFFOFFSET	-/ - /xxxx		
4	Based on the results of this test it may be necessary to set the SMEC FF Gain manually. **SPIRE_SEND_DRCU_COMMAND** • **param 1 = 0x9054xxxx** • **param 2 = 0** **I-EGSE staff will supply the 16-bit parameter value xxxx to this command.**	SMECFFGAIN	-/ - /xxxx		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
5	A manual reset of the encoder signals 1 and 2 offsets may be required. If this is the case Two MANUAL commands will be required to be sent from the CCS: **SPIRE_SEND_DRCU_COMMAND** • **param 1 = 0x9058xxxx** • **param 2 = 0** **SPIRE_SEND_DRCU_COMMAND** • **param 1 = 0x905Axxxx** • **param 2 = 0** **The 16 bit parameters xxxx will be provided by I-EGSE staff**	SMECENCSIG1OFF SMECENCSIG2OFF	-/-/~ Commanded Value -/-/~ Commanded Value		
6	**Note that it may be necessary to repeat this test to fine tune the Feed Forward Offset** **The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.11 Procedure SPIRE-IST-COLD-FUNC-SMEC-04A-P

Version	2.5
Date	3rd July 2008
Purpose	SMEC (PRIME) Open Loop Positioning Test.
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	30 minutes
Pass/Fail criteria	SMEC moves to the commanded positions

Procedure Steps:

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-04A-P.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test** **The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.12 Procedure SPIRE-IST-COLD-FUNC-SMEC-09-P

Version	2.5
Date	3rd July 2008
Purpose	SMEC (PRIME) Open Loop Scan Test.
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • SMEC PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	30 minutes
Pass/Fail criteria	SMEC performs a scan between the commanded positions

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	A manual reset of the encoder signals 1 and 2 offsets may be required. If this is the case Two MANUAL commands will be required to be sent from the CCS: **SPIRE_SEND_DRCU_COMMAND** • **param 1 = 0x9058xxxx** • **param 2 = 0** **SPIRE_SEND_DRCU_COMMAND** • **param 1 = 0x905Axxxx** • **param 2 = 0** **The 16 bit parameters xxxx will be provided by I-EGSE staff**	SMECENCSIG1OFF SMECENCSIG2OFF	-/-/~ Commanded Value -/-/~ Commanded Value		
2	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-09-P.tcl	—	—	—	
3	**Wait for the I-EGSE staff to confirm the success or failure of this test** **The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.13 Procedure SPIRE-IST-COLD-FUNC-SMEC-07-P

Version	2.5
Date	3rd July 2008
Purpose	SMEC (PRIME) Close Loop Scan Test.
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON.
Final configuration	SMEC is in closed loop
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	60 minutes
Pass/Fail criteria	SMEC performs a scan between the commanded positions and the loop remains closed

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	**Before this test a SMEC calibration table on the I-EGSE may have to be changed. Please confirm with the I-EGSE staff before continuing with the next test.**	—	—	—	
2	Execute TCL script SPIRE-IST-COLD-SMEC-INIT-P.tcl	SMECLOOPMODE	6/-/1		
3	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-07-P.tcl	—	—	—	
4	**Wait for the I-EGSE staff to confirm the success or failure of this test The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.14 Procedure SPIRE-IST-COLD-FUNC-SMEC-04B-P

Version	2.5
Date	3rd July 2008
Purpose	SMEC (PRIME) Close Loop Positioning Test.
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON. SMEC is in closed loop.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	20 minutes
Pass/Fail criteria	SMEC moves to the commanded positions and remains in closed loop

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-04B-P.tcl	SMECLOOPMODE	1/1/1		
2	**Wait for the I-EGSE staff to confirm the success or failure of this test** **The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.15 Procedure SPIRE-IST-COLD-FUNC-SMEC-LVDT-P

Version	1.1
Date	10th July 2008
Purpose	SMEC (PRIME) Backup LVDT Close Loop Check
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON. SMEC is in closed loop.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	90 minutes
Pass/Fail criteria	SMEC remains in closed loop on LVDT

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	**Manual commanding may be necessary during this test. Details to be specified** **Change downlink data rate to 1.5 Mbps** **Send command** **DC27F170**	—	—	—	

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
2	**Wait for the I-EGSE staff to confirm the success or failure of this test.** **The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.16 SMEC Microvibration Pre-Test Configuration

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	ACMS Switch ON						
1	From Test Conductor Console, execute script: _A102109SPVT003_ACMS_CONFIG25‘	OK					
2	At the following main menu: HERSCHEL/PLANCK - MAIN MENU 1.0 - INIT PHASE ========== **1. Select/Load ACMS_CONFIG Input File** 2. Perform LAUNCH CONFIGURATION 3. On Board SW Updates 4. ACMS Power ON (in Pre-Sep configuration) 5. Modify ACC SGM/RM CONTENT (Enter sub-menu 1.1) 6. ACMS SCOE Configuration 77. JUMP to another Entry Point 88. Continue ACMS_CONFIG to menu 2.0 STBY/PRE-SEP 99. Terminate ACMS_CONFIG	Select option 1 and click OK then Continue					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	select the point number 1 and press the relevant button:—CONTINUE".						
3	Sequence pops-up asking for the input file. Write SPIRE_UV and press OK	Write —SPIRE_UV" and press OK					
4	At sequence completion, the same main menu appears. *Select point number 6* **to switch on the ACMS SCOE then click OK, Continue**	Select Option 6 and click OK, Continue			ACMS SCOE is switched-on in executing' mode. Note: Until ACC is not fully powered-on, some WARNING ALARMS might come down in the On-Board Event History.		
5	On AND YA001939 AMCS SCOE - AS_PSEUDO 1 of 1' check that parameters: YMACT939 (ACMS SCOE state) YMASE939 (Simulator stata) YMAMS939 (MILFE state) YMAUS939 (UIFE state) Turned to: executing'	Parameters set to executing'					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
6	At sequence completion, the same main menu appears. *Select point number 4* **to switch on the ACC then click OK, Continue**	Select Option 4 and click OK, Continue			Expected Out of Limit of AEYYY109 (synchronisation). ACC may become INVALID for a short time. SPR 245: Out of Limit of HKA_ANTHx_Data		
7	From a Packet History tool, select filter „APID 512" and check that ACMS HK and ETM is correctly flowing down.	OK					
8	From On-Board Event History Display check that no „NO-GO" are present.	OK					
9	From ACMS MASTER (ACMS_CONFIG25) sequence, move to Menu 3 (if not already there) with option 88. Click OK and then Confirm	OK					
10	From ACMS_CONFIG25, Menu 3, select option 1: „Override Separation Flag" then Click button OK and then Confirm	Select 1, then OK and Continue			ACC goes in SAM Mode		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
11	Sequence A102109SPVT034_ACMS_SAM_MON shall pop-up following the opening of separation straps, at prompt: _Do you want to continue to monitor Sam Sun Pointing mode ? Enter your choice: no Then click OK	no			ACMS SAM Point Coarse is reached		
12	From ACMS_CONFIG25 Master Sequence, Menu 4.0, select option 6 _Transition to OCM' **Click OK and then Confirm**	Select 6, then OK and Continue					
13	Sequence _A102109SPVT036_ACMS_STR_ON' shall pop-up. At prompt: _Do You want to change current Str in Use' check if STR already selected is the correct one and answer **'no'**	no			STR-1 is switched ON and put in ATFAD mode		
14	When scripts are completed, From ACMS synoptic check that ACC Mode is turned to: _OCM pnt fine'	OK					
	Synchronise CCS Time With ETS for Accelerometer Measurement Timing						

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
15	For correlation of test results, record time of ETS Accelerometer Test Equipment and at the same time record the CCS time:						
	ETS Time (Accelerometer Measurement T.E. Clock):						
	CCS Time:						
16	If not already active request ETS to start accelerometer acquisitions as per Appendix 2						

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.17 Reaction Wheel Operation for Variable Frequency Microvibration

This section should be performed in parallel with section 7.2.6.18 step 2. It takes approximately 40 mins to run.

Step	Reaction Wheel Activation	Nominal Value	Tolerance	Actual Value	Remark	P	N
1	From Test Conductor Console, execute script: _A102109SPVT213_ACMS_RWL_SPIRE_uVIB‘	OK					
2	Setup the _TM Plotting Tool‘ to follow RWL spinning for the followiing monitoring parameters: AEWR1002 AEWR2002 AEWR3002 AEWR4002	OK					
3	At the following prompt: _Positive Spin. Click OK‘ Check from ACMS Synoptic that RWL 1-2-3-4 are ON. Then Click OK to start positive spinning	Click OK					
	On the _TM Plotting Tool‘ follow RWL positive spinning						
4	At the following prompt: _Negative Spin. Click OK‘ Click OK to start negative spinning	Click OK					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Reaction Wheel Activation	Nominal Value	Tolerance	Actual Value	Remark	P	N
	On the _TM Plotting Tool' follow RWL negative spinning						
6	At the following prompt: _Click OK to spin-down RWL to 0 [Nms]' Click OK to bring RWLs to 0 [Nms]	Click OK					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.18 SMEC Variable Frequency Microvibration Test

The previous section (7.2.6.17) must be performed in parallel with this section step 2, which is assumed to take around 40 mins to run. Make sure that for this micro-vibration test the accelerometer acquisition has been activated before continuing.

Step	Description	Parameters	Expected Values	Actual Values	Success/ Failure
1	Execute stand alone script SPIRE-IST-SMEC-RAMP-MICROVIBRATION.tcl Generate high rate MCU engineering data – we are looking for fluctuations in SMEC velocity Set SMEC continuously scanning at 0.5 mm/s (TBC) over full range Number of scans set to make this a 1 hour test **An ABORT TEST pop up should visibe on the operator screen – only press if advised by I-EGSE staff.**	N/A	N/A	N/A	
	When given the go-ahead from SPIRE I-EGSE Operator, perform the following step				
2	Perform Section 7.2.6.17 to start reaction wheel operation i.a.w. agreed profile (see Appendix 2)	N/A	N/A	N/A	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.19 Reaction Wheel Operation for Spot Frequency Microvibration

This section should be performed in parallel with section 7.2.6.20 step 3. It takes approximately 40 mins to run.

Step	Reaction Wheel Activation	Nominal Value	Tolerance	Actual Value	Remark	P	N
1	From Test Conductor Console, execute script: ‗A102109SPVT213_ACMS_RWL_SPIRE_uVIB‘	OK					
2	Setup the ‗TM Plotting Tool‘ to follow RWL spinning for the followiing monitoring parameters: AEWR1002 AEWR2002 AEWR3002 AEWR4002	OK					
3	At the following prompt: ‗Positive Spin. Click OK‘ Check from ACMS Synoptic that RWL 1-2-3-4 are ON. Then Click OK to start positive spinning	Click OK					
	On the ‗TM Plotting Tool‘ follow RWL positive spinning						
4	At the following prompt: ‗Negative Spin. Click OK‘ Click OK to start negative spinning	Click OK					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

~~Step~~	~~Reaction Wheel Activation~~	~~Nominal Value~~	~~Tolerance~~	~~Actual Value~~	~~Remark~~	~~P~~	~~N~~
	~~On the „TM Plotting Tool“ follow RWL negative spinning~~						
~~6~~	~~At the following prompt:~~ ~~„Click OK to spin-down RWL to 0 [Nms]“~~ ~~Click OK to bring RWLs to 0 [Nms]~~	~~Click OK~~					

Enter Start Date|Time:			

~~7.2.6.20 SMEC Spot Frequency Microvibration Test~~

~~The previous section (7.2.6.17) must be performed in parallel with this section step 3, which is assumed to take around 40 mins to run. Make sure that for this micro-vibration test the accelerometer acquisition has been activated before continuing.~~

~~Step~~	~~Description~~	~~Parameters~~	~~Expected Values~~	~~Actual Values~~	~~Success/ Failure~~
~~1~~	~~On HPCCS execute test script SPIRE-IST-SMEC-SPOT-MICROVIBRATION~~ ~~Generate high rate data – we are looking for fluctuations in SMEC velocity~~ ~~Scan SMEC at 0.1 mm/s over full range for four scans~~	~~N/A~~	~~N/A~~	~~N/A~~	
	~~**The following 2 steps shall be run in parallel**~~				
~~2~~	~~Perform Section 7.2.6.17 to start reaction wheel operation i.a.w. agreed profile (see Appendix 2)~~	~~N/A~~	~~N/A~~	~~N/A~~	
~~3~~	~~On HPCCS execute test script SPIRE-IST-SMEC-SPOT-MICROVIBRATION~~ ~~Generate high rate data – we are looking for fluctuations in SMEC velocity~~ ~~Scan SMEC at 0.1 mm/s over full range for four scans~~	~~N/A~~	~~N/A~~	~~N/A~~	
~~**Test Result (Pass/Fail):**~~					

Enter Start Date|Time:			

7.2.6.21 Microvibration Post-Test Configuration

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
	ACMS Switch OFF						
7.5.5.12.1	Ensure RWLs have spun down before switching OFF						
7.5.5.12.2	From ACMS_CONFIG25 main menu: • **Select the point number 99** and confirm the selection pressing the relevant button —CONTINUE”.	Continue					
7.5.5.12.3	The following menu will appear: HERSCHEL/PLANCK - MAIN MENU 9.0 - ACMS OFF PHASE ========== ***select the point number 1*** _Switch Off ACMS‘ and confirm the selection pressing the relevant button —CONTINUE”.	Continue					
7.5.5.12.4	Check the —ACMS_OFF” Test Sequence has been successfully ended.	OK					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value	Remarks	P	N
7.5.5.12.5	By the same above menu, ***select the point number 99*** to end the ACMS_CONFIG25 Master Sequence". Click OK to Confirm	OK					
	Re-Synchronise Time With ETS for Accelerometer Measurement Timing						
7.5.5.12.6	For correlation of test results re-record time of ETS Accelerometer Test Equipment and at the same time record the CCS time:						
	ETS Time (Accelerometer Measurement T.E. Clock):						
	CCS Time:						
7.5.5.12.7	Notify ETS that accelerometer acquisitions can be stopped						

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.22 Procedure SPIRE-IST-COLD-FUNC-SMEC-02B-P

Version	2.5
Date	3rd July 2008
Purpose	Close the SMEC Launch Latch (Latch it)
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and SMEC is ON and unlatched
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted and SMEC is ON and Latched
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	30 minutes
Pass/Fail criteria	The SMEC latch is closed

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-02B-P.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Enter Start Date|Time:			

7.2.6.23 Procedure SPIRE-IST-COLD-SMEC-OFF-P

Version	2.4
Date	6th December 2007
Purpose	SMEC (PRIME) Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are ON.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted. SMEC Encoder and LVDT are OFF.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is booted. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	HK Parameters SMECENCPWR and SMECLVDTPWR show expected OFF values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-SMEC-OFF-P.tcl	—	—	—	
2	Check that the power to the SMEC sensors is switched off	SMECENCPWR SMECLVDTPWR	1/-/0 1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.24 Procedure SPIRE-IST-COLD-MCU-OFF-P

Version	2.4
Date	6th December 2007
Purpose	MCU PRIME Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is booted.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU PRIME is OFF.
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MCU PRIME is ON. • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified MCU HK Parameter shows expected value.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-MCU-OFF-P.tcl	—	—	—	
2	Check that the MCU is switched off	MCUBITSTAT	1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.25 Procedure SPIRE-IST-COLD-SCU-OFF-P

Version	2.4
Date	6th December 2007
Purpose	SCU PRIME Switch OFF
Initial configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is ON.
Final configuration	SPIRE DPU and DRCU PRIME are ON and SPIRE HK is being produced and AC/DC thermometry is OFF
Preconditions	• SPIRE DRCU PRIME is switched ON • SPIRE MIB PRIME is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified SCU HK Parameters show expected value.

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-SCU-OFF-P.tcl	—	—	—	
2	A few seconds later record the value of parameter SCUTEMPSTAT	SCUTEMPSTAT	0xFFFF/-/0		
3	A few seconds later record the value of parameter SUBKSTAT	SUBKSTAT	1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.26 Switch OFF After SPIRE PRIME SMEC

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
8.	From the HPCCS test conductor console start the test script to power OFF SPIRE Prime: **S102999SCVT032_ASDCFTSPIR_PWR_OFF_P**	OK				
9.	On HPCCS when prompted: ~~-~~SPIRE Switch OFF for CFT related tests in Hel/Hell conditions only - Select NO to abort TS if not correct" **Select YES**	YES				
	If **YES** is selected the test script will go on to automatically power off all SPIRE warm units.					

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	Note that during Switch OFF of SPIRE the following (5,2) and (5,4) event messages on APID 1280 may be expected and do not indicate a problem: e) EVID 1313 No_MCU_Response_Error f) EVID 21773 ALARM_LSMCU_DEAD **However, be aware that if FDIR is enabled for SPIRE in the CDMU then this may trigger an OBCP**					
10.	On HPCCS when prompted: "Check Telemetry No Longer Updating - OK to continue" Check that parameters: THSK TM2N	 Not refreshing Not incrementing		**AND: SA_1_559**		
11.	Select OK to continue	OK				

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
12.	On HPCCS when all autonomous actions have been completed by the power on script **S102999SCVT032_ASDCFTSPIR_PWR_OFF_P** it will prompt: ~~-~~Bus profile left as SPIRE PRIME, change manually after if required - OK to continue"					
13.	Select OK to continue	OK				
14.	On HPCCS stop Packet History displays for the following APIDs:1280,1282	OK				
	SPIRE PRIME OFF					

Enter Start Date|Time:			

7.2.6.27 Verify Redundant Latch Command Relay Status

Verify launch lock relays are positioned to allow SMEC launch lock to be unlatched.

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	All TCs to be sent from the Manual Command Stack					
1.	*Send **DC904180** and verify from the resulting (14,4) packet that packet 120 (dec) is not already enabled (i.e. NOT present in the list). If present skip steps 2 – 4*	120 not present		Step 1 to 5 only required on CDMS ASW 3.4		
2.	*Send **ZCB00999** to allocate new diagnostic packet*	OK				
3.	*Send **DC900180** with repeater value 1 and parameters: DH019180 = 26, DH020180=120*	OK				
4.	*Send **DC904180** and verify from the resulting (14,4) packet that packet 120 (dec) is nowenabled (i.e. present in the list)*	120 present				
5.	*From TMPH verify that packets with SPID = **264000999** are cyclically arriving on the CCS*	Packets Arriving				
6.	Close LCL26, by sending **DC26D170**	OK		State of LCL #26 switches to ON		
7.	Verify LCL26 closed: **WMA2B565 =**	ON				
8.	Record Current **WMA07565**	N/A				
9.	Send HLC 5 to switch relays to LCL position **DCT01170, DHT01170="CMD_ID_HLC21"**	OK				

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
10.	Verify Current **WMA07565 =**	130-180 mA		Current between 130-180mA		
11.	Send HLC 6 to switch relays to MCU position **DCT01170, DHT01170="CMD_ID_HLC22"**	OK				
12.	Verify Current **WMA07565**	0 mA		Current off		
13.	Open LCL26, by sending **DC26B170**	OK		State of LCL #26 switches to OFF		
14.	Verify LCL26 open: **WMA2B565 =**	OFF				
	SMEC Redundant LL latch relay position verification complete					

Enter Start Date|Time:			

7.2.6.28 Switch ON for SPIRE REDUNDANT SMEC

The following will switch ON and configure SPIRE Redundant instrument in REDY (Standby) mode. HKTM packets will be generated on APIDs 1281 dec and 1283 decimal (these can be observed using TMPH with corresponding filter – note however a limited number of TMPHs should be running at one time).

During power on of SPIRE a number of soft/hard OOLs are reported due to the sequential switch on of the units. This is expected and will clear when SPIRE is in REDY mode. When in REDY mode one parameter remains OOL (soft) namely SMD2V505 this is also expected.

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
11.	On HPCCS start Packet History displays for the following APIDs:1281,1283	OK				
12.	From the HPCCS test conductor console start the test script to power on SPIRE Redundant: **S102999SCVT033_ASDCFTSPIR_PWR_ON_R**	OK		AND: ZAD07999, ZAD14999 MIM: LCL_HERSCHEL		

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
13.	On HPCCS when prompted: ~~-~~SPIRE Switch ON for Cold FT related tests in Hel/Hell conditions only - Select NO to abort TS if not correct" **Select YES**	YES				
	If **YES** is selected the test script will go on to automatically power on all SPIRE warm units, force boot the DPU ASW and configure the instrument to Standby mode. Reply to prompts as indicated below.					
14.	On HPCCS when prompted: "Check Telemetry Updating Correctly and OBT is Consistent with CDMU - OK to continue" **Select OK**	OK		**AND: SA_1_559**		
15.	If I-EGSE connected when prompted on HPCCS, perform check requested then select **OK**: "Check IEGSE Time Consistent - OK to continue when RAL confirm"	OK				

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
16.	On HPCCS when prompted: "Check Telemetry No Longer Updating - OK to continue" Check that parameters: THSK TM2N Select OK to continue	 Not refreshing Not incrementing OK		Note: Two TC failures on SCR00500 are expected because HKTM has been stopped		
17.	On HPCCS when prompted: "Check Telemetry Updating Correctly - OK to continue" Check that parameters: THSK TM2N Select OK to continue	 Refreshing @ 1Hz Incrementing by 1 @ 1Hz OK		**AND: SA_1_559**		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
18.	On HPCCS when all autonomous actions have been completed by the power on script **S102999SCVT033_ASDCFTSPIR_PWR_ON_R** it will prompt: ~~-~~Set Bus Profile Back to Original Setting?" Select NO	NO				
19.	At the prompt: "Bus Profile left unchanged" Select OK to continue	OK				
20.	Verify HK TM packets are being received on APIDs 1281 & 1283	OK				
	SPIRE DPU & DRCU Redundant powered					

Enter Start Date|Time:			

7.2.6.29 Procedure SPIRE-IST-COLD-FUNC-SCU-03-R

Version	2.4
Date	6th December 2007
Purpose	SCU DC thermometry check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and DC thermometry is ON
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	8 minutes
Pass/Fail Criteria	SCU DC thermometry channels show temperature readings according to the actual instrument temperature

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCU-03-R.tcl	—	—	—	
2	**Wait for the parameter BBFULLTYPE to get set to SCU_DC_Therm**	—	—	—	

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
3	A few seconds later record the value of parameter SCUTEMPSTAT	SCUTEMPSTAT	0/0xFFFF/0xFFFF		
4	If the instrument is at He I temperatures check the values of SCU DC thermometry channels.	 PUMPHTRTEMP PUMPHSTEMP EVAPHSTEMP SHUNTTEMP EMCFILTEMP SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP BSMTEMP	(All Values TBC) ~4.2K ~4.4K ~4.3K ~4.2K ~4.8K ~4.2K ~4.2K ~4.8K ~4.8K ~4.7K ~4.8K ~4.8K ~4.8K ~4.7K ~4.7K ~4.8K		
5	If the instrument is at He II temperatures check the values of	 PUMPHTRTEMP	(All Values TBC) -/~4.6K		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
	SCU DC thermometry channels.	PUMPHSTEMP EVAPHSTEMP SHUNTTEMP EMCFILTEMP SL0TEMP PL0TEMP OPTTEMP BAFTEMP BSMIFTEMP SCAL2TEMP SCAL4TEMP SCALTEMP SMECIFTEMP SMECTEMP BSMTEMP	-/~3.0K -/~3.0K -/~1.7K -/~4.6K -/~1.7K -/~1.7K -/~4.6K -/~4.6K -/~4.5K -/~4.6K -/~4.6K -/~4.6K -/~4.6K -/~4.6K -/~4.5K		
6	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.30 Procedure SPIRE-IST-COLD-FUNC-SCU-06-R

Version	2.4
Date	6th December 2007
Purpose	SCU AC thermometry check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and DC thermometry is ON
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Constraints	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	2 minutes
Pass/Fail Criteria	SCU AC thermometry channel shows temperature readings according to the actual instrument temperature

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SCU-06-R.tcl	—	—	—	
2	**Wait for the parameter BBFULLTYPE to get set to SCU_AC_Therm**	—	—	—	
3	A few seconds later record the value of parameter SUBKSTAT	SUBKSTAT	0/1/1		
4	If the instrument is at He I temperatures check the value of SCU AC thermometry channel.	SUBKTEMP	~4K		
5	If the instrument is at He II temperatures check the value of SCU AC thermometry channel.	SUBKTEMP	~1.7K		
6	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.31 Procedure SPIRE-IST-COLD-FUNC-MCU-01-R

Version	2.4
Date	6th December 2007
Purpose	MCU (REDUNDANT) Boot Check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	MCU voltages and board temperatures show expected _ON‘ values

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-MCU-01-R.tcl	—	—	—	
2	Check that the MCU is booted up successfully	MCUBITSTAT	0/1/1		
3	Check MCU HK parameter values and ensure that the values are refreshing	MCUP5V MCUP14V MCUM14V MCUP15V MCUM15V MCUMACTEMP MCUSMECTEMP MCUBSMTEMP	~ 5.0 ± 0.2V ~ 14.0 ± 0.5V ~ -14.0 ± 0.5V ~ 15.0 ± 0.5V ~ -15.0 ± 0.5V ~300K ~300K ~300K		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.32 Procedure SPIRE-IST-COLD-FUNC-MCU-03-R

Version	2.4
Date	6th December 2007
Purpose	MCU Nominal Science Contents Check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	Unchanged.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified MCU HK parameters show expected increment

Procedure Steps:

Step	Description	Parameter - Unit	Expected Values Before/ During/ After	Actual Values Before/ During/ After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-MCU-03-R.tcl	MCUFRAMECNT	0/-/297		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.33 Procedure SPIRE-IST-COLD-FUNC-SMEC-01-R

Version	2.4
Date	6th December 2007
Purpose	SMEC (REDUNDANT) Encoder/LVDT Sensor Check.
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	HK Parameters SMECENCPWR and SMECLVDTPWR show expected ON values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-01-R.tcl	—	—	—	
2	Check that power to the SMEC LED and LVDT sensor is on	SMECENCPWR SMECLVDTPWR	0/-/1 0/-/1		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.34 Procedure SPIRE-IST-COLD-FUNC-SMEC-03-R

Version	2.4
Date	6th December 2007
Purpose	SMEC (REDUNDANT) Encoder Integrity Check.
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	MCUENGSMECENCSIG1/2 increase as the encoder power is increased

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-03-R.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.35 Procedure SPIRE-IST-COLD-FUNC-SMEC-02A-R

Version	2.5
Date	3rd July 2008
Purpose	Open the SMEC Launch Latch REDUNDANT (Unlatch it)
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and SMEC is latched
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and SMEC is ON and Unlatched
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	20 minutes
Pass/Fail criteria	The SMEC latch is open.

Procedure Steps:

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-02A-R.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test** **The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.36 Procedure SPIRE-IST-COLD-FUNC-SMEC-FFOFFSET-R

Version	1.2
Date	10th July 2008
Purpose	SMEC (REDUNDANT) Open Loop Feed Forward Offset Test
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SMEC PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	60 minutes
Pass/Fail criteria	Optimum SMEC Feed Forward Offset is determined

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-FFOFFSET-R.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
3	Based on the results of this test it may be necessary to set the SMEC FF Offset manually. **SPIRE_SEND_DRCU_COMMAND** • **param 1 = 0x9055xxxx** • **param 2 = 0** **I-EGSE staff will supply the 16-bit parameter value xxxx to this command.**	SMECFFOFFSET	-/ - /xxxx		
4	Based on the results of this test it may be necessary to set the SMEC FF Gain manually. **SPIRE_SEND_DRCU_COMMAND** • **param 1 = 0x9054xxxx** • **param 2 = 0** **I-EGSE staff will supply the 16-bit parameter value xxxx to this command.**	SMECFFGAIN	-/ - /xxxx		

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
5	A manual reset of the encoder signals 1 and 2 offsets may be required. If this is the case Two MANUAL commands will be required to be sent from the CCS: **SPIRE_SEND_DRCU_COMMAND** • **param 1 = 0x9058xxxx** • **param 2 = 0** **SPIRE_SEND_DRCU_COMMAND** • **param 1 = 0x905Axxxx** • **param 2 = 0** **The 16 bit parameters xxxx will be provided by I-EGSE staff**	SMECENCSIG1OFF SMECENCSIG2OFF	-/-/~ Commanded Value -/-/~ Commanded Value		
6	**Note that it may be necessary to repeat this test to fine tune the Feed Forward Offset** **The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Enter Start Date|Time:			

7.2.6.37 Procedure SPIRE-IST-COLD-FUNC-SMEC-04A-R

Version	2.5
Date	3rd July 2008
Purpose	SMEC (REDUNDANT) Open Loop Positioning Test.
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	30 minutes
Pass/Fail criteria	SMEC moves to the commanded positions

Procedure Steps:

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-04A-R.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test** **The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.38 Procedure SPIRE-IST-COLD-FUNC-SMEC-09-R

Version	2.5
Date	3rd July 2008
Purpose	SMEC (REDUNDANT) Open Loop Scan Test.
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • SMEC PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	30 minutes
Pass/Fail criteria	SMEC performs a scan between the commanded positions

Enter Start Date|Time:			

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	A manual reset of the encoder signals 1 and 2 offsets may be required. If this is the case Two MANUAL commands will be required to be sent from the CCS: **SPIRE_SEND_DRCU_COMMAND** • **param 1 = 0x9058xxxx** • **param 2 = 0** **SPIRE_SEND_DRCU_COMMAND** • **param 1 = 0x905Axxxx** • **param 2 = 0** **The 16 bit parameters xxxx will be provided by I-EGSE staff**	SMECENCSIG1OFF SMECENCSIG2OFF	-/-/~ Commanded Value -/-/~ Commanded Value		
2	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-09-R.tcl	—	—	—	
3	**Wait for the I-EGSE staff to confirm the success or failure of this test** **The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.39 Procedure SPIRE-IST-COLD-FUNC-SMEC-07-R

Version	2.5
Date	3rd July 2008
Purpose	SMEC (REDUNDANT) Close Loop Scan Test.
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON.
Final configuration	SMEC is in closed loop
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	60 minutes
Pass/Fail criteria	SMEC performs a scan between the commanded positions and the loop remains closed

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	**Before this test a SMEC calibration table on the I-EGSE may have to be changed. Please confirm with the I-EGSE staff before continuing with the next test.**	—	—	—	
2	Execute TCL script SPIRE-IST-COLD-SMEC-INIT-R.tcl	SMECLOOPMODE	6/-/1		
3	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-07-R.tcl	—	—	—	
4	**Wait for the I-EGSE staff to confirm the success or failure of this test** **The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.40 Procedure SPIRE-IST-COLD-FUNC-SMEC-04B-R

Version	2.5
Date	3rd July 2008
Purpose	SMEC (REDUNDANT) Close Loop Positioning Test.
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON. SMEC is in closed loop.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	20 minutes
Pass/Fail criteria	SMEC moves to the commanded positions and remains in closed loop

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-04B-R.tcl	SMECLOOPMODE	1/1/1		
2	**Wait for the I-EGSE staff to confirm the success or failure of this test** **The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.41 Procedure SPIRE-IST-COLD-FUNC-SMEC-LVDT-R

Version	1.1
Date	10th July 2008
Purpose	SMEC (REDUNDANT) Backup LVDT Close Loop Check
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON. SMEC is in closed loop.
Final configuration	Unchanged
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS • **The Herschel Cryostat should be tilted horizontal**
Duration	90 minutes
Pass/Fail criteria	SMEC remains in closed loop on LVDT

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	**Manual commanding may be necessary during this test. Details to be specified** **Change downlink data rate to 1.5 Mbps** **Send command** **DC27F170**	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.42 Procedure SPIRE-IST-COLD-FUNC-SMEC-02B-R

Version	2.5
Date	3rd July 2008
Purpose	Close the SMEC Launch Latch (Latch it)
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and SMEC is ON and unlatched
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted and SMEC is ON and Latched
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	30 minutes
Pass/Fail criteria	The SMEC latch is closed

Procedure Steps:

Enter Start Date|Time:			

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-FUNC-SMEC-02B-R.tcl	—	—	—	
2	**Wait for the I-EGSE staff to confirm the success or failure of this test** **The I-EGSE staff will need to analyse the test data before continuing the test sequence.**	—	—	—	
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.43 Procedure SPIRE-IST-COLD-SMEC-OFF-R

Version	2.4
Date	6th December 2007
Purpose	SMEC (REDUNDANT) Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are ON.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted. SMEC Encoder and LVDT are OFF.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is booted. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	3 minutes
Pass/Fail criteria	HK Parameters SMECENCPWR and SMECLVDTPWR show expected OFF values.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-SMEC-OFF-R.tcl	—	—	—	
2	Check that the power to the SMEC sensors is switched off	SMECENCPWR SMECLVDTPWR	1/-/0 1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.44 Procedure SPIRE-IST-COLD-MCU-OFF-R

Version	2.4
Date	6th December 2007
Purpose	MCU REDUNDANT Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is booted.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON and MCU REDUNDANT is OFF.
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MCU REDUNDANT is ON. • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified MCU HK Parameter shows expected value.

Procedure Steps:

Step	Description	Parameter – Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute SPIRE-IST-COLD-MCU-OFF-R.tcl	—	—	—	
2	Check that the MCU is switched off	MCUBITSTAT	1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.45 Procedure SPIRE-IST-COLD-SCU-OFF-R

Version	2.4
Date	6th December 2007
Purpose	SCU REDUNDANT Switch OFF
Initial configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is ON.
Final configuration	SPIRE DPU and DRCU REDUNDANT are ON and SPIRE HK is being produced and AC/DC thermometry is OFF
Preconditions	• SPIRE DRCU REDUNDANT is switched ON • SPIRE MIB REDUNDANT is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	5 minutes
Pass/Fail criteria	Specified SCU HK Parameters show expected value.

Procedure Steps:

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Expected Values Before/During/After	Actual Values Before/During/After	Success/ Failure
1	Execute TCL script SPIRE-IST-COLD-SCU-OFF-R.tcl	—	—	—	
2	A few seconds later record the value of parameter SCUTEMPSTAT	SCUTEMPSTAT	0xFFFF/-/0		
3	A few seconds later record the value of parameter SUBKSTAT	SUBKSTAT	1/-/0		
Test Result (Pass/Fail):					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.6.46 Switch OFF After SPIRE REDUNDANT SMEC

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
8.	From the HPCCS test conductor console start the test script to power OFF SPIRE REDUNDANT: **S102999SCVT034_ASDCFTSPIR_PWR_OFF_R**	OK				
9.	On HPCCS when prompted: ~~-~~SPIRE Switch OFF for CFT related tests in Hel/Hell conditions only - Select NO to abort TS if not correct" **Select YES**	YES				
	If **YES** is selected the test script will go on to automatically power off all SPIRE warm units.					

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
	Note: During Switch OFF of SPIRE, the following (5,1) and (5,4) event messages on APID 1281 may be expected and do not indicate a problem: g) EVID 1313 No_MCU_Response_Error h) EVID 21773 ALARM_LSMCU_DEAD **However, be aware that if FDIR is enabled for SPIRE in the CDMU then this may trigger an OBCP**					
10.	On HPCCS when prompted: "Check Telemetry No Longer Updating - OK to continue" Check that parameters: THSK TM2N	 Not refreshing Not incrementing		**AND: SA_1_559**		
11.	Select OK to continue	OK				

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Actual Value	Remarks	P	N
12.	On HPCCS when all autonomous actions have been completed by the power on script **S102999SCVT034_ASDCFTSPIR_PWR_OFF_R** it will prompt: ~~-~~Bus profile left as SPIRE PRIME, change manually after if required - OK to continue"					
13.	Select OK to continue	OK				
14.	On HPCCS stop Packet History displays for the following APIDs:1281,1283	OK				
	SPIRE REDUNDANT OFF					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.7 Satellite & EGSE Switch Off After SMEC Tests

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	Satellite & EGSE Switch Off						
	Initial Conditions: Nominal & Redundant SPIRE warm units OFF						
1	On HPCSS terminate **ALL_SubscribeParams.tcl** test script.	OK					
2	From HPCCS Test Conductor console issue command to disconnect from SPIRE I-EGSE **disconnect HSPIREEGSE**	OK					
3	Confirm from HPCSS and SPIRE I-EGSE that the disconnection was successful	YZS29940= DISCONNECTED			**AND SYS_PARS**		
4	Switch OFF I-EGSE i.a.w. AD 5	OK					
5	Stop monitoring CryoSCOE data on the CCS by selecting Stop Record & Exit from the following script: **K102999ECVT035_ASDGEN_SCOE_CCU_LOG**	OK					
6	From HPCCS disable Monitoring Mode 1 (512sec cycle) for CCU A & B by executing test script: **K102999ECVT001_ASDGENCCU_MnDBOTH1**	OK					
7	From HPCCS power OFF CCU A & CCU B by executing test script: **K102999ECVT001_ASDGENCCU_ABPWROFF**	OK					
8	Switch OFF Satellite/SVM, HPCCS and SCOEs i.a.w. procedure	OK					

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

Step-No.	Test-Step-Description	Nominal Value	Tolerance	Actual Value		P	N
	AD 2 Sections 7.7 to 7.11.						
9	Confirm both Satellite and EGSE powered down	OK					
	End Conditions: Satellite and EGSE OFF						
	END OF SMEC TESTS						

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.8 SPIRE SAFE Switch Off

The following procedure describes the necessary steps to safely switch off SPIRE when directed by RAL personnel if an anomaly should occur.

Version	2.4
Date	6th December 2007
Purpose	To switch OFF the SPIRE instrument if an anomaly should occur
Initial configuration	SPIRE can be in ANY configuration as specified in the test sequence in section 4.1
Final configuration	SPIRE is OFF
Preconditions	• SPIRE FM DPU is electrically integrated with the Herschel Satellite • SPIRE MIB is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	~5-8 minutes
Pass/Fail Criteria	SPIRE is OFF. All instrument subsystems are completely powered OFF.

Notes:

1. **All HK parameters relevant to this procedure can be located on the FUNCTIONAL TEST PARAMETERS CCS display**

2. **The expected values of HK parameters before the execution of a switch-off script are not indicated in the table below because the scripts can be run from any instrument configuration without harming the instrument.**

Enter Start Date|Time:			

Step	Description	Parameter - Unit	Expected value before/after	Actual value before/after
1.	Execute Procedures: ▪ SPIRE-IST-COLD-PDET-OFF-P/R ▪ SPIRE-IST-COLD-BSM-OFF-P/R	PLIABITSAT PSWJFETSTAT PMLWJFETSTAT CHOPSENSPWR JIGGSENSPWR	**- / 0** **- / 0** **- / 0** **- / 0** **- / 0**	
2.	Execute Procedures: ▪ SPIRE-IST-COLD-SDET-OFF-P/R ▪ SPIRE-IST-COLD-SMEC-OFF-P/R	SLIABITSAT SPECJFETSTAT SMECENCPWR SMECLVDTPWR	**- / 0** **- / 0** **- / 0** **- / 0**	
3.	Execute Procedures: ▪ SPIRE-IST-COLD-MCU-OFF-P/R ▪ SPIRE-IST-COLD-SCU-OFF-P/R	MCUBITSTAT SCUTEMPSTAT SUBKSTAT	**- / 0** **- / 0** **- / 0**	
4.	Power off according to procedure 7.2.2.32 for PRIME and 7.2.3.32 for REDUNDANT			

Enter Date/Time:			Sign Off:	

Enter Start Date|Time:			

7.2.9 SPIRE SAFE Switch Off for Standalone SMEC Test Sequence

The following procedure describes the necessary steps to safely switch off SPIRE when directed by RAL personnel if an anomaly should occur.

Version	1.0
Date	6th December 2007
Purpose	To switch OFF the SPIRE instrument if an anomaly should occur
Initial configuration	SPIRE can be in ANY configuration as specified in the test sequence in section 7.2.6
Final configuration	SPIRE is OFF
Preconditions	• SPIRE FM DPU is electrically integrated with the Herschel Satellite • SPIRE MIB is imported in the CCS database. • CCS is up and running • FUNCTIONAL TEST PARAMETERS display is selected on the CCS
Duration	~5-10 minutes
Pass/Fail Criteria	SPIRE is OFF. All instrument subsystems are completely powered OFF.

Notes:

3. **All HK parameters relevant to this procedure can be located on the FUNCTIONAL TEST PARAMETERS CCS display**

4. **The expected values of HK parameters before the execution of a switch-off script are not indicated in the table below because the scripts can be run from any instrument configuration without harming the instrument.**

Enter Start Date|Time:			

	Description	Parameter - Unit	Expected value before/after	Actual value before/after
1.	Execute Procedures: ▪ SPIRE-IST-COLD-SMEC-02B-P/R ▪ SPIRE-IST-COLD-BSM-OFF-P/R	- CHOPSENSPWR JIGGSENSPWR	- **- / 0** **- / 0**	
2.	Execute Procedures: ▪ SPIRE-IST-COLD-SMEC-OFF-P/R	SMECENCPWR SMECLVDTPWR	**- / 0** **- / 0**	
3.	Execute Procedures: ▪ SPIRE-IST-COLD-MCU-OFF-P/R	MCUBITSTAT	**- / 0**	
4	Power off according to procedure 7.2.6.26 for PRIME and 7.2.6.46 for REDUNDANT			

Enter Date/Time:			Sign Off:	

8 Summary Sheets

8.1 Procedure Variation Summary

	Test Change		Curr. No.: Date Page of
Test designation	Test Procedure	Issue	Rev.
Test step changed	Reason for Change		
Prepared by:	Resp. Test Leader	Project Engineer	
PA/QA	Prime	Customer	

Table 8.1-1: Procedure Variation Sheet

8.2 Non Conformance Report (NCR) Summary

NCR - No.	NCR - Title	Date	Open Closed	PA sig.

Table 8.2-1: Non-Conformance Record Sheet

8.3 Sign-off Sheet

	Date	Signature
Test Director		
Operator		
PA Responsible		
ESA Representative		

APPENDIX 1

Actual SCOE cable connection (to be confirmed by AIT)

SCOE CABLES CONNECTION to HERSCHEL S/C					
SKIN-01	PWR Panel (PCDU)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	BS Nom Power	SK01BJ09	PCDU	BS SCOE Cable Plugged	
	BS Red Power	SK01BJ10	PCDU	BS SCOE Cable Plugged	
	BDR1 AIT	SK01BJ11	PCDU	LPS SCOE Cable Plugged	
	BDR2 AIT	SK01BJ12	PCDU	LPS SCOE Cable Plugged	
	SA Nom Power	SK01AJ01	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ02	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ03	PCDU	POWER SCOE Cable Plugged	
	SA Nom Power	SK01AJ04	Battery	EMC Dust Cap	
	SA Red Power	SK01AJ05	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ06	PCDU	POWER SCOE Cable Plugged	
	SA Red Power	SK01AJ07	PCDU	POWER SCOE Cable Plugged	
SKIN-02	PWR Panel (ACC, CDMU, RCS, 1553 & Thruster)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-02	DMS 1553 Bus_A	J01	CDMU	Bus Monitor Cable Plugged	
SKIN-02	DMS 1553 Bus_B	J02	CDMU	Bus Monitor Cable Plugged	
SKIN-02	ACMS 1553 Bus_A	J03	ACC	ACMS SCOE Cable Plugged	
SKIN-02	ACMS 1553 Bus_B	J04	ACC	ACMS SCOE Cable Plugged	
SKIN-02	LV1/FCV 20N CMD S/A M	J05	ACC/RCS	ACMS SCOE Cable Plugged	

SKIN-02	LV2/FCV 20N CMD S/A R	J06	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	RCS Press/Tank Temp/PT Pwr	J07	ACC/PT&TH	ACMS SCOE Cable Plugged	
SKIN-02	Thruster Temp M/LV1 Sts	J08	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	CDMU and ACC EEPROM reprogramming input	J09	ACC/CDMU		Flight Plug SK02P09 Plugged
SKIN-02	CDMU and ACC EEPROM reprogramming input	J10	ACC/CDMU		Flight Plug SK02P10 Plugged
SKIN-02	Thruster Temp R/LV2 Sts	J11	ACC/RCS	ACMS SCOE Cable Plugged	
SKIN-02	Thruster C/B Heaters M	J12	ACC/CBH	ACMS SCOE Cable Plugged	
SKIN-02	Thruster C/B Heaters R	J13	ACC/CBH	ACMS SCOE Cable Plugged	
SKIN-02	Str1/2 On/Off Cmd M/Str1 Sts	J14	ACC/STR-1		ACMS Flight Plug SK02P14 Plugged
SKIN-02	Str1/2 On/Off Cmd R/Str2 Sts	J15	ACC/STR-2		ACMS Flight Plug SK02P15 Plugged
SKIN-02	Gyro A On/Off Cmd	J16	ACC/GYRO-E1		ACMS Flight Plug SK02P16 Plugged
SKIN-02	Gyro B On/Off Cmd	J17	ACC/GYRO-E2		ACMS Flight Plug SK02P17 Plugged
SKIN-03	TTC Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-03	Test point TC + protection jumper EPC1	SK03J01	XPND1/EPC1		Plastic cap
SKIN-03	Test point TC + protection jumper EPC2	SK03J02	XPND2/EPC2		Plastic cap
	RF LINK				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
	RF link for antenna LGA1	N/A	LGA1	RF SCOE LGA1 Plugged	LGA1 Anechoic Cap
	RF link for antenna LGA2	N/A	LGA2	RF SCOE LGA2 Plugged	LGA2 Anechoic Cap
	RF link for antenna MGA	N/A	MGA	RF SCOE MGA Plugged	MGA Anechoic Cap
SKIN-04	ACMS Panel (RWE)				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-04	RWL1 Sgn	J01	ACC/RWL-1		ACMS Flight Plug SK04P01 Plugged
SKIN-04	RWL2 Sgn	J02	ACC/RWL-2		ACMS Flight Plug SK04P02 Plugged

SKIN-04	RWL3 Sgn	J03	ACC/RWL-3		ACMS Flight Plug SK04P03 Plugged
SKIN-04	RWL4 Sgn	J04	ACC/RWL-4		ACMS Flight Plug SK04P04 Plugged
SKIN-05	GYR/QRS Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-05	CRS1 AOCS Sgn	J01	CRS-1/ACC		ACMS Flight Plug
SKIN-05	CRS2 AOCS Sgn	J02	CRS-2/ACC		ACMS Flight Plug
SKIN-05	GYRO RS422 / Test	J03	GYRO	ACMS SCOE Cable Plugged	
SKIN-05	CRS 1/2 Stimuli	J04	CRS-1,2	ACMS SCOE Cable Plugged	
SKIN-05	AAD Sgn M	J05	AAD/ACC	ACMS SCOE Cable Plugged	
SKIN-05	SAS1/2 Sgn M	J06	SAS/ACC	ACMS SCOE Cable Plugged	
SKIN-05	SAS1/2 Sgn R	J07	SAS/ACC	ACMS SCOE Cable Plugged	
SKIN-05	AAD Sgn R	J08	AAD/ACC	ACMS SCOE Cable Plugged	
SKIN-06	STR Panel				
	Connector Function	Skin Connector	S/C unit	SCOE CABLE	Flight Connector
SKIN-06	STR1 Stimuli	J01	STR1	ACMS SCOE Cable Plugged	
SKIN-06	STR2 Stimuli	J02	STR2	ACMS SCOE Cable Plugged	
	UMBILICAL				
	Connector Function	Connector	S/C unit	SCOE CABLE	
	Power/Data	HU1J01	SYSTEM	SCOEs cable Plugged	
	Power/Data	HU2J01	SYSTEM	SCOEs cable Plugged	

APPENDIX 2

Accelerometer Measurement & ACMS Reaction Wheel Profile for Microphonics Test

During reaction wheel activation the accelerometers on OBA and reaction wheel panel according to the Table A4-1 below shall be read. NB: The measurement precision is given by the type of accelerometers used for the test, which is in the order of a few milli-g.

ZONE	CHANNELS ID	DESCRIPTION
OPTICAL BENCH	PACRYO201X	OBA
	PACRYO202Y	OBA
	PACRYO203Z	OBA
	PACRYO204X	OBA
	PACRYO205Z	OBA
	PACRYO206Y	OBA
-Y+Z PANEL	381X	RWL#4 to bracket I/F
	381Y	RWL#4 to bracket I/F
	381Z	RWL#4 to bracket I/F
	382X	RWL#4/RWL#2 to bracket I/F
	382Y	RWL#4/RWL#2 to bracket I/F
	382Z	RWL#4/RWL#2 to bracket I/F
	386X	RWL#3 to bracket I/F
	386Y	RWL#3 to bracket I/F
	386Z	RWL#3 to bracket I/F
	384X	RWL#1 to bracket I/F
	384Y	RWL#1 to bracket I/F
	384Z	RWL#1 to bracket I/F
	383X	RWL#2 to bracket I/F
	383Y	RWL#2 to bracket I/F
	383Z	RWL#2 to bracket I/F

Table A4--1: Measurement Channels for Micro-vibration Test (RD8)

It should be noted that the test configuration, as required in chapter 4.1 of RD8, can not be achieved and the test has to be performed under the conditions of this procedure.

Hmax	25	N.m.s
Tmax	0,05	N.m
Friction	0,005	N.m
DT	10	Min

time (min)	H (N.m.s)
-10	0
0	0
9,25925926	25
10	25
28,5185185	-25
30	-25
39,2592593	0
50	0

Table A4-2: Reaction Wheel Profile

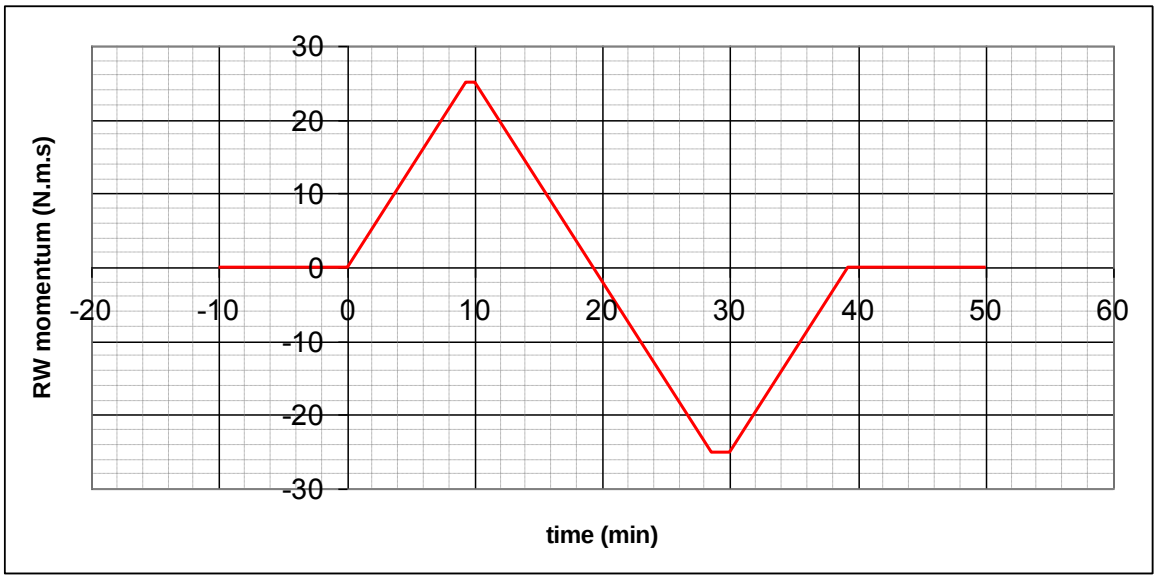

Figure A4-1: Reaction Wheel Profile Graphically

E N D O F D O C U M E N T

	Name	Dep./Comp.		Name	Dep./Comp.
	Alberti von Mathias Dr.	ASG22		Schweickert Gunn	ASG22
	Baldock Richard	FAE12	X	Sonn Nico	ASG51
	Barlage Bernhard	AED13		Steininger Eric	AED32
	Bayer Thomas	ASA42	X	Stritter Rene	AED11
	Brune Holger	ASA45		Suess Rudi	OTN/ASA44
	Edelhoff Dirk	AED2		Wagner Klaus	ASG22
	Fehringer Alexander	ASG13	X	Wietbrock Walter	AET12
X	Fricke Wolfgang Dr.	AED 65		Wöhler Hans	ASG22
	Geiger Hermann	ASA42		Wössner Ulrich	ASE252
	Grasl Andreas	OTN/ASA44	X	Theunissen Martijn/Dutch Space	ASA43
	Grasshoff Brigitte	AET12	X	Martin Olivier	ASA43
X	Hamer Simon	Terma			
X	Hendry David	Terma			
	Hengstler Reinhold	ASA42			
	Hinger Jürgen	ASG22			
X	Hohn Rüdiger	AED65			
	Hölzle Edgar Dr.	AED32			
	Huber Johann	ASA42			
	Hund Walter	ASE252			
	Idler Siegmund	AED312			
	Ivády von András	FAE12			
	Jahn Gerd Dr.	ASG22			
	Kalde Clemens	ASM2			
	Kameter Rudolf	OTN/ASA42			
	Kettner Bernhard	AET42			
	Knoblauch August	AET32	X	Alcatel Alenia Space Cannes	AAS-F
X	Koelle Markus	ASA43		Alcatel Alenia Space Torino	AAS-I
X	Koppe Axel	AED312	X	ESA/ESTEC	ESA
X	Kroeker Jürgen	AED65			
X	La Gioia Valentina	Terma		**Instruments:**	
	Lang Jürgen	ASE252		MPE (PACS)	MPE
	Langenstein Rolf	AED15	X	RAL (SPIRE)	RAL
	Langfermann Michael	ASA41		SRON (HIFI)	SRON
X	Maukisch Jan	ASA43			
X	Much Christoph	ASA43			
	Müller Jörg	ASA42		**Subcontractors:**	
X	Müller Martin	ASA43		Alcatel Alenia Space Antwerp	ABSP
	Peltz Heinz-Willi	ASG13		Austrian Aerospace	AAE
	Pietroboni Karin	AED65		Austrian Aerospace	AAEM
	Platzer Wilhelm	AED2		BOC Edwards	BOCE
	Reichle Konrad	ASA42		Dutch Space Solar Arrays	DSSA
	Runge Axel	OTN/ASA44		EADS Astrium Sub-Subsyst. & Equipment	ASSE
	Schink Dietmar	AED32		EADS CASA Espacio	CASA
	Schlosser Christian	OTN/ASA44		EADS CASA Espacio	ECAS
	Schmidt Rudolf	FAE12		European Test Services	ETS
	Schmidt Thomas	ASA42		Patria New Technologies Oy	PANT
	Schuler Günter	ASA42		SENER Ingenieria SA	SEN