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OPS-OAH

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Herschel SVT-1 Plan

prepared by/*préparé par*	Herschel/Planck FCT
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DISTRIBUTION LIST

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APPROVAL

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CHANGE LOG

reason for change /*raison du changement*	issue	revision	date
Initial draft	draft	1	5 Aug 2007
Updates after MOC internal review	draft	2	16 Oct 2007
Population of list of procedures and daily test schedule	1	0	7th Nov 2007
Updates after external review; detailed changes logged in Change Recored	1	1	12th Jan 2008
Updated after Herschel SVT-1 TRR held on the 13th/14th Feb. 2008	1	2	

CHANGE RECORD

Issue: 1 Revision: 0

reason for change/*raison du changement*	page(s)	paragraph(s)
A detailed change log will be maintained for all issues following issue 1.0 (draft)		

CHANGE RECORD

Issue: 1 Revision: 1

reason for change/*raison du changement*	page(s)	paragraph(s)
Changes as per PROJECT comments (e-mail from M.Krassenburg of 05-DEC-2007; xls file “071205 H-SVT1 Test Plan - ESA Review v1”		
Comments HSVT1_001, HSVT1_002, HSVT1_003: update of distribution list	3	n/a
Comment HSVT1_004: removed duplicate figure.	13	2.3
Comment HSVT1_005: replaced references to “Friedrichshafen” or “ASTRIUM“ with “AIT site”	All	All
Telephone numbers for AIT site/check out areas are to be provided (now since AIT site moved from ASTRIUM to ESTEC)	7	2.8
Added GEN-13 to TBC/TBD list: request telephone numbers for ESTEC AIT check-out area		7.1
“Search and replace” on ASED -> ASTRIUM	All	All
Comment HSVT1_006: deleted sentence "H-SVT1 is conducted under overall supervision of ESOC Test Director who represents etc etc…"	7	2.7
Comment HSVT1_007: removed PROJECT representatives@AIT site	7	Fig 2, 2.8

reason for change/*raison du changement*	page(s)	paragraph(s)
Comment HSVT1_008: made names of key players consistent in Fig 2 and text of chapter 2.7	7	Fig 2, 2.8
Comment HSVT1_009: added section 2.7 “Test Organisation”, demoted existing sectin 2.7 “Test Responsibilities” to subsection 2.7.1 and added and populated subsection 2.7.2 “Conduct Of Reviews”; added Closeout Review to section 6.1 All chapters 2.7.x moved to 2.8.x, since chapter 2.3 was introduced (see below)		2.8.x
Comment HSVT1_011: corrected typo in heading of figure 7: NDIU-TMTCS instead of NDIU-IFMS		Figure 7
Comment HSVT1_013: removed sentence “PROJECT personnel will be present at AIT premises”		3.3
Comments HSVT1_019 and HSVT1_020: corrected typos		
Comments HSVT1_022: revised chapters 7.3 and refer to the procedures as Attachments.		7.3
Changes as per HSC comments (e-mail from L.O’Rourke)		
Updated chapter 2.1 and 2.2 (Figure 1) to include the Near Realtime interface to the ICC@MOC workstations (RTSI)		2.1, 2.2
Added references to ICDs where applicable		2.2
Added “HSC observer in ESOC TBD”		2.7.1
Changes as per ASTRIUM comments (e-mail from M.Koelle of 26-NOV-2007		
Update of distribution list for ASTRIUM (remove Schlosser, add Hamer and Hopfgarten)	3	
AIT Test Site Manager is M.Koelle		2.7.1
Provided more specific S/C configuration for generation of scripts (IST START)		3.3.1
CCU proper is used instead of CCU EQM		3.3.1
Changes as per TAS-I comments (e-mail from F.Rame of 11-NOV-2007		
Updated TAS-I distribution list	3	
Added reference to PRISMA for NCR population		2.4
Replaced AAS by TAS		Various places

reason for change/*raison du changement*	page(s)	paragraph(s)
Provided more detailed expected S/C configuration		3.3.1
Updated references to s/w configuration		3.3.2
Added Appendix 7.4 for Cross Reference Table between Industry Procedure Names and MOC Procedure Names		7.4
Updated distribution list for HIFI according to P.Roelfsema's e-mail of 8-NOV-2007: added Albrecht de Jonge, David Teyssier, and Pat Morris	3	
Updated distribution list: replanced E.Warhurst by E.Doelling, removed F.Di Marco	3	
Updated distribution list for TAS-F following the TBD/TBC telecom TAS-F/ASTRIUM/MOC of 9th January 2008: added B. Gobillot, A.Knight	3	
Revised TAS-I distribution list	3	
Added Dutch Space (M.Oort) to the distribution list	3	
TBC/TBD list updated with ISTR-02: "CDMU OBCPs for Instrument FDIR"		
Chapter about restricted and dangerous commands updated with current MOC knowledge; added TBD/TBC for confirmation needed by TAS		
Added Attachment 7.5 "Units in use for Herschel SVT-1		7.5
Added Attachment 7.6 for Packet Store definition for H SVT-1		
Updated chapter 4.4 "restricted and dangereous commands" according to MOC's understanding		4.4
Inserted chapter 2.3 "H SVT-1 Contribution to Ground Segment Valdiation according to e-mail of F.Keck of 29.11.2007		2.3
Updated OBSM Test Blocks according to e-mail of L.Stefanov of 11.Feb.2008		5.3
Updated AMCS test blocks as per FCT/FD preparation meeting conclusions		5.4

reason for change/*raison du changement*	page(s)	paragraph(s)
Added U.Gageur to the distribution list	3	
Changes according to e-mail of C.Mevi of 8.Feb.2008		
MTL shall be enabled		3.3.1
Replaced P_ (Planck nomenclature) by H_ (Herschel nomenclature) for CDMS procedure names		5.3
Added to CDMS Block 2 procedure H_SVT_DHS_CROM		5.3
Changed procedure names 0001 -> 3081, 0002->1011		5.3
Changes according to e-mail of E.Picallo of 8.Feb.2008		
Also P/L Management functions shall be enabled		3.3.1
All thermal loops shall be enabled for Thermal Testing (Day3 and Day4)		3.3.1
Changes according to e-mail of R.Miniscalco of 11.Feb 2008: on days which have OBCPs loaded, OBCP function needs to be enabled. This is the case for Day 3 and Day 4 (instrument testing)		3.3.1
Populated names for TAS/ASTRIUM key persons following e-mail of F.Niemeijer of 9/01/2008 "H/P OPS: MOM of the telecon 09/01/08 concerning the H-SVT1 plan (ESOC,ASED,TAS-F)"		2.8.1
Updated distribution list for HIFI according to e-mail of P. Roelfsema of 8/11/2008; added Albrecht de Jonge (A.R.W.de.Jonge@sron.nl), David Teyssier (David.Teyssier@sciops.esa.int) and Pat Morris pmorris@ipac.caltech.edu)	3	
Updated instrument test plan		5.8.x

CHANGE RECORD

Issue: 1 Revision: 2

Added B.Gobillot and S.Pezutto to the distribution list	3	
Added G.Apostolo, M.Flentge and J.Huesler to the distribution list	3	
Added M.Cesa to the distribution list	3	
Provided table: test days against calendar days		6.2
Refined TTC tests		5.5
Refined Power Tests		5.6
Refined TCS Tests		5.7
Refined CCU Tests		5.9.3
Descoped OBCP related tests (OBSM-01)		5.3, 6.2.2
Moved SPIRE tests to from DAY3 toDAY4		6.2.3. 6.2.4
Moved HIFI tests from DAY4 to DAY6		6.2.4, 6.2.6
TTC tests on DAY6 confirmed to be via umbilical		6.2.6
Test DAY 10 deferred to later date		6.2.10
TBD/TBC list amended with TRR updates		7.1
DLCM (H_SVT_CCU_DLCM) descoped from H SVT1 (exchange of e-mail M.Koelle/E.Picallo of 29th Feb)		5.9.3
H_SVT_CCU_VLV0 descoped from H SVT1 (exchange of e-mail M.Koelle/E.Picallo of 29th Feb)		5.9.3
H_SVT_TCS_TCTM “Thermal Control Table modification” descoped for H SVT (e-mail E.Picallo of 28/02/2008)		5.7
Refined HIFI test plan		5.8.1
Refined SPIRE test plan		5.8.3

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1 INTRODUCTION

1.1 Purpose and Scope

This document details the planning for the Herschel System Validation Test 1 (SVT-1).

It is not applicable to later SVTs, nor is it applicable directly to the Planck mission SVTs, for which separate dedicated plans are produced.

The purpose of the System Validation Tests is to test and validate the external interfaces from the MOC to the satellite, in closed loop, and to validate the satellite TM and TC database definition. The contents of the SVTs are designed to test these interfaces and the database with an increasing level of realism and complexity from one SVT to the next, making use of the satellite nominal and contingency flight operations procedures in the performance of the tests. Replacement or additional SVT specific procedures may also be required.

This document describes the approach, reporting, configuration, execution and constraints of the Herschel SVT-1, and includes references for all procedures to be executed during the test, accompanied by the planned test schedule.

Herschel SVT-0 was conducted in August 2006. See Herschel SVT-0 Test Plan [RD 1] and Herschel SVT-0 Test Report [RD 2].

1.2 Structure of Document

This test plan or organised into the following sections.

Section	
1	Introduction The section, including purpose and scope, and related documentation lists.
2	System Validation Testing Summary Overview of the test objectives, context, and test management aspects.
3	Overall Test Setup Describes the configuration of the MOC, the spacecraft, the EGSE and communications systems involved in the performance of the SVT.
4	Testing Constraints A collection of the applicable constraints imposed on testing due to spacecraft, software or support equipment functionality.
5	Test Procedures Lists of the test procedures to be executed during the SVT. The actual procedures are included as appendices.
6	Test Schedule The schedule of activities during preparation and execution of the SVT.
7	Appendices Various appendices, including: • TBC/TBD List • Execution log form proforma • Test Procedures

1.3 Applicable Documents

AD	Document Title	Reference
1	Herschel/Planck Mission Implementation Requirements Document	SCI-PT-8818 Issue 1.4, 1 Jul 2004
2	ESOC – QMS Procedure for Ground Segment Integration and Technical Validation	QMS-EIMO-GSEG-PR-1300-OPS Issue 1.6, May. 2006
3	ESOC – QMS Procedure for Performance of GS Operational Validation	QMS-EIMO-GSEG-PR-1600-OPS Issue 1.6, Oct. 2006
4	H/P MOC Ground Segment System Architecture Description	PT-CMOC-SYS-ADD-7101-OPS-ONV Issue 1.0, 1 July 2005
5	H/P Mission Implementation Plan	PT-MGT-MIP-1001-OPS-OA Issue 1.1, Sept. 2004
6	H/P MOC Ground Segment System Test Plan (GSSTP)	PT-CMOC-MGT-PL-1201-OPS-ONV Issue 1.0, 1 Mar 2006
7	Packet Structure Interface Control Document (PSICD)	SCI-PT-ICD-07527 Issue 5.0, 20 July 2004
8	Flight Dynamics Operations Service: Testing Methodology	DTOS-ESOC-TV-ST-0001-TOS-GFS Issue 1.0, June 1999
9	H/P Spacecraft Users Manual	H-P-1-ASP-MA-0693; Issue 3.0, 29th June 2007

1.4 Reference Documents

RD	Document Title	Reference
1	Herschel SVT-0 Test Plan	PT-HMOC-OPS-PL-6202-OPS-OGH; issue 1.2, July 2006
2	Herschel SVT-0 Test Report	PT-HMOC-OPS-RP-6401-OPS-OGH; ssue 1.0, October 2006
3	Herschel/Planck SVM AVM Technical Note	H-P-TN-AI-0052 Issue 02, 28 Jun 2004
4	Herschel/Planck Listen-In Test Plan	PT-CMOC-OPS-PL-6211-OPS-ONV; issue 1.3, may 2007
5	Herschel/Planck NDIU-EGSE Interface Control Document	PT-CMOC-NDI-IC-5702-OPS-ONV; issue 1.0; Sept 2006
6	HERSCHEL Integrated Satellite Test Specification	H-P-2-ASP-SP-0939; issue 4.0; July 2007

1.5 Abbreviations

TAS	Thales Alenia Space
ACMS	Attitude Control and Measurement System
ARTS	Anomaly Reporting and Tracking System
AVM	Avionics Model
CCS	Central Check-out System
CDMU	Command and Data Management Unit
DCR	Dedicated Control Room
DFE	Data Front-End Equipment
EGSE	Electrical Ground Support Equipment
FCP	Flight Control Procedure
FCT	Flight Control Team
FD (S)	Flight Dynamics (System)
FEE	Front End Equipment
GSSTP	Ground Segment System Test Plan
HIFI	(Herschel) Heterodyne Instrument
IST	Integrated System Test
MCS	Mission Control System
MOC	Mission Operations Centre
MTL	Mission Timeline
NCR	Non-Conformance Report
NCTRS	Network Control & Telemetry Receiver System
NDIU	Network Data Interface Unit
OBCP	Onboard Control Procedure
OBSM	Onboard Software Maintenance
OBSW	On-Board Software
PACS	(Herschel) Photo Detector Array Camera and Spectrometer
PSICD	Packet Structure ICD
PSS	Portable Satellite Simulator
PTV	Pre-Transmission Validation
QMS	Quality Management System
SCOE	Special Check-out Equipment
SED	Sun Earth Direction
SODA	SCOS-ORATOS Data Access server (FDS interface)
SOE	Spacecraft Operations Engineer
SOM	Spacecraft Operations Manager
SPACON	SPAcecraft CONtroller
SPIRE	(Herschel) Spectral and Photometric Image Receiver
SPR	Software Problem Report
SREM	Space Radiation Environment Monitor
SSMM	Solid-State Mass Memory
SUM	Spacecraft Users Manual
SVM	Service Module
TPF	Task Parameter File
VC	Virtual Channel
VMC	Visual Monitoring Camera

2 SYSTEM VALIDATION TESTING SUMMARY

2.1 Testing Objectives

- To confirm the ability of the MCS (and ground station back-end equipment) to receive, process and display TM for all the different data rates and data transmission scenarios, within the constraints of the testing context and the communications capabilities.
- To confirm the ability of the ground station equipment (NDIUs) to correctly decode the TM data.
- To verify the data is correctly extracted from TM packets and interpreted correctly.
- To verify the functionality of the MCS telecommanding subsystem, operating in a closed loop with the satellite, in AD and BD modes with either decoder, including directives.
- To verify MCS manual telecommanding functionality.
- To verify the MCS automatic telecommanding functionality.
- Verify the modelling of on-board systems used for telecommanding/display (MTL, SSMM)
- To verify, as far as is possible, the correctness of the operational database (calibration, validity, limits, mode dependency, status consistency, derived parameters, PTV command verification, *etc.*).
- To confirm the ability of the ground station equipment (NDIU) to correctly encode TCs.
- To confirm the ability of the telecommand and telemetry router equipment (NCTRS) to correctly exchange all required data types.
- To confirm the ability of the Flight Dynamics (FDS) systems to retrieve, process and display TM correctly.
- To verify that commands generated by FDS are correctly encoded. This requires modelling of the orbital environment to stimulate the attitude sensors according to the actuator outputs.
- To verify all functionality is in place in the MCS to support nominal and contingency operational flight procedures (*e.g.* redundancy switching, recovery from safe modes).
- To confirm that the spacecraft response to commands is as expected by the procedures as defined in the Spacecraft Users Manual.
- To verify that the products of the OBSM function can be correctly loaded on-board the satellites.
- To verify that the contents of the on-board memories can be correctly dumped, stored, interpreted and displayed by the OBSM function.
- To verify that OBCPs can be generated, loaded, executed and controlled from the ground (TBC).
- To provide reference data useful for the verification of the spacecraft simulator.
- To train the Flight Control Team
- To validate Interfaces and Interface Control Documents
- To validate (to the maximum extent possible) the Spacecraft Simulator
- To identify Spacecraft and Ground Segment anomalies and incompatibilities
- To verify that the Near Realtime TM is correctly routed from the NCTRS to the ICC@MOC workstations

2.2 Interfaces under Test

The following interfaces are those identified in the H/P ground segment that will be exercised during SVT-1. They comprise the TM and TC links between the spacecraft and the mission control system, and also applicable interfaces between the Flight Dynamics systems and the control system. The overall system is illustrated in Figure 1: Ground interfaces

Interface	Reference	ICDs
Incoming TM	G01.A.STA.NCT	IG-TMTC-ICD-1000-TOS-GIB
Forward TCs	G01.B.NCT.STA	IG-TMTC-ICD-1000-TOS-GIB
HK TM from MCS via SODA	M02.A.MCS.FDS	FDOS-FDIS-ICD-1422-TOS-GFS
Propagation delay data to MCS	M02.D.FDS.MCS	PT-CMOC-FD-ICD-2102-OPS-GFI[1]
FD-TPFs from FDS to MCS	M02.E.FDS.MCS	S2K-MCS-ICD-0003-TOS-GCI PT-CMOC-FD-ICD-2105-OPS-GFT
FD Orbit Events File delivery to MCS	M02.J.FDS.MCS	PT-CMOC-FD-ICD-2103-OPS-GFI
Forward Telecommands, MCS to NCTRS	M10.A.MCS.NCT	N2K-MCS-ICD-0002-TOS-GCI
Simulator Forward TCs	M10.B.MCS.NCT	N2K-MCS-ICD-0002-TOS-GCI
Incoming TM	M11.A.NCT.MCS	N2K-MCS-ICD-0002-TOS-GCI
Simulator TM	M11.C.NCT.MCS	N2K-MCS-ICD-0002-TOS-GCI
TM spacecraft link	SO1.A.SC.STA	SCI-PT-ICD-07418
TC spacecraft link	SO1.B.STA.SC	SCI-PT-ICD-07418
Instrument Manuals and Configuration [Herschel]	H01.C.HSC.SDS	
Task Parameter Files [Herschel]	H01.D.HSC.SDS	PT-HMOC-OPS-ICD-6111-OPS-OAH PT-HMOC-OPS-ICD-6112-OPS-OAH
Instrument OBSW files [Herschel]	H01.G.HSC.SDS	S2K-MCS-ICD-0014-TOSGCI
Instrument Flight Operations Procedures	H01.P.SDS.HSC	
OBSW Images (TM)	H01.Q.SDS.HSC	S2K-MCS-ICD-0014-TOSGCI
NRT TM from NCTRS	M14.A.SDS.SGS	PT-CMOC-MDS-ICD-3101-OPS-GDS

[1] During H-SVT-0 the version ICD PT-CMOC-FD-ICD-2102-OPS-GFI, issue 1.0 described the valid interface from HPFDS to MCS on Solaris, but not for MCS on Linux. The ICD needed to be enhanced for Linux after successful compilation of s/w and test on Linux. The status needs to be TBC for H-SVT1.

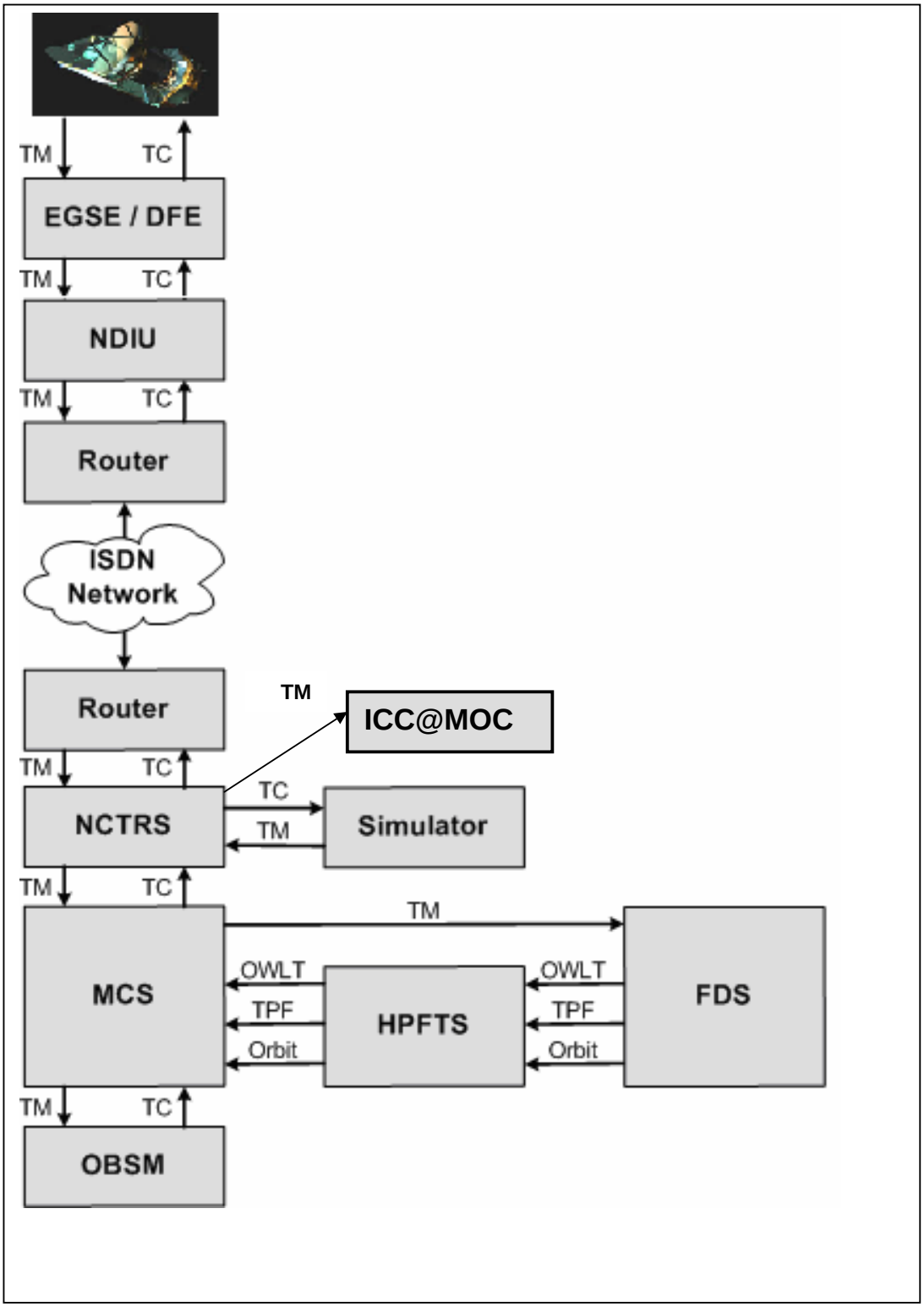


Figure 1: Ground interfaces

2.3 H-SVT-1 Contribution to Ground Segment Validation

The SVT-1 contributes to following ground segment system level validation tests:

Herschel SVT-1:

HGS-VT-OBS-1 Herschel OBSM Chain Validation Test
-> Contribution by uploading instrument OBSW images delivered by HSGS

HGS-VT-TC-1.0 Herschel Command Chain Validation Test
-> Contribution by uploading instrument TPFs delivered by HSGS

HGS-VT-TM-1.0 Herschel End-to-End TM Delivery Validation Test
-> Contribution to RTSI validation by instrument teams using ICC@MOC

2.4 Test Reporting

During the execution of SVT -1, Event Logs shall be maintained for the positions SOE (Spacecraft Operations Engineer) and SPACON (Spacecraft Controller – this position shall be manned by a Herschel /Planck Analyst during the execution of SVT-1), using the Form Sheets attached in Appendix 7.2.

In the event that an anomaly is detected during the course of an SVT -1 test, the relevant observation shall be logged in the Form Sheets. After a closer assessment, all observations recognised as anomalies are raised as Anomaly Report in the Anomaly Reporting and Tracking System (ARTS).
For those Anomaly Reports affecting the Space Segment, ESOC is responsible to feed the Non Conformance Report Tracking System (NCTS on PRISMA) with the relevant records.

After the execution of SVT -1, a test report will be prepared, providing a summary of the tests undertaken, the results of the tests, the actual execution time against the estimated execution time, a list of the anomalies detected during the execution of the tests and a detailed description of the anomalies

2.5 Testing Duration

SVT-1 will be performed over a period of 10 working days.

2.6 Test Context

The spacecraft model under test at SVT-1 is the Herschel Flight Model (FM). It will be connected to the MOC via ISDN lines. The interface between the spacecraft and the communications systems is via an ESOC-provided NDIU (Network Data Interface Unit) that interfaces to the NCTRS (Network Control & Telemetry Receiver System) at ESOC. For the Herschel SVT-1 two NDIU systems are available at the AIT site: main unit shall be the NDIU-IFMS, providing a high level of representation of the real ground station equipment; the NDIU-TMTCS is available as back-up to the NDIU-IFMS. All SVTs shall be conducted from the Herschel/Planck Dedicated Control Area.

2.7 Test Approach

The following notes describe how the SVT will be conducted.

- Each test will be conducted in accordance to the agreed SVT procedures.
- A short **briefing** (expected duration: 30 minutes) will be held daily (via the voice loop) before start of the test between the Test Site Manager and the ESOC Test Manager supported by their teams as required. This will confirm that:
    - The S/C configuration is in accordance to the configuration as specified in the SVT Plan
    - The SVT procedures and CCS procedures to be executed during the day are complete/agreed/etc.
    - All safety precautions are taken
    - No open work (from the day before) remains
    - Both sites are ready to support the test
- Following the (successful) briefing the operations are handed over from the Test Site to ESOC (nominally at 09:00)
- The daily test is carried out according to the agreed procedures.
- Any changes to or deviation from the pre-agreed SVT-1 Test procedures is only possible after agreement between the AIV Test manager and the ESOC Test Manager. For simple changes verbal agreement via VOICE INTERCOM will be sufficient. In the event of major changes the executed test will be abandoned and the test will be rescheduled for the next possible opportunity.
- A log of all major steps in the test procedures is maintained.
- Anomalies are recorded as outlined in paragraph 2.3 above. (whenever possible the test will proceed as planned)
- The SVT-1 will be sequenced in such a way that (to the maximum extent possible) failure of one procedure will not: (i) prevent subsequent procedures to run; (ii) require re-running the test from the beginning once the failure has been corrected.
- In case of major anomalies handover from ESOC to the Test Site is performed immediately in order to allow the AIV Team to safeguard the spacecraft.
- Nominally handover of operations from ESOC to the Test Site will take place upon termination of the daily test activities according to the SVT Plan (normally at 17:00)
- A **de-briefing** (expected duration: one hour) will be held (via the voice loop) between the Test Site and ESOC upon termination of the daily activities. The aim is:
    - To review the daily test activities and in particular the problems and anomalies encountered
    - To review the test data (if relevant)
    - To make recommendations for improvement as required
    - To review and update if necessary the planning for next day
    - To confirm the start configuration of the spacecraft for the next day.

At the end of the SVT-1 a Test Report will be written in order to fully document the experience gained during the conduct of the test. Full details of incidents and anomalies raised shall be included, including any NCRs raised on the spacecraft side by the Industrial test team. The Test Report shall be issued not later than four week after the end of SVT-1.

2.8 Test Organisation

2.8.1 Test Responsibilities

Figure 2 shows the interrelation between the various players during SVT-1 preparation and execution with respect to the responsibilities shared.

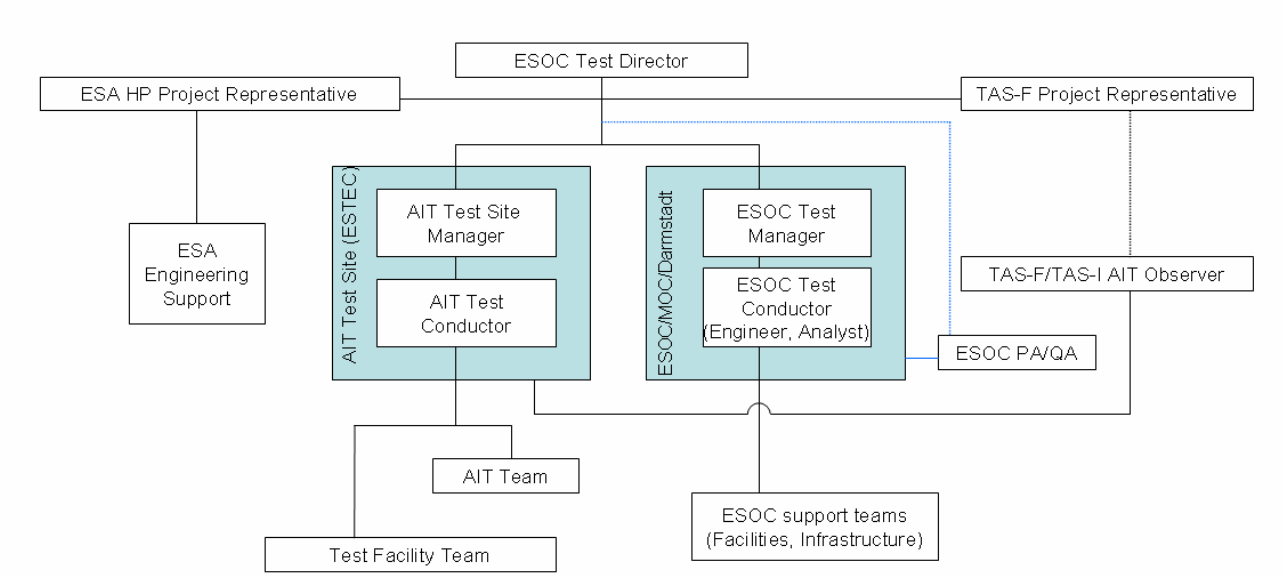


Figure 2 SVT Responsibilities Organisation

ESA HP Project Representative:	M. Krassenburg
ESOC Test Director:	J.Dodsworth
ESOC Test Manager:	M.Schmidt
ESOC Test Conductor	HP Flight Control Team/ Flight Dynamics Team
ESOC PA/QA:	S.Scaglioni
HIPT Project Representative:	B.Gobillot
AIT Test Site Manager and Test Conductor:	M.Koelle
HIFI Representative at AIT site:	TBD
HIFI responsible in ESOC:	D.Teyssier
PACS Representative at AIT site:	TBD
PACS responsible in ESOC:	H.Feuchtgruber
SPIRE Representative at AIT site:	TBD
SPIRE responsible in ESOC:	S.Sidher
HSC observer in ESOC	L.O'Rourke

Other key posistions are:

HIPT PA:	A. Knight in ESTEC

A HIPT engineering team will be located in ESOC for support.
An engineering team (outside the HIPT) will support the preparation and conduct of the H-SVT-1 as well.

2.8.1.1 ESOC Test Team

The ESOC Test Team headed by the ESOC Test Manager will be responsible for the overall conduct of the SVT-1 tests, i.e. for the management of the test activities at ESOC site and the configuration and control of the

Herschel/Planck MCS, the NCTRS and NDIUs. The ESOC Test Manager will also coordinate activities with MOC Flight Dynamics.

The ESOC Test Manager will coordinate ESOC activities and will report to the Test Director.

In case problems arise during the execution of an SVT-1 test, resulting in the loss of test time, the ESOC Test Manager will decide how to reschedule outstanding tests to make optimum use of the remaining test time.

At the end of each SVT-1 test period ('end of the day') control of the spacecraft will be returned to the AIV Team. This will allow the AIV Team to de-power the spacecraft.

2.8.1.2 Industry Test Team

Responsibility for spacecraft health and safety rests with the AIV Team under the leadership of the AIV Test Site Manager. The AIV Team will ensure that the satellite hardware and software configuration is such that during the execution of the agreed SVT-1 test procedures no dangerous spacecraft situation may arise.

Responsibility for instrument health and safety lies with the instrument representatives located at the AIT site.

For the execution of the SVT-1 tests TAS-F/I and ASTRIUM shall make available sufficient manpower for the required periods (plus additional time for the pre-test set-up and post-test shut-down).

The AIV Team will be responsible for the operation of all equipment associated with the spacecraft and EGSE, the preparation for each test of SVT-1 and set-up of the required starting conditions. When the EGSE and spacecraft configuration set-up is completed, the AIV Test Site Manager advises the ESOC Test Manager that control of the spacecraft is passed to ESOC.

2.8.1.3 PIs' Test Team

The PI's or designated representatives (at AIT premises) will ensure that the instruments configuration during the execution of the agreed SVT-1 procedures is such that the instruments health and safety is guaranteed.
Observers from the instrument teams may be present in ESOC during the conduct of the instrument tests (TBC).

2.8.2 Conduct Of Reviews

The following reviews related to the Herschel SVT-1 will be called for by MOC and shall be conducted and supported by all contributing parties:

T-2 weeks	H-SVT-1 Test Readiness Review
Latest T+4weeks	H-SVT Closeout Review

During the H-SVT-1 Test Readiness Review all parties involved in the H-SVT-1 conduct shall present their readiness to support the H-SVT-1. The review shall conclude on the clearance for going ahead with the H-SVT-1 conduct or shall identify and propose a resolution for all open issues. The H-SVT-1 Test Readiness Review shall be supported by

- MOC
  - H-SVT-1 Test Conductor (chair)
  - Herschel/Planck Technical Officers
  - Herschel/Planck Flight Control Team
- PROJECT
- TAS-F
- TAS-I
- ASTRIUM
- Instrument Teams

The H-SVT-1 Closeout Review shall ensure that resolution of problems found during the H-SVT-1 conduct are harmonised between ESA, Industry and the Instrument Teams, i.e. the H-SVT-1 Closeout Review shall address the

duplication of Anomaly Reports raised during the SVT conduct with already existing NCRs and shall clarify resolution of newly raised NCRs. The H-SVT-1 Closeout Review shall be supported by

MOC
H-SVT-1 Test Conductor with the support of the FCT
PROJECT
TAS-F
TAS-I
ASTRIUM
Instrument Teams (if needed)

2.9 Voice Procedures

For the purpose of the communication between the ESOC Test Team and the AIV Test Conductor, standard ESA Voice Procedures shall be used.

The VOICE INTERCOM loop from ESOC/Darmstadt to the AIT site will be referred to as
"HP IFMS" if NDIU-IFMS is connected (prime NDIU for H-SVT-1)
"HP NDIU A" if NDIU-TMTCS is connected (back-up NDIU for H-SVT-1)

The ESOC test conductor will answer to the call sign "MOC".
The ESOC Flight Dynamics team will answer to the call sign "HP Flight Dynamics"
The AIV Test Director will answer to the call sign "AIV".

The following public telephone lines will be available as back-up:

Herschel/Planck Dedicated Control Area :	+(49) 6151 902706 (Stack 1) +(49) 6151 903229 (Stack 2) +(49) 6151 903230 (Offline discussion / Debrief)
FAX in HP Dedicated Control Area:	+(49) 6151 903439
ESOC/Flight Dynamics room:	+(49) 6151 90 3201
ESOC/Flight Dynamics Fax:	+(49) 6151 90 3199
ESOC/SHIFTCOOR:	+(49) 6151 90 2496
ESOC/Computer Support	+(49) 6151 90 2249
Check-out operator	+31-71565-4695 (54695 direct call from ESOC)
Clean Room	+ - 5875 (55975)
FAX:	+ - 3289 (53289)

3 OVERALL TEST SETUP

3.1 System Test Communications Setup

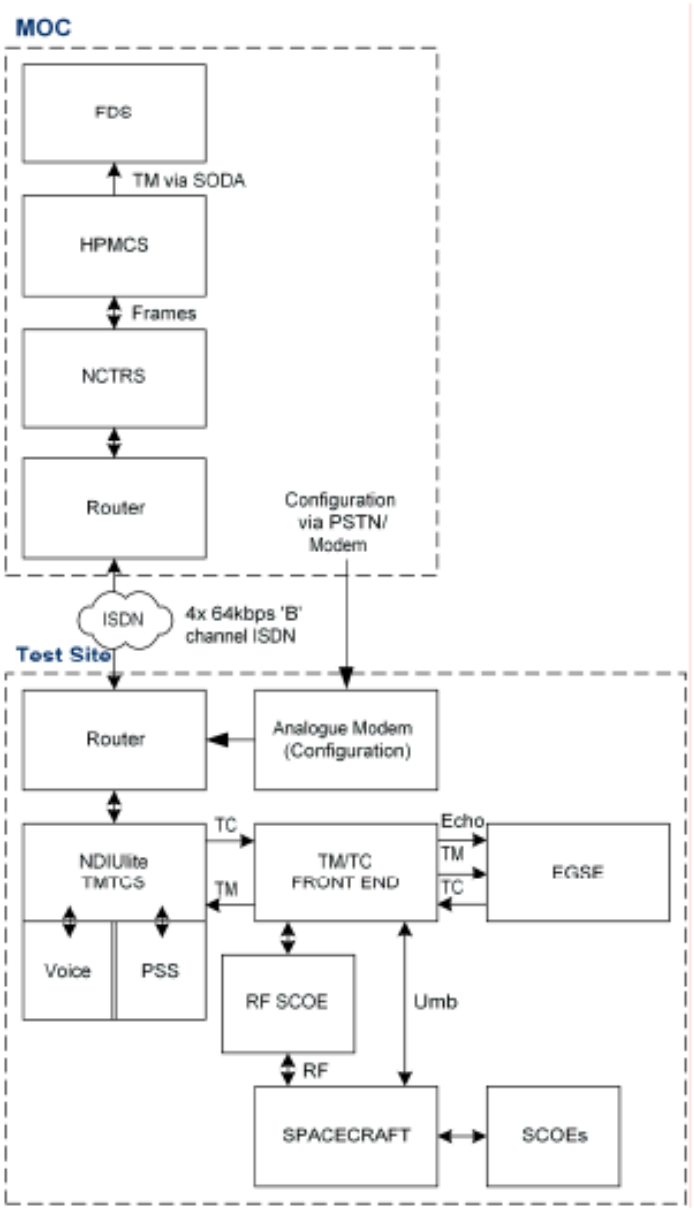


Figure 3: Test Configuration with NDIUTMTCS and NDIUIFMS at Test Site [RD 4]

3.2 MOC Configuration

3.2.1 Software Configuration

Subsystem	*Configuration for H-SVT-1*
HPMCS	D4-P02 for HMCA, HLTA, sun 41, sun 42, sun 43, sun 44, sun 45, sun 46
OBSM	Integrated in HPMCS as of version D4-P02
Spacecraft Database	Provided by TAS-F
Database Editor	2.4
HPSDB mirror site	3.3.1.15
Spacecraft Simulator	D3P0x (TBD)
NCTRS	V10.1.0 (TBC)
NDIU	NDIU-IFMS; NDIU-TMTCS (NDIU A) as back-up
Flight Dynamics	D2 *(configuration recorded by OCMS)*

3.2.2 Hardware Configuration

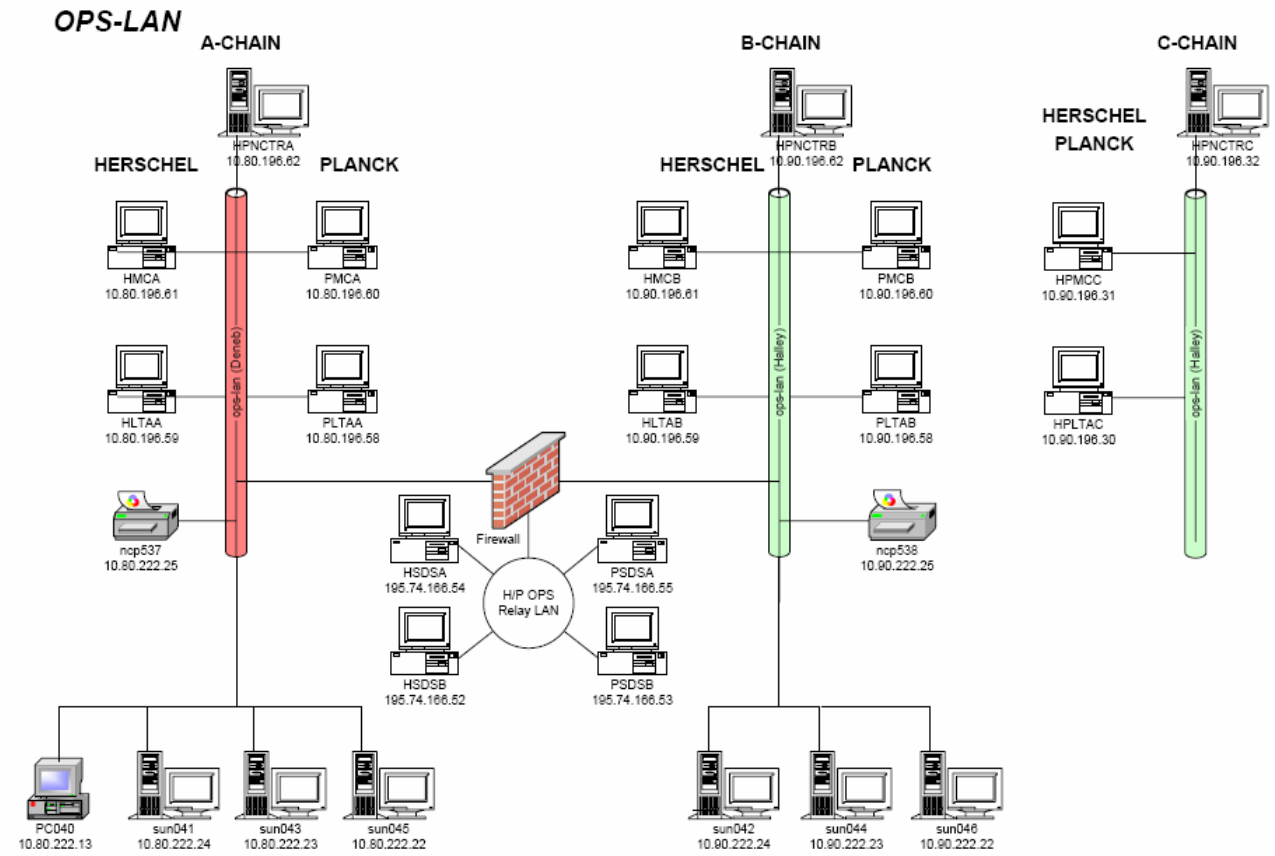
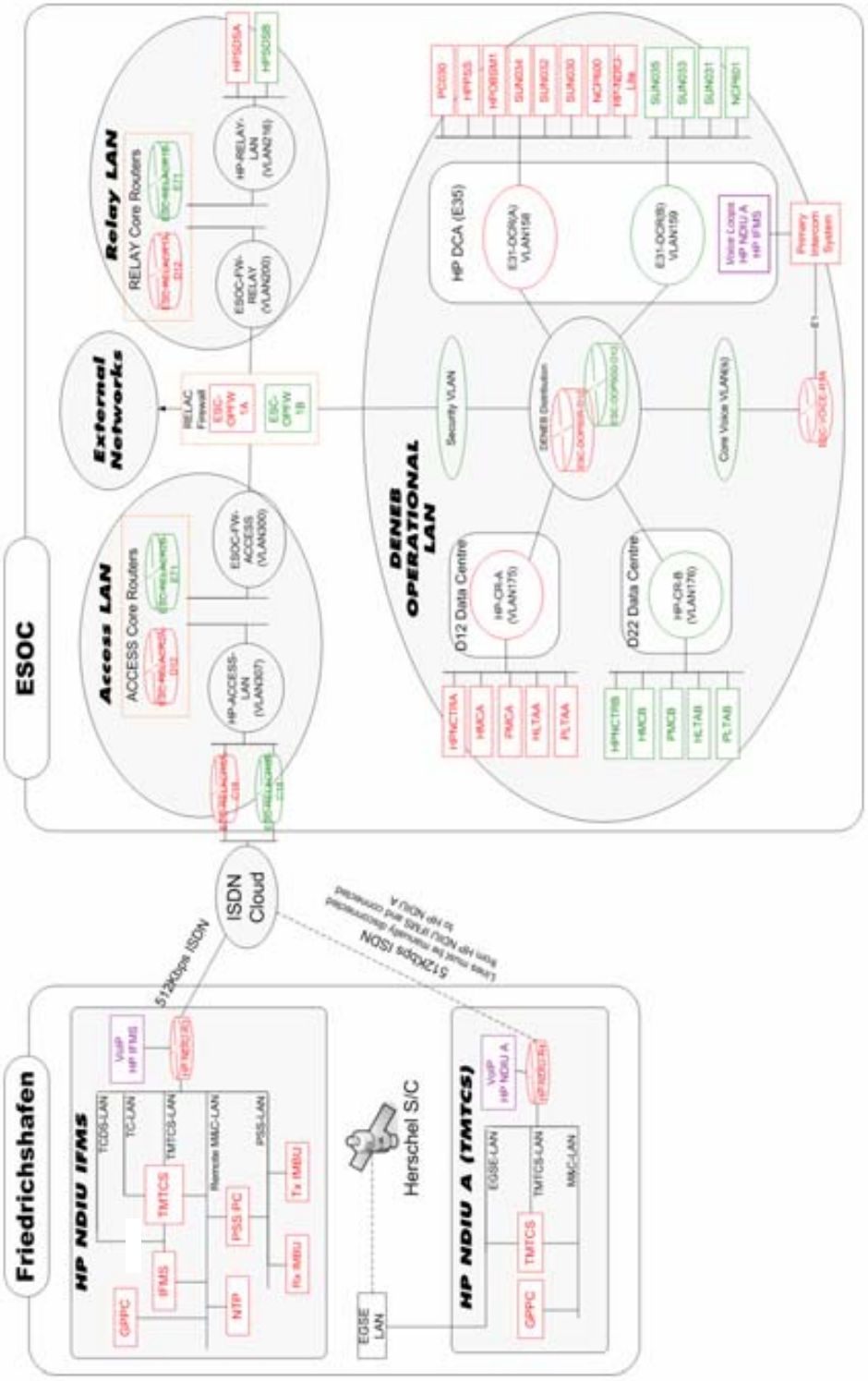


Figure 4: Hardware Configuration

3.2.3 Communications and LAN Configuration



[Provided by E. Warhurst, 24 July 2006]

Figure 5 Communications and LAN Configuration

3.2.4 NDIU Configuration

For the conduct of the Herschel SVT-1 the NDIU-IFMS will be used as a baseline. The NDIU-TMTCS (NDIU A) is available as back-up.

The configuration for the NDIU-IFMS is as outlined in Figure 6 NDIU-IFMS Configuration below.

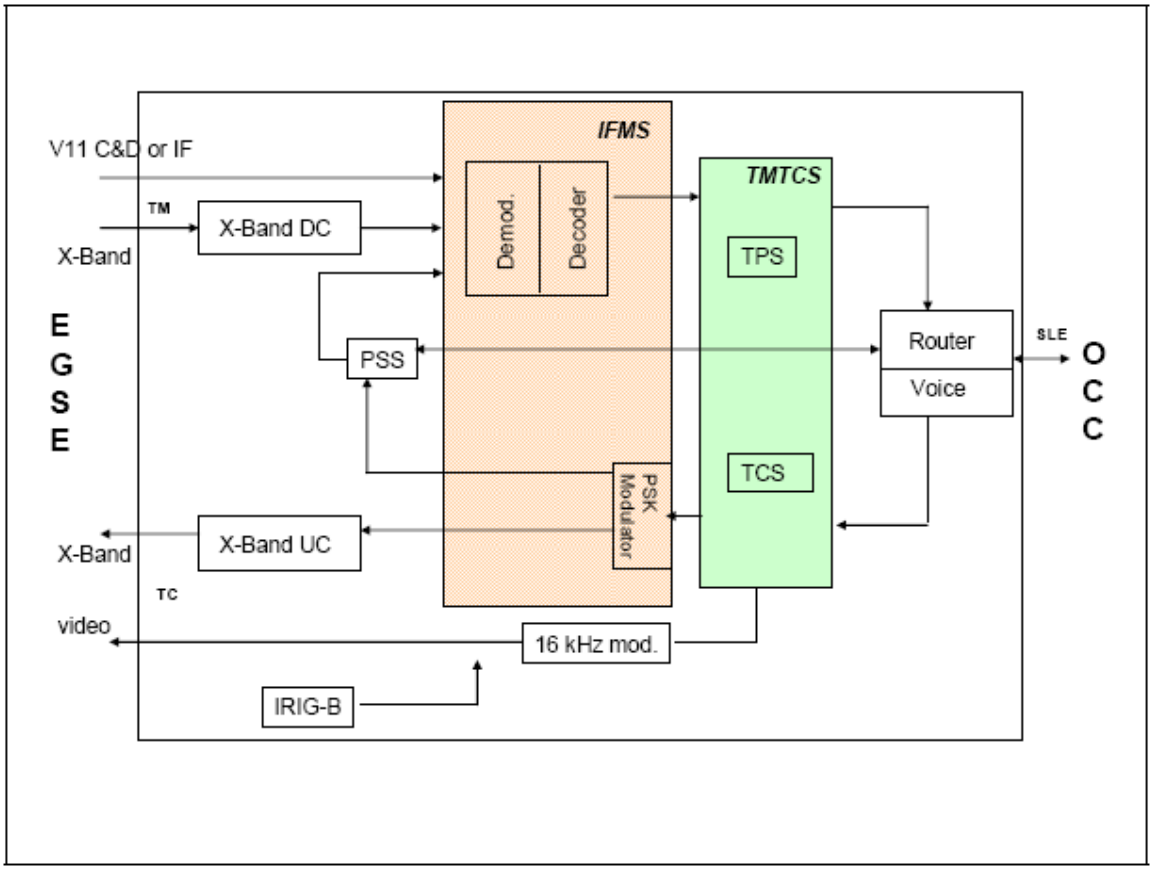


Figure 6 NDIU-IFMS Configuration [RD 5]

The configuration for the NDIU-TMTCS is as outlined in Figure 7 NDIU-TMTCS Configuration below.

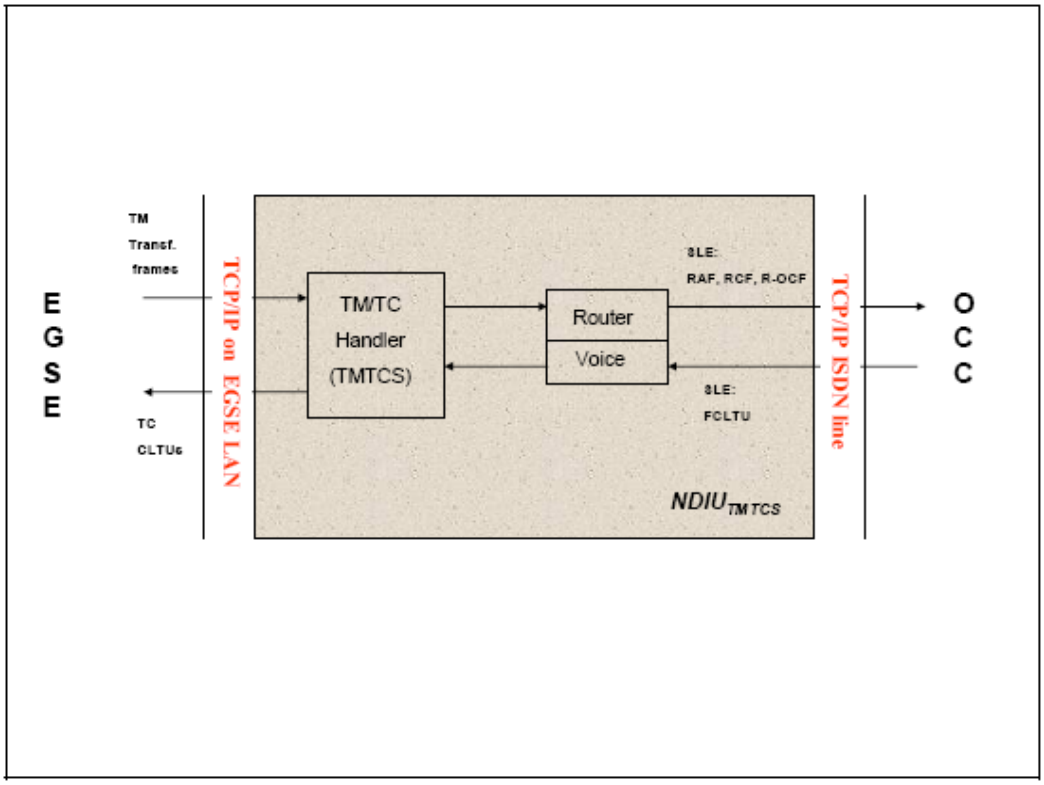


Figure 7 NDIU-TMTCS Configuration [RD 5]

3.3 Test Site Configuration

- RF subsystem SCOE: bypass umbilical will be used mainly; dedicated test scenarios will be run on RF (TBC)
- ACMS/Environment SCOE
- Power SCOEs (umbilical power source, battery model, solar panel simulator, main bus power as required)
- HPSDB snapshot for the Herschel FM, to produce representative bridge files for this test (provided as per “consistent data-set”).
- HPSDB central site, version V.3.3.1.27
- EGSE
    - EGSE set up. This includes the necessary simulation equipment, e.g. provision of stimuli for S/C sensors, as well as any special measures necessary to ensure handling of “dangerous” commands e.g. installation of break-out boxes, programming the “inhibit” command list in the CCS, etc. At any time the CCS provides Industry/Project the means to monitor SVT-1 and to ensure spacecraft safety in case of spacecraft and/or infrastructure malfunctions.
- $NDIU_{IFMS}$
    - An NDIUl-IFMS and an NDIU-TMCS will be located at the AIT site (ESTEC).
- ISDN connection supporting TM/TC flows and voice channel
- Test personnel

- o It is not expected that ESOC personnel are required at the test site; Industry staff will be at ESOC.
- o A PROJECT representative will be present in MOC, witnessing the H-SVT-1 conduct.

3.3.1 Spacecraft Configuration

The Herschel SVT-1 will be executed against the Flight Model (FM) of the Herschel Spacecraft SVM and the Flight Models of the Herschel Instruments. The payload module will be configured under He I conditions (temperature level of 4 k).

For the set-up of the S/C for each SVT-1 test day, the default power-up sequences and AIT procedures may be used; if need is identified during the SVT-1 Test Plan and Test Procedures review cycle, special dedicated AIT configuration procedures may be required.

. The expected default S/C configuration, when operations are handed over to MOC is:

- S/C in Sun Acquisition Mode (SAM);
- Open CDMU Separation Straps
- CDMS FDIR Mode set to AFS;
- All default tables as per EEPROM content (as per Consistent data set relevant to CDMS OBSW 3.1.3) except for TCT (TBC);

Note
In Herschel TCT the following loops will be likely ON:

TCT Loop	*Unit*	*ON OFF Thresholds*
5,16, 21, 29, 45, 47	*RCS Pipes*	*(23,24)degC*
14, 25	*CRS 1, 2*	*(49, 49.5)degC*
18	*GYRO*	*(62.5, 63)degC*
30	*PT-LF-LV1-LV2*	*(23,24)degC*

Herschel IST Test Spec seems to ask for "an ambient temperature TCT" to be loaded before starting the tests but no further input is provided. TAS-F to confirm.

- Default 1553 SDB FDIR enabled;
- Default Survival Register set up;
- CDMU RMs enabled;
- All CDMU ASW functions enabled apart from Decontamination.;
- SSMM bank 0,1,2+0,1,2 ON and Initialised, recording enabled;
  Note
  This is the expected default configuration in flight and allows more flexibility in allocating CDMU tests during the SVT-1.

- Packet Stores definition as per Appendix 7.6;
- TM bit rate set to 150 Kbps;
- TC bit rate set to 4Kbps;
- RFDN SWs all in position BBBB;
- HPS 1 to 9 ON; HPS 10 to 18 OFF
- LCLs ON as per Nominal Separation sequence to SAM, i.e. :
  - LCL 33 & 34 ON (ACC Cold A & B),
  - LCL 31 & 32 ON (CDM Cold A & B)
  - LCL 23 ON (XPND1 TX),
  - LCL 49 ON (TWTA1),

- LCL 13 & 14 ON (GYRO A & GYRO B),
- LCL 15 & 24 ON (CRS 1 & CRS 2),
- LCL 17 ON (Cat Bed Heaters Nom),
- LCL21 & 22 ON (STR1 & STR 2),
- LCL 47& 48 ON (RCS LV A & LV B),
- LCL 29 ON (VMC);
- LCL 45 & 46 ON (ACC RCS Thrusters A & B),
  Note
  Relevant 1553 commands to re-enforce LCL 45 & 46 *ON status shall be executed as a first operation after the transition to SAM to align the actual LCLs status and the current ASW internal configuration.*

- LCL 37 & 38 ON (CCU A & B);
- LCL 25 & 26 ON (SPIRE Launch Lock)

Note
All the remaining LCLs are considered OFF while all FCLs are considered ON.

- BDR-1 and BDR-2 ON
- BCR-1, BCR-2, BCR-3 ON
- Battery Simulator supplying 24V (70% SOC)
- Solar Arrays Simulator supplying 1700 W (TBC by TAS whether this is appropriate for instrument operations on day 3 an day 4 as well), configuring ISA to 1,88A per section (assuming all sections available);
- Open ACC Separation Straps
- ACC ON, synchronised and correctly configured on the 1553 SDB;
- ACMS FDIR Mode set to AFS;
- ACMS RMs enabled;
- ACMS in SAM after separation with the following configuration:

  - STR-1 and STR-2 OFF
  - GYRO-PPSMA ON
  - GYRO-PPSMB OFF
  - RWs 1 to 4 OFF
  - LV-A OPEN
  - LV-B CLOSED
  - RCS Branch A Thruster FCVs CLOSED
  - RCS Branch B Thruster FCVs OPEN
  - Arm Switch LV-A ARMED
  - Arm Switch LV-B DISARMED
  - ACB (ACMS Control Bus) 1553 I/F having the GYR unit active.

- TTC-1 chain ON (TX-1, TWTA-1 + EPC-1+ TWT Amp-1)
- Instruments all OFF
- CCUs ON and correctly configured on the 1553 SDB

Note
CCUs need to be ON to correctly monitor the He conditions.

Note:
Dump of the SSMM packet stores at the end of each test day is mentioned in the daily schedule. Actually this activity is not mandatory; aim should be that it shall be done at least once successfully and shall be optional for all other H-SVT-1 test days.
Special configuration items for the specific test days are outlined below.

DAY1:

CDMU Testing
No special set-up

CCU Testing
No special set-up

SREM testing:
No special set-up

DAY2:

CDMU Testing
No special set-up

OBSM Testing
No special set-up

DAY3:

CDMU OBCPs related to instrument FDIR (for all three instruments) loaded and OBCP function enabled.

SPIRE Testing
Instrument off (will be switched on via MOC SVT procedures).

PACS Testing
Instrument off (will be switched on via MOC SVT procedures).

Thermal Testing
- Default Thermal Control Table (TCT) having all thermal Loops enabled.

Mirrors Decontamination Testing
No special set up

LOU Baffle Decontamination Testing
No special set-up

Note
LOU Baffle Management function status is enabled by default, but the Lou Baffle controlling is disabled).

DAY4:

CDMU OBCPs related to instrument FDIR (for all three instruments) loaded and OBCP function enabled.

HIFI Testing
Instrument off (will be switched on via MOC SVT procedures).

Clarification: is the 1700 W power required in S/C default configuration sufficient to supply HIFI as well?

PCS Testing
No special set-up

Thermal Testing
- Default Thermal Control Table (TCT) having all thermal Loops enabled.

DAY5:
TTC Testing

- Connection via RF SCOE
- Spacecraft in Nominal Mode leading to the following change in the TTC configuration:
  - RFDN SWs configured in "ABAB" position (MGA on RX1/TX1, LGA1 on RX2/TX2);
  - All essential and periodic HK packets available in real time TM;
  - FDIR Mode set to Autonomous Fail Operational (AFO).

DAY6:
TTC Testing
As per Day 5 with Umbilical connection

DAY7:
ACMS Testing (Block 1)
No special set up

Initial conditions for day 1, OD 136:
Epoch (UTC): 2008-12-13T07:00:00Z
Epoch(MJD2000): 3269.29
Spacecraft position (mean equatorial geocentric system of epoch J2000.0):
[-373267.375190, 1248127.240400, 380131.965040] km
Spacecraft velocity (mean equatorial geocentric system of epoch J2000.0):
[-0.457511, -0.057996, 0.150396] km/s
Spacecraft attitude quaternion at Epoch:
[0.8164311268819,-0.056082567294275,0.11733350371002,0.56260804261152]
Spacecraft attitude Euler angles [3,1,3] at Epoch:
[7.8507335949422,109.84093695484,15.709950230063] degrees

CDMU Testing
No special set-up

DAY8:
ACMS Testing (Block 2)
ACMS in SAM after separation with STR-1 ON and correctly configured on the ACB

Initial conditions for day 2, OD 137:
Epoch (UTC): 2008-12-14T07:00:00Z
Epoch(MJD2000): 3270.29
Spacecraft position (mean equatorial geocentric system of epoch J2000.0):
[-412410.821256, 1242558.916963, 392995.256013] km
Spacecraft velocity (mean equatorial geocentric system of epoch J2000.0):
[-0.448390, -0.070795, 0.147371] km/s
Spacecraft attitude quaternion at Epoch:
[0.80233458473516,-0.0045587133385773,0.19127506416775,0.56537799930505]
Spacecraft attitude Euler angles [3,1,3] at Epoch:
[18.365836945901,106.70972771623,19.016917501611] degrees
External torques: deactivated

CDMU Testing

No special set-up

DAY9:
ACMS Testing (Block 3)

- ACMS in SCM with RWs and both STRs ON and correctly configured on the ACB; diagnostic packets (as per AOC_SPRO) enabled.

Initial conditions for day 3, OD 138:
Epoch (UTC): 2008-12-15T07:00:00Z
Epoch(MJD2000): 3271.29
Spacecraft position (mean equatorial geocentric system of epoch J2000.0):
[-450717.092267, 1235915.655036, 405600.379120] km
Spacecraft velocity (mean equatorial geocentric system of epoch J2000.0):
[-0.438157, -0.082840, 0.144438] km/s
Spacecraft attitude quaternion at Epoch:
[0.80233458473516,-0.0045587133385773,0.19127506416775,0.56537799930505]
Spacecraft attitude Euler angles [3,1,3] at Epoch:
[18.365836945901,106.70972771623,19.016917501611] degrees
External torques: activated
External torque in body frame: [0.00002,0.00009,0.00002] Nm

CDMU Testing
No special set-up

DAY10:
System testing
No special set-up

S/C in pre-separation

Initial conditions for day 4, OD 139:
Epoch (UTC): 2008-12-16T07:00:00Z
Epoch(MJD2000): 3272.29
Spacecraft position (mean equatorial geocentric system of epoch J2000.0):
[-488097.305061, 1228271.919307, 417959.661752] km
Spacecraft velocity (mean equatorial geocentric system of epoch J2000.0):
[-0.426988, -0.093925, 0.141693] km/s
Spacecraft attitude quaternion at Epoch:
[0.8164311268819,-0.056082567294275,0.11733350371002,0.56260804261152]
Spacecraft attitude Euler angles [3,1,3] at Epoch:
[7.8507335949422,109.84093695484,15.709950230063] degrees
External torques: deactivated

Note: The Initial attitude equals the one for day 7, and is valid for at least one more day, when the alpha angle will still be only about 1 degree.

Overall, in summary it could be mentioned that the real units used during the SVT-1 will be: CDMU, ACC, PCDU, TRSPND2, TWTA2, RFDN switches and CCU , while other ACMS units, RCS ones and battery will be simulated. For more detailed S/C configuration during H-SVT-1 see Appendix 7.5 “Units in Use during Herschel SVT-1”

3.3.2 Onboard Software Configuration

The following on-board software configuration applies during the execution of the H-SVT-1:

CDMU: CDMU BSW 1.8
CDMU ASW 3.1.3 (version of the Flight Branch to be confirmed)

ACMS: ACC BSW 1.4
ACMS OBSW 3.7

Note: It's a prerequisite for the H-SVT-1 that the development schedule of the CDMU ASW (Flight Branch) allows proper testing via the HP AVM and through Herschel IST 1 prior to the conduct of the H-SVT-1.
As indicated by TAS during the Herschel Progress Meeting #46 in December 2007, the CDMU ASW 3.1.3 is assumed to be suitable for the conduct of IST1 and therefore for H-SVT-1. Potentially, a later version of the CDMU ASW (3.2?) may be issued during the conduct of the H-SVT-1; in this case the impact of differences of the software version against version 3.1.3 shall be clarified in advance to the H-SVT-1, latest during the H-SVT-1 Test Readiness Review.

3.3.3 EGSE and SCOE Configuration and Limitations

The system configuration and the limitations due to EGSE and SCOE configuration are as described in the Herschel IST Test Specification [RD 6]. TAS-I takes responsibility to consider those constraints during the review cycle of the SVT-1 procedures.

For the set-up of the EGSE and SCOE for each SVT-1 test day the default power-up sequences and AIT procedures will be used.

Special attention needs to be paid for the test set-up for test days which requires future simulated time in such a way that the AOCS SCOE supports the correctly dynamical behaviour for the ACMS pointings modes based on the information (orbital state vector, pointing attitude, mass properities) provided by MOC/Flight Dynamics.

4 TESTING CONSTRAINTS

4.1 Spacecraft Configuration Constraints and SCOE Configuration Constraints

The system configuration and the limitations due to EGSE and SCOE configuration are as described in the Herschel IST Test Specification [RD 6]. AAS-I takes responsibility to consider those constraints during the review cycle of the SVT-1 procedures.

4.2 Constraints due to Anomalies

TBD by TAS.

4.3 Communications Constraints

The Communication set-up is depicted in Figure 3: Test Configuration and Figure 5 Communications and LAN Configuration.

Constraints as outlined in the H-SVT-0 Test Plan [RD 1] due to the limitation of 256 kbps in available bandwidth and the fact that the NDIU-Lite (or NDIU-TMCS) is located at MOC, are not applicable for H-SVT-1. A line capacity of 512 kbps and the fact that the NDIU (both NDIU-IFMS and NDIU-TMTCS) represent the real ground station equipment allow operations of the Herschel Spacecraft in a realistic fashion. All bit rates may be exercised, no filtering on EGSE level of VCs (for instance idle frames VC7) for high bit rates is needed.

4.4 Restricted and Dangerous Commands

Restricted /dangerous commands, i.e. commands that are intrinsically dangerous or that should be prohibited due to restrictions / constraints in the test set up, are listed here below. These commands should be filtered by the CCS in order to ensure spacecraft safety.
TAS shall provide the list (in agreement with ESOC) and ensure implementation of the corresponding safety measures.

Note: No restricted/dangerous commands had been identified for H-SVT-0 [RD 1] [see Fax HP-ALS-06-0111; also reconfirmed during H-SVT-0 preparation telecon of 21st July 2006; MoM MS0607018-1).

For H-SVT1- the following constraints have been identified:

1. CRS stimulation with unit OFF;
2. RFDN SWs commands with TWT Amp ON;
3. 30 seconds constraint after two consecutive EHP commands are sent to any RFDN SW

Actions taken or to be taken to cope with dangerous commands identified above:

- conditions on relevant TCs have been already implemented to cope with points 1 and 2;
- point 3 is taken into account in autonomous procedures and TTC procedures

Note
In general all TCs acting on OP-LCLs need to be carefully verified before sending them to avoid any "undesired" equipments to change its status.
In particular actual LCLs status and current ASW internal configuration must be in line.
*This is particularly important soon after separation as FCVs LCLs are commanded by the RM and must be re-enforced **before** the RWs LCLs are commanded ON.*

5 TEST PROCEDURES

5.1 Initial Testing - TM and TC Link Test

This test will be executed each test day as s first activity after the spacecraft (i.e. TC capability) was handed over from EADS to MOC in order to verify proper TM and TC link.

Procedure Reference	Sequence Name	Description	Approx. Duration
H_SVT_DHS_1701	HVD_1701	Service 17 ConnTest	00:05:00

5.2 System Testing

Procedure Reference	Sequence Name	Description	Approx. Duration
Nominal Mode Transition Test		Transition from Launch to Sun Acquisition Mode to Nominal Mode (LEOP Sequence) **NOTE: depends on availability of input via industry procedures**	TBD

Procedure Reference	Sequence Name	Description	Approx. Duration
Recovery from DoD			
H_SVT_SYS_ANOM		**Herschel System Anomalies**	
H_SVT_SYS_SMI		**Herschel Survival Mode Investigation**	
H_SVT_SYS_DOD		**Herschel SVT-1 DoD Recovery**	
H_CVT_AOC_XA2C		**Recovery from SIR (ACMS SAM to SCM)**	
H_SVT_SYS_SA2N		**Herschel S/C Transition SAM to NOM**	

Total execution time estimated for System testing: TBD hours

5.3 CDMS Testing

Procedure Reference	Sequence Name	Description	Approx. Duration
Generic			
H_SVT_DHS_1503		Daily dump SSMM stores	02:00

Procedure Reference	Sequence Name	Description	Approx. Duration
Block 1			
H_SVT_DHS_1701		Connection Tests with CDMU. ACC and instruments	00:15
H_SVT_DHS_0302		Packet generation enable/disable	00:30
H_SVT_DHS_1501		Tests on packet store functionalities	04:00
H_FCP_DHS_3014		Dump and interpretation of CEL	00:45
H_SVT_DHS_0202		Pulse Mask register management - CPDU TC enabling/disabling	00:45
Block 2			
H_SVT_DHS_0000		Switch to AD mode plus connection test non MTL - COP-1 protocol init	00:10
H_SVT_DHS_1101		Start / Stop of the Scheduling function	00:50
H_SVT_DHS_1102		Complete MTL operations Test	05:00
H_SVT_DHS_CROM		Readout of CROME B Registers	01:15
Block 3			
H_SVT_DHS_0000		Switch to AD mode plus connection test non MTL - COP-1 protocol init	00:10
H_SVT_DHS_0101		Check generation and handling of TM(1,x)	00:40
H_SVT_DHS 8108		Event-Action function start/stop	00:40
H_SVT_DHS_1201		Test on On-board monitoring functionalities	03:30
H_SVT_DHS_1901		Test of Event/Action related functionalities	02:00
H_FCP_DHS_3081		Complete CDMU subsystem check	00:30
H_FCP_H_DHS_1011		MTL Uplink	00:30
Block 4			
H_SVT_DHS_0000		Switch to AD mode plus connection test non MTL - COP-1 protocol init	00:10
H_SVT_DHS_0901		CTR synchronization procedure	01:00
H_SVT_DHS_0902		Other Units Synchronization procedure	00:30
H_SVT_DHS_8109		TTR Board management test	01:30
H_SVT_DHS_8116		FDIR management ASW	03:30
H_SVT_DHS 8410		FDIR management BSW	01:00
Block 5			
H_SVT_DHS_0000		Switch to AD mode plus connection test non MTL - COP-1 protocol init	00:10
H_SVT_DHS_8420		Mass Memory Functions Test	03:00
H_SVT_DHS_1170		Event Filtering Test	01:50
H_SVT_DHS_8460		Bus Profile Operations Test	01:15
H_SVT_DHS_1801		Test on various OBCP related functionalities	01:30

Block 6 – OBSM Test Cases

These test activities shall be considered as a baseline minimum to be executed as part of the standard ESOC SVT-1 test schedule.

Test Case Reference		Procedure	Description	Duration (hrs:mins)
OBSM-01 Execute ESOC Test OBCP and associated OBCP management activities				**1:20**
1.1	OBCP Test (lead procedure)	SVT_DHS_1801	OBCP Test top level procedure	0:10

1.2	Load OBCP	H_FCP_OBS_7101	Load OBCP	0:03
1.3	Request OBCP status report	C_FCP_0BS_7112	Request OBCP status and parameters report	0:03
1.4	Dump OBCP code	H_FCP_OBS_7114	Dump OBCP contents using service 18	0:03
1.5	Request list of OBCPs	C_FCP_OBS_7108	Request list of loaded OBCPs	0:02
1.6	Request list of active OBCPs	C_FCP_OBS_7110	Request list of active OBCPs	0:02
1.7	Start OBCP	C_FCP_OBS_7103	Start OBCP execution	0:02
1.8	Request list of active OBCPs	C_FCP_OBS_7110	Request list of active OBCPs	0:02
1.9	Suspend OBCP	C_FCP_OBS_7105	Suspend OBCP execution	0:02
1.10	Resume OBCP	C_FCP_OBS_7106	Resume OBCP execution	0:02
1.11	Set OBCP parameters	C_FCP_OBS_7107	Communicate parameters to the test OBCP	0:02
1.12	Start, control and monitor OBCP execution	H_SVT_OBS_7100	Start, control and monitor execution of ESOC SVT1 Test OBCP	0:40
1.13	Stop OBCP	C_FCP_OBS_7104	Stop OBCP execution	0:02
1.14	Delete OBCP	H_FCP_OBS_7102	Delete OBCP on-board and on-ground	0:05
Test case OBSM-01 DESCOPED from H SVT-1				
OBSM-02 Systematic CDMU CROME register dumps				**0:20**
2.1	Dump CDMU CROME registers	H_FCP_OBS_1451	Dump CDMU CROME registers contents and update the OBSM ground image	0:20
OBSM-03 Systematic ACC CROME register dumps				**0:20**
3.1	Dump ACC CROME registers	H_FCP_OBS_2451	Dump ACC CROME registers contents and update the OBSM ground image	0:20
OBSM-04 ACC AGSA register dumps				**0:15**
4.1	Dump ACC AGSA registers	H_FCP_OBS_2447	Dump ACC AGSA registers contents and update the OBSM ground image	0:15
OBSM-05 Enable/Disable write to CPU and COCOS registers or EEPROM				**0:10**
5.1	Enable/Disable write to CDMU CPU and COCOS registers or EEPROM	C_CRP_OBS_1100	Enable/Disable write to CDMU CPU and COCOS registers or EEPROM - to exercise TC(8,4,7,1)	0:05
5.2	Enable/Disable write to ACC CPU and COCOS registers or EEPROM	C_CRP_OBS_2100	Enable/Disable write to ACC CPU and COCOS registers or EEPROM - to exercise TC(8,4,7,1)	0:05
OBSM-06 Enable/Disable write to ASW/BSW code and constants				**0:10**
6.1	Enable/Disable write to CDMU ASW/BSW code and constants	C_CRP_OBS_1102	Enable/Disable write to CDMU ASW/BSW code and constants - to exercise TC(8,4,7,2)	0:05
6.2	Enable/Disable write to ACC ASW/BSW code and constants	C_CRP_OBS_2102	Enable/Disable write to ACC ASW/BSW code and constants - to exercise TC(8,4,7,2)	0:05
OBSM-07 Memory load, dump, check and copy activities				**2:15**
7.1	Memory management activities for selected Platform memory devices (lead procedure)	H_SVT_OBS_8100	Lead procedure for memory write, dump, check and copy activities on selected memory devices (memory management activities for memory devices not addressed in other test cases in SVT1 Test Plan) Activities:	2:15

			a. CDMU PM EEPROM memory patch, dump, check and copy b. CDMU CPU RAM memory patch, dump, check and copy c. CDMU SGM memory dump and copy d. CDMU SSMM write, dump and copy e. ACC PM EEPROM memory patch, dump, check and copy f. ACC CPU RAM memory patch, dump, check and copy g. ACC SGM memory dump and copy h. STR EEPROM patch and dump i. STR RAM patch and dump	
7.2	CDMU PM EEPROM memory patch, dump, check and copy	H_SVT_OBS_1212	Execute CDMU PM EEPROM memory patch, dump, check and copy	0:15
7.3	CDMU CPU RAM memory patch, dump, check and copy	H_SVT_OBS_1214	Execute CDMU CPU RAM memory patch, dump, check and copy	0:15
7.4	CDMU SGM memory dump and copy	H_SVT_OBS_1449	Execute CDMU SGM memory dump and copy	0:15
7.5	CDMU SSMM write, dump and copy	H_FCP_OBS_1610	Execute CDMU SSMM write, dump and copy	0:15
7.6	ACC PM EEPROM memory patch, dump, check and copy	H_SVT_OBS_2212	Execute ACC PM EEPROM memory patch, dump, check and copy	0:15
7.7	ACC CPU RAM memory patch, dump, check and copy	H_SVT_OBS_2214	Execute ACC CPU RAM memory patch, dump, check and copy	0:15
7.8	ACC SGM memory dump and copy	H_SVT_OBS_2449	Execute ACC SGM memory dump and copy	0:15
7.9	STR EEPROM patch and dump **(patch TBC)**	H_SVT_OBS_2822	Execute STR EEPROM patch and dump **(patch TBC)**	0:15
7.10	STR RAM patch and dump	H_SVT_OBS_2824	Execute STR RAM patch and dump	0:15
Notes for Tast Case OBSM-07: 1. This test block is intended to be a complement to the other memory management related test blocks in the SVT1 Test Plan, i.e. meant to schedule memory management activities for memory devices not addressed in other test cases in SVT1 Test Plan.				
OBSM-08 CDMU software patch and restart with the new OBSW image				**0:30**
8.1	Patch CDMU OBSW in EEPROM	H_CRP_DHS_3035	Perform a standard patch on CDMU EEPROM (code and data)	0:30
Notes for Tast Case OBSM-08: 1. A "Standard patch" is requested whenever the CDMU OBSW has to be changed, either ASW or BSW, without mpacting the definitions of the data structures stored in SGM. This means that the SW can reboot using the critical data stored in SGM. 2. The procedure foresees to start the new uploaded SW image through a forced SW alarm (level 3 failure).				
OBSM-09 ACC software patch and restart with the new OBSW image				**0:30**
9.1	Patch ACC OBSW in EEPROM	P_CRP_ACM_xxxx	Perform a standard patch on ACC EEPROM (code and data)	0:30

Notes for Tast Case OBSM-09:
1. Industry procedure NOT available. Tets case might have to be DESCOPED.

OBSM-10 HIFI DPU OBS upload in instrument Rescue mode				**0:30**
10.1	Load HIFI DPU OBS in instrument Rescue mode	H_SVT_OBS_3100 H_FCP_HIF_NLBM H_FCP_OBS_3112	Load HIFI full OBS image in DPU DRAM and check (checksum calculation)	0:25
10.2	Dump HIFI DPU DRAM memory area	H_FCP_OBS_3144	Dump HIFI DPU DRAM memory area (dump small memory area in DPU DRAM)	0:05

Notes for Test Case OBSM-10:
1. H_SVT_OBS_3100 is the lead procedure for SVT-1 HIFI OBSM activities. It calls: H_FCP_HIF_NLBM, H_FCP_HIF_CLOM and H_FCP_HIF_CPOM
2. H_FCP_HIF_NLBM calls H_FCP_OBS_3112 for OBS upload
3. Step 10.2 has been introduced to exercise the dump of a small DPU DRAM memory area

OBSM-11 HIFI DPU OBS upload in instrument Intermediate mode				**0:30**
11.1	Load HIFI DPU OBS in instrument Intermediate mode	H_SVT_OBS_3100 H_FCP_HIF_CLOM H_FCP_OBS_3110	Load HIFI full OBS image in DPU PRAM and check (checksum calculation)	0:25
11.2	Dump HIFI DPU PRAM memory area	H_FCP_OBS_3142	Dump HIFI DPU PRAM memory area (dump small memory area in DPU PRAM)	0:05

Notes for Test Case OBSM-11:
1. H_SVT_OBS_3100 is the lead procedure for SVT-1 HIFI OBSM activities. It calls: H_FCP_HIF_CLOM, H_FCP_HIF_CLOM and H_FCP_HIF_CPOM
2. H_FCP_HIF_CLOM calls H_FCP_OBS_3110 for OBS upload
3. The checksum calculation and verification of OBS copy is included in both H_FCP_HIF_CLOM and H_FCP_OBS_3110
4. Step 11.2 has been introduced to exercise the dump of a small DPU PRAM memory area

OBSM-12 HIFI DPU OBS patch in instrument Intermediate mode				**0:30**
12.1	Patch HIFI DPU OBS in instrument Intermediate mode	H_SVT_OBS_3100 H_FCP_HIF_CPOM H_FCP_OBS_3111	Patch HIFI OBS in DPU PRAM memory and verify OBS image via memory check (checksum calculation)	0:30

Notes for Test Case OBSM-12:
1. H_SVT_OBS_3100 is the lead procedure for SVT-1 HIFI OBSM activities. It calls: H_FCP_HIF_CPOM, H_FCP_HIF_CLOM and H_FCP_HIF_CPOM
2. H_FCP_HIF_CPOM calls H_FCP_OBS_3122 for OBS patch
3. The checksum calculation and verification of the OBS copy is included in H_FCP_HIF_CPOM

OBSM-13 PACS DPU OBS upload in instrument RESCUE mode				**0:30**
13.1	Load PACS DPU OBS in instrument RESCUE mode	H_SVT_OBS_4100 H_FCP_PAC_NRDM H_FCP_OBS_4112	Load PACS DPU full OBS image in DPU DRAM and check (checksum calculation)	0:25
13.2	Dump PACS DPU DRAM memory area	H_FCP_OBS_4144	Dump PACS DPU DRAM memory area (dump small memory area in DPU DRAM)	0:05

Notes for Test Case OBSM-13:
1. H_SVT_OBS_4100 is the lead procedure for SVT-1 PACS OBSM activities. It calls: H_FCP_PAC_NRDM, H_FCP_PAC_NLDM, H_FCP_PAC_NLMM and H_FCP_PAC_NLSM
2. H_FCP_PAC_NRDM calls H_FCP_OBS_4112 for OBS upload
3. The checksum calculation and verification of OBS copy in DPU PRAM is included in H_FCP_PAC_NRDM
4. Step 13.2 has been introduced to exercise the dump of a small DPU DRAM memory area

OBSM-14 PACS DPU OBS upload in instrument INIT mode				**0:30**
14.1	Load PACS DPU OBS in instrument INIT mode	H_SVT_OBS_4100 H_FCP_PAC_NLDM H_FCP_OBS_4110	Load PACS DPU full OBS image in DPU PRAM and check (checksum calculation)	0:25
14.2	Dump PACS DPU PRAM memory area	H_FCP_OBS_4142	Dump PACS DPU PRAM memory area (dump small memory area in DPU PRAM)	0:05
Notes for Test Case OBSM-14: 1. H_SVT_OBS_4100 is the lead procedure for SVT-1 PACS OBSM activities. It calls: H_FCP_PAC_NRDM, H_FCP_PAC_NLDM, H_FCP_PAC_NLMM and H_FCP_PAC_NLSM 2. H_FCP_PAC_NLDM calls H_FCP_OBS_4110 for OBS upload 3. The checksum calculation and verification of OBS copy in DPU PRAM is included in both H_FCP_PAC_NLDM and H_FCP_OBS_4110 4. Step 14.2 has been introduced to exercise the dump of a small DPU PRAM memory area				
OBSM-15 PACS DMC OBS upload in instrument INIT mode				**0:30**
15.1	Load PACS DMC OBS in instrument INIT mode	H_SVT_OBS_4100 H_FCP_PAC_NLM M H_FCP_OBS_4310	Load PACS DMC full OBS image in DMC PRAM and check (checksum calculation)	0:25
15.2	Dump PACS DMC PRAM memory area	H_FCP_OBS_4342	Dump PACS DMC PRAM memory area (dump small memory area in DMC PRAM)	0:05
Notes for Test Case OBSM-15: 1. H_SVT_OBS_4100 is the lead procedure for SVT-1 PACS OBSM activities. It calls: H_FCP_PAC_NRDM, H_FCP_PAC_NLDM, H_FCP_PAC_NLMM and H_FCP_PAC_NLSM 2. H_FCP_PAC_NLMM calls H_FCP_OBS_4310 for OBS upload 3. The checksum calculation and verification of OBS copy in DMC PRAM is included in both H_FCP_PAC_NLMM and H_FCP_OBS_4310 4. Step 15.2 has been introduced to exercise the dump of a small DMC PRAM memory area				
OBSM-16 PACS SPU OBS upload in instrument INIT mode				**0:30**
16.1	Load PACS SPU OBS in instrument INIT mode	H_SVT_OBS_4100 H_FCP_PAC_NLSM H_FCP_OBS_4210	Load PACS SPU full OBS image in SPU-L and SPU-S EEPROM and check (checksum calculation)	0:25
16.2	Dump PACS SPU-L and SPU-S EEPROM memory areaS	H_FCP_OBS_4240	Dump PACS SPU-L and SPU-S EEPROM memory areaS (dump small memory areas in SPU-L and SPU-S EEPROM)	0:05
Notes for Test Case OBSM-16: 1. H_SVT_OBS_4100 is the lead procedure for SVT-1 PACS OBSM activities. It calls: H_FCP_PAC_NRDM, H_FCP_PAC_NLDM, H_FCP_PAC_NLMM and H_FCP_PAC_NLSM 2. H_FCP_PAC_NLSM calls H_FCP_OBS_4210 for OBS upload 3. The checksum calculation and verification of OBS copy in SPU-L and SPU-S EEPROM is included in both H_FCP_PAC_NLSM and H_FCP_OBS_4210 4. Step 16.2 has been introduced to exercise the dump of small SPU-L and SPU-S EEPROM memory areaS				
OBSM-17 SPIRE OBS upload from BSW				**0:30**
17.1	Load SPIRE OBS from BSW	H_SVT_OBS_5100 H_FCP_SPI_NLBM H_FCP_OBS_5112	Load SPIRE full OBS image into DPU DRAM and check (checksum calculation)	0:25
17.2	Dump SPIRE DPU DRAM memory area	H_FCP_OBS_5144	Dump SPIRE DPU DRAM memory area (dump small memory area in DPU DRAM)	0:05

Notes for Test Case OBSM-17: 1. H_SVT_OBS_5100 is the lead procedure for SVT-1 SPIRE OBSM activities. It calls: H_FCP_SPI_CLOM, H_FCP_SPI_CPOM and H_FCP_SPI_NLBM 2. H_FCP_SPI_NLBM calls H_FCP_OBS_5112 for OBS upload 3. Step 17.2 has been introduced to exercise the dump of a small DPU DRAM memory area				
OBSM-18 SPIRE OBS upload from ASW				**0:30**
18.1	Load SPIRE OBS from ASW	H_SVT_OBS_5100 H_FCP_SPI_CLOM H_FCP_OBS_5110	Load SPIRE full OBS image into DPU PRAM and check (checksum calculation)	0:25
18.2	Dump SPIRE DPU PRAM memory area	H_FCP_OBS_5142	Dump SPIRE DPU PRAM memory area (dump small memory area in DPU PRAM)	0:05
Notes for Test Case OBSM-18: 1. H_SVT_OBS_5100 is the lead procedure for SVT-1 SPIRE OBSM activities. It calls: H_FCP_SPI_CLOM, H_FCP_SPI_CPOM and H_FCP_SPI_NLBM 2. H_FCP_SPI_CLOM calls H_FCP_OBS_5110 for OBS upload 3. The checksum calculation and verification of OBS copy is included in H_FCP_OBS_5110 4. Step 18.2 has been introduced to exercise the dump of a small DPU PRAM memory area				
OBSM-19 SPIRE OBS patch from ASW				**0:30**
19.1	Patch SPIRE OBS in PM	H_SVT_OBS_5100 H_FCP_SPI_CPOM H_FCP_OBS_5111	Patch SPIRE OBS image in DPU PRAM and check (checksum calculation)	0:30
Notes for Test Case OBSM-19: 1. H_SVT_OBS_5100 is the lead procedure for SVT-1 SPIRE OBSM activities. It calls: H_FCP_SPI_CLOM, H_FCP_SPI_CPOM and H_FCP_SPI_NLBM 2. H_FCP_SPI_CPOM calls H_FCP_OBS_5110 for OBS upload 3. The checksum calculation and verification of OBS copy is included in H_FCP_OBS_5111				

Additional OBSM Test Activities - The additional test activities will be executed if there is available time in the ESOC test schedule and SPIRE OBSM procedures will be available in time for H-SVT-1 preparation.

Test Case Reference		Procedure	Description	Duration (hrs:mins)
OBSM-A01 SPIRE DPU RAM Dat/Prog dump				**0:15**
A1.1	Dump of SPIRE DPU RAM Dat memory (2MB x 32 bits) or SPIRE DPU RAM Prog memory (3MB x 48 bits)	H_SVT_OBS_1100	- to test HPMCS SPR -213 'Packets lost in image update or monitoring' - Low priority test, execution with the simulator representative but SPIRE model not yet available	0:15

Total execution time estimated for CDMS testing: TBD hours

5.4 ACMS Testing

Applicable procedure from industry (Name by proc delivery)	Title	Description	Sequences called	TOTAL TIME
	H-SVT-1_ACMS-DAY #1			**08:45**
		ACC switch on and health check	**AESEE_00**	00:00
		Separation and Startup	---	00:00
H_SVT_AOC_4S01	Make STR operational	Switch on STR	---	00:10
H_SVT_AOC_4S11/ H_SVT_AOC_8ON1	Make STR1 operational as main/ Make STR1 operational and configure mode		---	00:40
H_SVT_AOC_4S51	Memory dump for STR main		---	00:30
H_SVT_AOC_4S61	Patch memory of the main STR		---	00:30
H_SVT_AOC_4S51	Memory dump for STR main		---	00:30
H_SVT_AOC_4S71	Dump defective pixel table for STR main		---	00:30
H_SVT_AOC_4S51	Memory dump for STR main		---	00:30
H_SVT_AOC_4S81	Update parameters for STR main		---	00:30
H_SVT_AOC_4S71	Dump defective pixel table for STR main		---	00:30
H_SVT_AOC_4S51	Memory dump for STR main		---	00:30
H_SVT_AOC_4S52	Memory dump for STR red		---	00:30
H_SVT_AOC_4S62	Patch memory of the redundant STR		---	00:30
H_SVT_AOC_4S52	Memory dump for STR red		---	00:30
H_SVT_AOC_4S21 / H_SVT_AOC_8ON2	Make STR2 operational as main/ Make STR2 operational and configure mode		---	00:30
H_SVT_AOC_4S81	Update parameters for STR main		---	00:30
H_SVT_AOC_4S71	Dump defective pixel table for STR main		---	00:30
H_SVT_AOC_4S51	Memory dump for STR main		---	00:30
H_SVT_AOC_SPRO	Special SVT1 procedure (use Day1 branch)	Coarse-to-Fine in SAM (TC_SET_RCS_CONTROL_MODE)	---	00:05
H_SVT_AOC_3O02	Procedure for Entry into Herschel OCM for first delta-V	Transition SAM --> OCM	---	00:10
H_SVT_AOC_3M03	Update Sun Earth ephemerides		**AESEE_00**	00:10
H_SVT_AOC_3O01	Delta V		**AEOFP_00**	00:10

Applicable procedure from industry (Name by proc delivery)	Title	Description	Sequences called	TOTAL TIME
	H-SVT-1_ACMS-DAY #2			**09:09**
H_SVT_AOC_4R14	Declare the RWS Functional	Declare Wheels operational	**AERWL_00**	00:15
H_SVT_AOC_4R34	Perform RWL run-in	Run in wheels	**---**	00:30
H_SVT_AOC_4R44	Update RWL misalignment		**AERWA_00**	00:15
H_SVT_AOC_SPRO	Special SVT1 procedure (use Day2 branch)	Coarse-to-Fine in OCM (TC_SET_RCS_CONTROL_MODE)	**---**	00:05
H_SVT_AOC_3O02	Procedure for Entry into Herschel OCM for first delta-V	Execution slew of 10 - 20 deg. OCM pointing. Execution of 1st DV (Optional: execution and abort of 2nd DV)	**---**	00:10
H_SVT_AOC_4S41	Update S/C orbital velocity in STR		**AESVV_00**	00:10
H_SVT_AOC_3O01	Delta V		**AEOFP_00 + AEDVH_00**	00:10
H_SVT_AOC_3011	ERD buffer dump		**---**	00:10
H_SVT_AOC_3O01	Delta V		**AEDVH_00**	00:10
H_SVT_AOC_SPRO	Special SVT1 procedure (use Day2 branch)	Abort OCM (TC_ABORT_CURRENT_DELTAV)	**---**	00:05
H_SVT_AOC_SPRO	Special SVT1 procedure (use Day2 branch)	Coarse-to-Fine in OCM (TC_SET_RCS_CONTROL_MODE)	**---**	00:05
H_SVT_AOC_3S07	Procedure for Entry into Herschel SCM for the first time	Transition SAM --> SCM	**---**	00:10
H_SVT_AOC_3S01	Perform SCM Fine Pointing		**AESFP_00**	00:10
H_SVT_AOC_3001	Verify SCM Configuration	Verify SCM configuration	**---**	00:15
H_SVT_AOC_5004	Maintenance phase of 1 day period		**---**	00:15
H_SVT_AOC_3M03	Update Sun Earth ephemerides	Update sun earth ephemerides	**AESEE_00**	00:15
H_SVT_AOC_4R20	Perform RWS Biasing	Perform Wheel Biasing	**AERWB_00**	00:15
H_SVT_AOC_3S01	Fine pointing	Long stable poin for g.bias calibration. During the first 30 min of this pointing the gyro drift is estimated and uploaded on the S/C. More accurate estimation, based on the full hour of data from this stable pointing will be used for the upload on day #3	**AESFP_00**	00:40
H_SVT_AOC_1GDR	Gyro Drift Calculation and update	Calculation of the Gyro Drift estimate and upload of the new value onboard.	**AEGDR_00**	00:20
H_SVT_AOC_3S01	Fine pointing	Perform sequence of 10 Slews and consequent Fine pointing to support calibration procedures execution	**AESFP_00**	00:14
H_SVT_AOC_3S01	Fine pointing		**AESFP_00**	00:16
H_SVT_AOC_3S01	Fine pointing		**AESFP_00**	00:16
H_SVT_AOC_3S01	Fine pointing		**AESFP_00**	00:14
H_SVT_AOC_3S01	Fine pointing		**AESFP_00**	00:14
H_SVT_AOC_3S01	Fine pointing		**AESFP_00**	00:14
H_SVT_AOC_3S01	Fine pointing		**AESFP_00**	00:14
H_SVT_AOC_3S01	Fine pointing		**AESFP_00**	00:16
H_SVT_AOC_3S01	Fine pointing		**AESFP_00**	00:16
H_SVT_AOC_3S01	Fine pointing		**AESFP_00**	00:16
H_SVT_AOC_3S04	Command Peak-up	Execute Peak up manoeuvre	**AEPUP_00**	00:16
H_SVT_AOC_3S01	Fine pointing		**AESFP_00**	00:16
H_SVT_AOC_3S01	Fine pointing		**AESFP_00**	00:16
	HIFI Peek-up simulation			00:05
H_SVT_AOC_3S01	Fine pointing		**AESFP_00**	00:16
H_SVT_AOC_3S05	Command SSO Tracking	Execute Solar Object Tracking	**AETRK_00**	00:05
H_SVT_AOC_3S01	Fine pointing		**AESFP_00**	00:20
H_SVT_AOC_3S02	Raster pointing	Perform Raster Pointing	**AERAS_00**	00:20
H_SVT_AOC_3S03	Scan	PerformLine Scan	**AELSC_00**	00:20

Applicable procedure from industry (Name by proc delivery)	Title	Description	Sequences called	TOTAL TIME
H-SVT-1_ACMS-DAY #3 - Part 1: On Board Updates and Mode Transitions Dis				04:55
H_SVT_AOC_SPRO	Special SVT1 procedure (TBD)	Enable DTM for SPID=240006990 (assumes STR1 & STR2 switch ON by AIT)	---	
H_SVT_AOC_3S01	Fine pointing	A stable pointing is achieved in 10 minutes and then maintained for about 2 hours, to give enough data in order to well estimate disturbance torques effects on the S/C. In principle also a long and slow slew crossing different pitch attitudes can be used	**AESFP_00**	00:10
H_SVT_AOC_1GDR	Update GYR drift after calibration	Enhanced estimate of the gyro drift is available at beginning of day #3 since data of the full 1h stable pointing executed in day #2 have been postprocessed. Therefore new upload of the estimated gyro drift is performed.	**AEGDR_00**	00:20
H_SVT_AOC_1GSM	Update GYR scale factor and misalignment		**AEGSM_00**	00:20
H_SVT_AOC_3M01	Procedure for ARAD thresholds Modification		**---**	00:00
H_SVT_AOC_4C01	Update CRS ARAD thresholds		**AEARA_00**	00:20
H_SVT_AOC_4S41	Update S/C orbital velocity in STR (based on nominal orbit)	update SC velocity in the STR	**AESVV_00**	00:15
H_SVT_AOC_4S41	Update S/C orbital velocity in STR (test to observe effect on quaternion)	update SC velocity in the STR	**AESVV_00**	00:15
H_SVT_AOC_3A01	OCM or SCM to SAM	Transition SCM --> SAM	**---**	00:20
H_SVT_AOC_3S07	Procedure for Entry into Herschel SCM for the first time	Transition SAM --> SCM	**---**	00:10
H_SVT_AOC_3S01	Perform SCM Fine Pointing		**AESFP_00**	00:10
H_SVT_AOC_3O03	Procedure for Herschel Delta-V Maneuvers	Transition SCM --> OCM	**AEOFP_00**	00:05
H_SVT_AOC_3A01	OCM or SCM to SAM	Transition OCM --> SAM	**---**	00:20
H_SVT_AOC_3M02	Update Control Parameters - inertia related		**AESCI_00**	00:20
H-SVT-1_ACMS-DAY #3 Part 2: Contingency recovery procedures.				
H_CRP_AOC_40S1	Herschel survival mode to nominal modes transition		**---**	01:00
H_CRP_AOC_4001	ACC RM Enable/Disable		**---**	00:10
H_CRP_AOC_4G01	Procedure for GYR electronics reconfiguration		**---**	00:20
H_CRP_AOC_4S01	Procedure for STR reconfiguration		**---**	00:20

Applicable procedure from industry (Name by proc delivery)	Title	Description	Sequences called	TOTAL TIME
H-SVT-1_LEOP-DAY #4 (based upon SUM, Chapter 3, System Level Operatio				**06:55**
	System level activities (Nominal LEOP)			02:00
H_SVT_AOC_3000	ACMS health check	Execution slew of 10 - 20 deg. OCM pointing, Execution of 1st DV (Optional: execution and abort of 2nd DV)	**---**	00:00
H_SVT_AOC_5007	STR health check		**---**	00:00
H_SVT_AOC_5008	CRS health check		**---**	00:00
H_SVT_AOC_5009	SAS health check		**---**	00:00
H_SVT_AOC_5010	AAD health check		**---**	00:00
H_SVT_AOC_5011	RCS Health Check		**---**	00:00
H_SVT_AOC_5012	ACC Health Check		**---**	00:00
H_SVT_AOC_5013	GYR health check		**---**	00:00
H_SVT_AOC_5014	RWL health check		**---**	00:00
H_SVT_AOC_3O02	Procedure for Entry into Herschel OCM for first delta-V	Execution slew of 10 - 20 deg. OCM pointing, Execution of 1st DV (Optional: execution and abort of 2nd DV)	**---**	00:00
H_SVT_AOC_4S01	Make STR operational	Switch on STR	**---**	00:10
H_SVT_AOC_4S11/ H_SVT_AOC_8ON1	Make STR1 operational as main/ Make STR1 operational and configure mode		**---**	00:40
H_SVT_AOC_4S41	Update S/C orbital velocity in STR	update SC velocity in the STR	**AESVV_00+ AEOVV_00**	00:10
H_SVT_AOC_3M03	Update Sun Earth ephemerides	Update sun earth ephemerides	**AESEE_00**	00:10
H_SVT_AOC_3O01	Transition to OCM	Execution slew of 10 - 20 deg. OCM pointing, Execution of 1st DV,(Optional: execution and abort of 2nd DV)	**AEOFP_00**	00:10
	System level activities (Contingency DoD Recovery)			02:00
H_CRP_AOC_XA2C	Recovery from SIR			00:10
H_SVT_AOC_4S01	Make STR operational	Switch on STR	**---**	00:10
H_SVT_AOC_4S11/ H_SVT_AOC_8ON1	Make STR1 operational as main/ Make STR1 operational and configure mode		**---**	00:40
H_SVT_AOC_4S41	Update S/C orbital velocity in STR	update SC velocity in the STR	**AESVV_00+ AEOVV_00**	00:10
H_SVT_AOC_3M03	Update Sun Earth ephemerides	Update sun earth ephemerides	**AESEE_00**	00:10
H_SVT_AOC_4R14	Declare the RWS Functional	Declare Wheels operational	**AERWL_00**	00:15

Total execution time estimated for ACMS testing: TBD

5.5 TT&C Testing

The procedure list does not provide the order of test execution. The TT&C Testing Timeline master procedure will include the calls to the individual test procedures in a logical order.

The list of TT&C procedures comprises, in comparison to the tests conducted during the H-SVT-0, (i) a set of new procedures, (ii) a set of procedures already run in SVT-0 but need to be re-run (due to NCR or procedure update) and (iii) procedures already run successfully listed again for regressing tests. The later are potential candidates for de-scoping should time not allow running the complete list of procedures.

The TT&C test are grouped in two blocks: block 1 shall be executed via RF (i.e. via the RF SCOE), while block 2 shall be executed via umbilical. If SVT test day 6, that is when the TT&C test block 2 is scheduled, MSTACK is not used for other operations (currently foreseen as “spare day for STACK2”), then test block may be executed via RF as well.

TTC&C BLOCK 1 Testing (via RF)

Procedure Reference	Sequence Name	Description	Approx. Duration [min]

H_SVT_TTC_TL HSVT1 TT&C Testing Timeline		The objective of this procedure is to provide the SVT1 Timeline for the TT&C S/S Testing	40 (shared between all TTC test)
H_SVT_TTC_CHECK TTC Start-up Configuration Verification		The objective of this test is the verification of the TTC nominal and redundant downlink branch and the TTC relevant entries in on board tables (FCCT, MOT and EAT) at its test start-up condition.	40
H_SVT_TTC_TTC1 TTC nominal modes		The objective of this test is to switch to specific TTC nominal operational mode, setting the D/L path, U/L path TM rate, TC rate and downlink of HK packets, for a certain S/C configuration: Nominal TC rate 4/125, TM rate 150 kbps, Tx MGA , Rx MGA (LGA1) Sun sep TC rate 4/125, TM rate 5 kbps, Tx LGA1, Rx LGA1 (LGA 2) SurvivalTC rate 125bps,TM rate 500 bps, Tx LGA1, Rx LGA1 (LGA2) Sun TC rate 125bps,TM rate 500 bps, Tx LGA1, Rx LGA1 (MGA) Note: Considering nominal the branch composed by XPND1 and TWTA1. This test calls to the XPND1 and TWTA1 tool box procedures described bellow	200
H_SVT_TTC_TTC2 TTC redundant modes		The objective of this test is to switch to specific TTC redundant operational mode, setting the D/L path, U/L path TM rate, TC rate and downlink of HK packets, for a certain S/C configuration: Nominal TC rate 4/125, TM rate 150 kbps, Tx MGA , Rx MGA (LGA1) Sun sep TC rate 4/125, TM rate 5 kbps, Tx LGA1, Rx LGA1 (LGA2) SurvivalTC rate 125bps,TM rate 500 bps, Tx LGA1, Rx LGA1 (LGA2) Sun TC rate 125bps,TM rate 500 bps, Tx LGA1, Rx LGA1 (MGA) Note: Considering redundant the branch composed by XPND2 and TWTA2. This test calls to the XPND2 and TWTA2 tool box procedures described bellow	200
H_SVT_TTC_DTCP DTCP TTC activities		The objective of this test is performing the sequence of TTC activities to be done by MTL and ground during a typical DTCP. Note: This test calls to the XPND and TWTA in use tool box procedures described bellow.	30
H_SVT_TTC_MANG Start/Stop TTC Management function		The objective of this test is to verify the ASW command Start/Stop TTC Management used for switching on/off the function.	3 (to be executed twice)

H_SVT_TTC_REPO TTC Management Status Report		The objective of this test is to acquire the status and information of the ASW function "TTC Management"	6
H_SVT_TTC_SWX Configure RFDN switches		The objective of this procedure is to configure the RFDN switches in order to achieve a specific configuration	10
H_SVT_TTC_T101 Switch ON TX1 and TWTA1		The objectives of this procedure is to switch ON the transmitter 1 and the travelling wave tube assembly 1 (nominal downlink branch) via TTC Management	25
H_SVT_TTC_T201 Switch ON TX2 and TWTA2		The objectives of this procedure is to switch ON the transmitter 2 and the travelling wave tube assembly 2 (redundant downlink branch) via TTC Management	25
H_SVT_TTC_TU01 Switch ON TX and TWTA in use		The objectives of this procedure is to switch ON the transmitter and the travelling wave tube assembly in use.	25
H_SVT_TTC_T100 Switch OFF TX1 and TWTA1		The objectives of this procedure is to switch OFF the transmitter 1 and the travelling wave tube assembly 1 (nominal downlink branch) via TTC Management	12
H_SVT_TTC_T200 Switch OFF TX2 and TWTA2		The objectives of this procedure is to switch OFF the transmitter 2 and the travelling wave tube assembly 2 (redundant downlink branch) via TTC Management	12
H_SVT_TTC_TU00 Switch OFF TX and TWTA in use		The objectives of this procedure is to switch OFF the transmitter and the travelling wave tube assembly in use.	12
H_SVT_TTC_T1HR TX1 and TM encoder configuration for HR		The objective of this procedure is to set change the transmitter 1 TM bit rate to 1.5 Mbps.	8
H_SVT_TTC_T2HR TX2 and TM encoder configuration for HR		The objective of this procedure is to set change the transmitter 2 TM bit rate to 1.5 Mbps.	8
H_SVT_TTC_TUHR TX and TM encoder in use configuration for HR		The objective of this procedure is to change the transmitter in use TM bit rate to 1.5 Mbps.	8
H_SVT_TTC_T1MR TX1 and TM encoder configuration for MR		The objective of this procedure is to configure the transmitter 1 to change the TM bit rate to 150 kbps.	6
H_SVT_TTC_T2MR TX2 and TM encoder configuration for MR		The objective of this procedure is to configure the transmitter 2 to change the TM bit rate to 150 kbps.	6
H_SVT_TTC_TUMR TX and TM encoder in use configuration for MR		The objective of this procedure is to configure the transmitter in use to change the TM bit rate to 150 kbps.	6

H_SVT_TTC_T1L2 TX1 and TM encoder configuration for LR2		The objective of this procedure is to configure the Transmitter 1 to change the TM bit rate to 5 kbps.	6
H_SVT_TTC_T2L2 TX2 and TM encoder configuration for LR2		The objective of this procedure is to configure the transmitter 2 to change the TM bit rate to 5 kbps.	6
H_SVT_TTC_TUL2 TX and TM encoder in use configuration for LR2		The objective of this procedure is to configure the transmitter in use to change the TM bit rate to 5 kbps.	6
H_SVT_TTC_T1L1 TX1 and TM encoder configuration for LR1		The objective of this procedure is to configure the transmitter 1 to change the TM bit rate to 500 bps.	6
H_SVT_TTC_T2L1 TX2 and TM encoder configuration for LR1		The objective of this procedure is to configure the transmitter 2 to change the TM bit rate to 500 bps.	6
H_SVT_TTC_TUL1 TX and TM encoder in use configuration for LR1		The objective of this procedure is to configure the transmitter in use to change the TM bit rate to 500 bps.	6
H_SVT_TTC_T1CM Transponder 1 Coherent Mode Activation/Deactivation		The objective of this procedure is to activate or deactivate coherent mode of the RF-S TTC link for the transponder 1.	3
H_SVT_TTC_T2CM Transponder 2 Coherent Mode Activation/Deactivation		The objective of this procedure is to activate or deactivate coherent mode of the RF-S TTC link for the transponder 2.	3
H_SVT_TTC_TUCM Transponder in use Coherent Mode Activation/Deactivation		The objective of this procedure is to activate or deactivate coherent mode of the RF-S TTC link for the transponder in use.	3
H_SVT_TTC_T1RM Transponder 1 Ranging Activation/ Deactivation		The objective of this procedure is to activate or deactivate ranging capability of the RF-S TTC link for the Transponder 1.	3
H_SVT_TTC_T2RM Transponder 2 Ranging Activation/ Deactivation		The objective of this procedure is to activate or deactivate ranging capability of the RF-S TTC link for the Transponder 2.	3
H_SVT_TTC_TURM Transponder in use Ranging Activation/ Deactivation		The objective of this procedure is to activate or deactivate ranging capability of the RF-S TTC link for the Transponder in use.	3
H_SVT_TTC_R1BR Select RX1 TC bit rate		The objective of this procedure is select the TC uplink bit rate (high or low) on the receiver 1 (nominal RX).	7 (to be executed twice)
H_SVT_TTC_R2BR Select RX2 TC bit rate		The objective of this procedure is select the TC uplink bit rate (high or low) on the receiver 2 (redundant RX).	7 (to be executed twice)

H_SVT_TTC_RUBR Select RX in use TC bit rate		The objective of this procedure is select the TC uplink bit rate (high or low) on the receiver in use.	7 (to be executed twice)
H_SVT_TTC_T10X Configure TX1		The objective of this procedure is to configure the transmitter 1 (with values different from the nominal ones), when the downlink is already active.	16 (to be executed twice)
H_SVT_TTC_T20X Configure TX2		The objective of this procedure is to configure the transmitter 2 (with values different from the nominal ones), when the downlink is already active.	16 (to be executed twice)
H_SVT_TTC_TU0X Configure TX in use		The objective of this procedure is to configure the transmitter in use with values different from the nominal ones, when the downlink is already active.	16 (to be executed twice)

Total execution time estimated for TTC Block 1 testing: 8 hours

TTC&C BLOCK 2 Testing via umbilical

Procedure Reference	Sequence Name	Description	Approx. Duration [min]
H_SVT_TTC_ENCR Reset TM Encoder		The objective of this test is to reset the TM encoder which shall restart the frame generator (any remaining packets in the TME input buffers will be lost).	10
H_SVT_TTC_T21 Swichover from chain 2 to 1		The objective of this test is to switch from the transmitter 2 and the travelling wave tube assembly 2 to the transmitter 1 and the travelling wave tube assembly 1	35
H_SVT_TTC_T12 Swichover from chain 1 to 2		The objective of this test is to switch from the transmitter 1 and the travelling wave tube assembly 1 to the transmitter 2 and the travelling wave tube assembly 2	35
H_SVT_TTC_T10R Switch to chain 1 after XPND1 or TWTA1 failure		The objective of this test is to switch ON the transmitter 1 and the travelling wave tube assembly 1 after an onboard TTC-S switchover.	35
H_SVT_TTC_T20R Switch to chain 2 after XPND2 or TWTA2 failure		The objective of this test is to switch ON the transmitter 2 and the travelling wave tube assembly 2 after an onboard TTC-S switchover.	35

H_SVT_TTC_TTCF Force XPND or TWTA Failure		This procedure describes the steps needed to force a TTC-S configuration recovery (TTC chain switchover) performed on-board by the ASW (through the Event-Action Table, EAT) due to: 1) XPND1 1553 Invalid RT, triggered by the SDB DLL FDIR OR 2) EPC2 Helix Current Out Of Limits; detected through the Monitoring Table (MOT)	35 (to be executed twice)
H_SVT_TTC_TTCR Configuration check after XPNDs or TWTAs failure		This procedure describes the steps needed to check the TTC-S configuration after the recovery (TTC chain switchover) performed on-board by the ASW through the EAT following: 1) BSW TM (5,2,160/161)(XPND1/2 1553 Invalid RT, event ID 0x00A0/00A1) triggered by the SDB DLL FDIR; 2)Event IDs 0x9218/19/28/29 (EPC1/2 Helix Current Out Of Limits) detected through the Monitoring Table (MOT); 3) Event IDs 0x921A/1B (RX1/2 Supply Power Out Of Limits) detected through the MOT and the FDIR Cross Correlated Table (FCCT).	120 (to be executed twice)
H_SVT_TTC_SWPF Force RFDN SWs failure		The objective of this procedure is to force an unexpected RFDN SW position.	45
H_SVT_TTC_SWPR Configuration check after RFDN SWs failure		The objective of this procedure is to check the RFDN SWs configuration after the recovery performed on-board by the ASW in case of an unexpected SW position.	30
H_SVT_TTC_SWRB Roll back after RFDN SWs failure		The objective of this procedure is to change the RFDN configuration in Unit In Use (UIU) table after an RFDN SWs failure recovered on-board.	30
H_SVT_TTC_SWXF Antenna switching		The objective of this procedure is to change the RFDN SWs position using service 2 TCs.	15

Total execution time estimated for TTC Block 2 testing: 7 hours

5.6 Power Testing

The procedure list does not provide the order of test execution. The EPS Testing Timeline master procedure will include the calls to the individual test procedures in a logical order.

The list of EPS procedures comprises, in comparison to the tests conducted during the H-SVT-0, (i) a set of new procedures, (ii) a set of procedures already run in SVT-0 but need to be re-run (due to NCR or procedure update) and (iii) procedures already run successfully listed again for regressing tests. The later are potential candidates for de-scoping should time not allow running the complete list of procedures.

Procedure Reference	Sequence Name	Description	Approx. Duration [min]
H_SVT_EPS_TL HSVT-1 EPS Testing Timeline		The objective of this procedure is to provide the SVT1 Timeline for the Power S/S Testing.	35
H_SVT_EPS_CHECK PCS Start-up Configuration Verification		The objective of this test is the verification of the PCDU at its HSVT1 Power testing start-up condition.	40
H_SVT_EPS_LCL2 LCL Switching via HPC and HLC		The objective of this test is to Switching LCLs 46 & 48 ON/OFF via HPC and HLC.	20
H_SVT_EPS_LCLC LCL commandability		The objective of this test is to verify the interaction between 1553 and high level LCL switching commands. The OPLCLs 46 will be commanded ON/OFF via direct commands and via 1553 S/C bus commands.	30
H_SVT_EPS_LCLR LCL Recovery after survival mode		The objective of this procedure is to re-inforce the switch OFF of all NE LCLs related to instrument via PCDU management	20
H_SVT_EPS_IFNR Switchover from N to R TMTC		The objective of this test is to switch from the nominal to the redundant PCDU TMTC module.	15
H_SVT_EPS_IFRN Switchover from R to N TMTC		The objective of this test is to switch from the redundant to the nominal PCDU TMTC module.	15
H_SVT_EPS_EOC Set EoC level		The objective of this test is to set the battery End of Charge (EoC) value.	6 (to be executed twice)
H_SVT_EPS_DOD Set DoD voltage threshold		The objective of this test is to set the battery Depth of Discharge (DoD) threshold.	6 (to be executed 8 times)
H_SVT_EPS_BCR Enable or disable BCRs		The objective of this test is to switch OFF/ON the BCRs.	20
H_SVT_EPS_BDR DRs APS and Input switch ONOFF		The objective of this test is to reset the Auxiliary Power Supply (APS) and/or Input Switch (IS) of BDR 1/2.	20
H_SVT_EPS_NCA NCA activation		The objective of this test is to trigger the NCA activation.	20
H_SVT_EPS_MANG		The objective of this test is to verify the ASW command	3

Start/Stop PCDU Management function		Start/Stop PCDU Management used for switching on/off the function.	(to be executed twice)
H_SVT_EPS_REPO PCDU Management Status Report		The objective of this test is to acquire the status and information of the ASW function "PCDU Management".	6
H_SVT_EPS_DNLR DNEL reset		The objective of this procedure is to reset the DNEL (Disconnect Non Essential Load).	**5**
H_SVT_EPS_IFF Force PCDU 1553 bus failure		This procedure describes the steps needed to force PCDU 1553 bus failure.	**15** (to be executed twice)
H_SVT_EPS_IFR Configuration check after PCDU 1553 bus failure		This procedure describes the steps needed to conduct a configuration check after the recovery (TMTC switchover) performed onboard by the ASW (through the Event-Action table) following a BSW TM (5,2,157)(PCDU 1553 Invalid RT, event ID Ox009D) triggered by the SDB DLL FDIR.	**50** (to be executed twice)
H_SVT_EPS_IF5R Switch to TMTC N after PCDU 1553 bus failure		This procedure describes the steps needed to switch from the redundant (RT 6) to the nominal PCDU TMTC module (RT 5) after an on-board PCDU switchover.	25
H_SVT_EPS_IF6R Switch to TMTC R after PCDU 1553 bus failure		This procedure describes the steps needed to switch from the nominal (RT 5) to the redundant PCDU TMTC module (RT 6) after an on board PCDU switchover.	25

Total execution time estimated for EPS testing: 06:00 hours

5.7 Thermal Testing

The procedure list does not provide the order of test execution. The Thermal Testing Timeline master procedure will include the calls to the individual test procedures in a logical order.

The list of Thermal procedures comprises, in comparison to the tests conducted during the H-SVT-0, (i) a set of new procedures, (ii) a set of procedures already run in SVT-0 but need to be re-run (due to NCR or procedure update) and (iii) procedures already run successfully listed again for regressing tests. The later are potential candidates for de-scoping should time not allow running the complete list of procedures.

Thermal testing is spited into three parts:
- TCS (Thermal control subsystem),
- Mirrors Decontamination,
- LOU Baffle Decontamination.

TCS BLOCK 1 testing

Procedure Reference	Sequence Name	Description	Approx. Duration [min]
H_SVT_TCS_TL HSVT-1 Thermal S/S Testing Timeline		The objective of this procedure is to provide the SVT1 Timeline for the Thermal S/S (Thermal control and Decontamination heating) Testing.	60 (shared between all TCS test)
H_SVT_TCS_CHECK TCS Subsystem Checkout		The objective of this test is the verification of the status of all the thermal control loops (heater lines and thermistors), the TCT content and the TCS relevant entries in on board tables (FCCT, MOT, EAT and TCT) at its test start-up condition.	60
H_SVT_TCS_CLNR Control loop Reconfiguration from Nominal to Redundant		The objective of this test is to switch from the nominal to the redundant Heater Control Loop by ground telecommands.	20
H_SVT_TCS_CLRN Control loop Reconfiguration from Redundant to Nominal		The objective of this test is to switch from the redundant to the nominal Heater Control Loop by ground telecommands.	20
H_SVT_TCS_HCS HCS Switching		The objective of this test is to switch ON/OFF the HCSs that correspond to Grp1 to Grp9.	25

Total execution time estimated for TCS Block 1 of Thermal testing: 2 hours (to be executed after EPS testing)

TCS BLOCK 2 testing

Procedure Reference	Sequence Name	Description	Approx. Duration [min]
H_SVT_TCS_TCT		The objective of this test the handling the TCT maintenance	25

Thermal Control Table maintenance		that is to perform one of the following actions: - Disable Control Loop - Enable Control Loop - Modify Temperature Thresholds - Modify Monitored Thermistors Parameter - Modify Temperature Monitoring Frequency - Modify FDIR unit Id - Modify (Nominal and redundant) - Modify Class B parameters	(to be executed 4 times)
H_SVT_TCS_MANG Start/Stop Thermal Control function		The objective of this test is to verify the ASW command Start/Stop Thermal Control used for switching on/off the function.	3 (to be executed twice)
H_SVT_TCS_REPO Thermal Control Status Report		The objective of this test is to acquire the status and information of the ASW function "Thermal Control"	6
H_SVT_TCS_THMR Configuration check after thermistor failure		The objective of this test is to conduct the checks to be performed after an onboard detection of a thermal control loop thermistor failure. In case the failure of this thermistor is confirmed the Ground may choose to remove it from the thermal control loop by modifying the settings in the Thermal Control Table.	20
H_SVT_TCS_CLF Force Control loop failure		The objective of this test is to force a thermal Control loop failure which results in the switch to the redundant Heater group.	5
H_SVT_TCS_CLR Configuration check after thermal control loop failure		The objective of this test is the checks to be performed after an onboard detection of a thermal control loop failure.	20
H_SVT_TCS_CLRB Roll back after thermal control loop on board reconfiguration		The objective of this test is to perform the roll back (undo) the on-board reconfiguration triggered after an on-board detection of a thermal control loop failure.	20
H_SVT_TCS_HCF Force HCS high dissipation detection and (mimic) protection activation		The objective of this test is to force an onboard detection of HCSs high dissipation failure. In case the related action defined in the on-board EAT is enabled, it triggers the enabling of the thermal protection for this group; but does not actually reconfigure anything.	15
H_SVT_TCS_HCR Configuration check after HCS high dissipation detection		The objective of this test is to conduct the checks to be performed after an onboard detection of HCSs high dissipation failure. This failure occurs when the temperature measured for a given Heater Group exceeds its limit.	20
H_SVT_TCS_HCPR Reset Heater Group protection		The objective of this test is to reset the on-board protection against high dissipation of HCS. Once this protection has been fired in order to reset it the HPS needs to be commanded OFF before being commanded ON.	15

H_SVT_TCS_HCNR Heater Group reconfiguration after failure of the Nominal one		The objective of this test is to perform the reconfiguration from the failed Nominal Heater Group to the Redundant one.	40 (to be executed twice)

Total execution time estimated for TCS Block of Thermal testing: 4 hours

Mirrors Decontamination testing

Procedure Reference	Sequence Name	Description	Approx. Duration [min]
H_SVT_DEC_DHP Decontamination Heating parameters Update		The objective of this test is to verify the ASW command to Modify the Decontamination Heating Parameters.	15
H_SVT_DEC_DEC1 Start Decontamination		The objective of this test is to start the decontamination heating. Note: Herschel decontamination function uses thermistors that are provided by the CCU. Therefore this test requires CCU on and CCU monitoring active.	25
H_SVT_DEC_DEC0 Stop Decontamination		The objective of this test is to stop the decontamination heating.	10
H_SVT_DEC_REPO Decontamination Heating Status Report		The objective of this test is to acquire the status and information of the ASW function "Decontamination Heating".	6

Total execution time estimated for Decontamination Block of Thermal testing: 1 hours

LOU Baffle Decontamination testing

Procedure Reference	Sequence Name	Description	Approx. Duration [min]
H_SVT_LOU_PRM LOU Baffle Temperature Thresholds update		The objective of this test is to verify the ASW command to modify the LOU Baffle Temperature Thresholds values.	5
H_SVT_LOU_MANG Start/Stop LOU Baffle management function		The objective of this test is to verify the ASW command Start/Stop LOU Balfe management function used for switching on/off the function.	2
H_SVT_LOU_LOU1 Enable LOU Baffle		The objective of this test is to Enable Lou Baffle Control.	20

control			
H_SVT_LOU_LOU0 Disable LOU Baffle control		The objective of this test is to Disable Lou Baffle Control.	15
H_SVT_LOU_REPO LOU Baffle Status Report		The objective of this test is to acquire the status and information of the ASW function "LOU Baffle management"	6
H_SVT_LOU _HNR Lou Baffle heater reconfiguration from nominal to redundant		The objective of this test is to switch from the nominal LOU Baffle Heater (Lou Dec Heater 1/2) to the redundant (Lou Dec Heater 3).	20
H_SVT_LOU _HRN Lou Baffle heater reconfiguration from redundant to nominal		The objective of this test is to switch from the redundant (Lou Dec Heater 3) to the nominal LOU Baffle Heater (Lou Dec Heater 1/2).	20

Total execution time estimated for LOU Baffle decontamination testing: 1.5 hours

5.8 Instruments

5.8.1 HIFI

The conduct of Block 3 of the HIFI tests (Commissioning Operations) is to be confirmed, depending on a the estimate of the test duration of the individual HIFI procedures which is not yet available.

Procedure Reference	Sequence Name	Description	Approx. Duration [min]
TEST 1 - Nominal Mode Transitions (COP context)			
H_FCP_HIF_NION		HIFI_SwitchedOff_to_Intermediate_Prime	00:05:00
H_FCP_HIF_COBS		HIFI_OBS_SFT	00:05:00
H_COP_HIF_NSON		HIFI_Intermediate_to_StandbyI_CP_Prime	00:15:00
H_COP_HIF_NHC1		HIFI_Chopper_openloop_set_health_check_Prime	00:05:00
H_COP_HIF_NHC2		HIFI_Chopper_openloop_scan_health_check	00:30:00
H_FCP_HIF_NUT0		HIFI_upload_LCU_table_flight_Prime_1-to-450	00:05:00
H_FCP_HIF_NUT1		HIFI_upload_LCU_table_flight_Prime_451-to-900	00:05:00
H_FCP_HIF_NUT2		HIFI_upload_LCU_table_flight_Prime_901-to-1350	00:05:00
H_FCP_HIF_NUT3		HIFI_upload_LCU_table_flight_Prime_1351-to-1800	00:05:00
H_FCP_HIF_NUT4		HIFI_upload_LCU_table_flight_Prime_1801-to-2250	00:05:00
H_FCP_HIF_NUT5		HIFI_upload_LCU_table_flight_Prime_2251-to-2700	00:05:00
H_FCP_HIF_NUT6		HIFI_upload_LCU_table_flight_Prime_2701-to-3150	00:05:00
H_FCP_HIF_NUT7		HIFI_upload_LCU_table_flight_Prime_3151-to-3600	00:05:00

H_FCP_HIF_NUT8		HIFI_upload_LCU_table_flight_Prime_3601-to-4050	00:05:00
H_FCP_HIF_NUT9		HIFI_upload_LCU_table_flight_Prime_4051-to-4500	00:05:00
H_FCP_HIF_NUTA		HIFI_upload_LCU_table_flight_Prime_4501-to-4950	00:05:00
H_FCP_HIF_NUTB		HIFI_upload_LCU_table_flight_Prime_4951-to-5400	00:05:00
H_FCP_HIF_NUTC		HIFI_upload_LCU_table_flight_Prime_5401-to-5850	00:05:00
H_FCP_HIF_NUTD		HIFI_upload_LCU_table_flight_Prime_5851-to-6300	00:05:00
H_FCP_HIF_NUTE		HIFI_upload_LCU_table_flight_Prime_6301-to-6750	00:05:00
H_FCP_HIF_NUTF		HIFI_upload_LCU_table_flight_Prime_6751-to-7200	00:05:00
H_FCP_HIF_NUTG		HIFI_upload_LCU_table_flight_Prime_7201-to-7650	00:05:00
H_FCP_HIF_NUTH		HIFI_upload_LCU_table_flight_Prime_7651-to-7905	00:05:00
H_FCP_HIF_CUPM		HIFI_upload_LCU_patches_flight_Prime	00:05:00
H_FCP_HIF_CRTM		HIFI_readback_LCU_table_flight_Prime	00:15:00
H_COP_HIF_C121		HIFI_StandbyI_to_StandbyII_Laser1_CP_Prime	00:05:00
H_FCP_HIF_C21P		HIFI_StandbyII_Laser1_to_Primary_CP_Prime	00:05:00
H_COP_HIF_CP21		HIFI_Primary_to_StandbyII_Laser1_CP_Prime	00:05:00
H_COP_HIF_C211		HIFI_StandbyII_Laser1_to_StandbyI_CP_Prime	00:05:00
H_COP_HIF_C122		HIFI_StandbyI_to_StandbyII_Laser2_CP_Prime	00:05:00
H_FCP_HIF_C22P		HIFI_StandbyII_Laser2_to_Primary_CP_Prime	00:05:00
H_COP_HIF_CP22		HIFI_Primary_to_StandbyII_Laser2_CP_Prime	00:05:00
H_COP_HIF_C221		HIFI_StandbyII_Laser2_to_StandbyI_CP_Prime	00:05:00
H_FCP_HIF_NSOF		HIFI_StandbyI_to_SwitchedOff_Routine_Prime	00:05:00
			03 :35
TEST 2 - Redundant Mode Transitions (COP context)			
H_FCP_HIF_RION		HIFI_SwitchedOff_to_Intermediate_Redundant	00:05:00
H_FCP_HIF_COBS		HIFI_OBS_SFT	00:05:00
H_COP_HIF_RSON		HIFI_Intermediate_to_StandbyI_CP_Redundant	00:15:00
H_COP_HIF_RHC1		HIFI_Chopper_openloop_set_health_check_Redundant	00:05:00
H_COP_HIF_RHC2		HIFI_Chopper_openloop_scan_health_check	00:30:00
H_FCP_HIF_RUT0		HIFI_upload_LCU_table_flight_Redundant_1-to-450	00:05:00
H_FCP_HIF_RUT1		HIFI_upload_LCU_table_flight_Redundant_451-to-900	00:05:00
H_FCP_HIF_RUT2		HIFI_upload_LCU_table_flight_Redundant_901-to-1350	00:05:00
H_FCP_HIF_RUT3		HIFI_upload_LCU_table_flight_Redundant_1351-to-1800	00:05:00
H_FCP_HIF_RUT4		HIFI_upload_LCU_table_flight_Redundant_1801-to-2250	00:05:00
H_FCP_HIF_RUT5		HIFI_upload_LCU_table_flight_Redundant_2251-to-2700	00:05:00
H_FCP_HIF_RUT6		HIFI_upload_LCU_table_flight_Redundant_2701-to-3150	00:05:00
H_FCP_HIF_RUT7		HIFI_upload_LCU_table_flight_Redundant_3151-to-3600	00:05:00
H_FCP_HIF_RUT8		HIFI_upload_LCU_table_flight_Redundant_3601-to-4050	00:05:00
H_FCP_HIF_RUT9		HIFI_upload_LCU_table_flight_Redundant_4051-to-4500	00:05:00
H_FCP_HIF_RUTA		HIFI_upload_LCU_table_flight_Redundant_4501-to-4950	00:05:00
H_FCP_HIF_RUTB		HIFI_upload_LCU_table_flight_Redundant_4951-to-5400	00:05:00
H_FCP_HIF_RUTC		HIFI_upload_LCU_table_flight_Redundant_5401-to-5850	00:05:00
H_FCP_HIF_RUTD		HIFI_upload_LCU_table_flight_Redundant_5851-to-6300	00:05:00
H_FCP_HIF_RUTE		HIFI_upload_LCU_table_flight_Redundant_6301-to-6750	00:05:00
H_FCP_HIF_RUTF		HIFI_upload_LCU_table_flight_Redundant_6751-to-7200	00:05:00
H_FCP_HIF_RUTG		HIFI_upload_LCU_table_flight_Redundant_7201-to-7650	00:05:00
H_FCP_HIF_RUTH		HIFI_upload_LCU_table_flight_Redundant_7651-to-7905	00:05:00

H_FCP_HIF_CUPM		HIFI_upload_LCU_patches_flight_Redundant	00:05:00
H_FCP_HIF_CRTM		HIFI_readback_LCU_table_flight_Redundant	00:15:00
H_COP_HIF_C121		HIFI_StandbyI_to_StandbyII_Laser1_CP_Prime	00:05:00
H_FCP_HIF_C21P		HIFI_StandbyII_Laser1_to_Primary_CP_Prime	00:05:00
H_COP_HIF_CP21		HIFI_Primary_to_StandbyII_Laser1_CP_Prime	00:05:00
H_COP_HIF_C211		HIFI_StandbyII_Laser1_to_StandbyI_CP_Prime	00:05:00
H_COP_HIF_C122		HIFI_StandbyI_to_StandbyII_Laser2_CP_Prime	00:05:00
H_FCP_HIF_C22P		HIFI_StandbyII_Laser2_to_Primary_CP_Prime	00:05:00
H_COP_HIF_CP22		HIFI_Primary_to_StandbyII_Laser2_CP_Prime	00:05:00
H_COP_HIF_C221		HIFI_StandbyII_Laser2_to_StandbyI_CP_Prime	00:05:00
H_FCP_HIF_NSOF		HIFI_StandbyI_to_SwitchedOff_Routine_Prime	00:05:00
			03 :35
TEST 3 - Nominal Memory management procedures			
H_SVT_HIF_NLBM			00:20:00
H_SVT_HIF_CLOM			00:20:00
H_FCP_HIF_NSOF		HIFI_StandbyI_to_SwitchedOff_CP_Prime	00:05:00
H_SVT_HIF_NLBM			00:20:00
			01:05
TEST 3 - Nominal Memory management procedures			
H_SVT_HIF_NLBM			00:20:00
H_SVT_HIF_CLOM			00:20:00
H_FCP_HIF_CPOM			00:20:00
H_FCP_HIF_NSOF		HIFI_StandbyI_to_SwitchedOff_CP_Prime	00:10:00
			01:10
TEST 4 - Redundant Memory management procedures			
H_SVT_HIF_RLBM			00:20:00
H_SVT_HIF_CLOM			00:20:00
H_FCP_HIF_CPOM			00:20:00
H_FCP_HIF_RSOF		HIFI_StandbyI_to_SwitchedOff_CP_Prime	00:10:00
			01:10
TEST 5 - Nominal COP-ROP-COP contexts			
H_FCP_HIF_NION		HIFI_SwitchedOff_to_Intermediate_Prime	00:05:00
H_COP_HIF_NSON		HIFI_Intermediate_to_StandbyI_CP_Prime	00:15:00
H_COP_HIF_NCRS		HIFI_StandbyI_CP_to_StandbyI_Routine_Prime	00:05:00
H_FCP_HIF_NHC3		HIFI_Chopper_closedloop_parameter_Prime	00:10:00
H_FCP_HIF_CRCS		HIFI_StandbyI_Routine_to_StandbyI_CP_Prime	00:05:00
H_FCP_HIF_NSOF		HIFI_StandbyI_to_SwitchedOff_Routine_Prime	00:05:00
			00:45
TEST 6 - Redundant COP-ROP-COP contexts			

H_FCP_HIF_RION		HIFI_SwitchedOff_to_Intermediate_Redundant	00:05:00
H_COP_HIF_RSON		HIFI_Intermediate_to_StandbyI_CP_Redundant	00:15:00
H_COP_HIF_RCRS		HIFI_StandbyI_CP_to_StandbyI_Routine_Redundant	00:05:00
H_FCP_HIF_RHC3		HIFI_Chopper_closedloop_parameter_Redundant	00:10:00
H_FCP_HIF_CRCS		HIFI_StandbyI_Routine_to_StandbyI_CP_Redundant	00:05:00
H_FCP_HIF_RSOF		HIFI_StandbyI_to_SwitchedOff_Routine_Redundant	00:05:00
			00:45
TEST 7 - Peakup simulation for ACMS test			
H_FCP_HIF_NION		HIFI_SwitchedOff_to_Intermediate_Prime	00:05:00
H_FCP_HIF_CSPK		HIFI_Simulate_Peakup	00:05:00
H_FCP_HIF_NSOF		HIFI_StandbyI_to_SwitchedOff_Routine_Prime	00:05:00
			000:30

Total execution time estimated for HIFI testing: TBD hours

5.8.2 PACS

Procedure Reference	Sequence Name	Description	Approx. Duration [min]
TEST 1 - Nominal Switch ON and Memory Management			
H_FCP_PAC_NSON		PACS Switch ON nominal	00:10:00
H_FCP_PAC_CSBN		Nominal Mode to Burst Mode	00:05:00
H_FCP_PAC_CSBF		Burst Mode to Nominal Mode	00:05:00
		Memory management - DPU	
H_FCP_PAC_CCDM		* Memory check of nominal/redundant DPU	00:20:00
H_FCP_PAC_NSOF		PACS switch OFF nominal	00:05:00
H_SVT_PAC_NLDM		* Memory load for a new nominal DPU OBSW	00:20:00
H_FCP_PAC_NLDM		* Memory load for a new nominal DPU OBSW	00:20:00
		Memory management - SPU	
H_FCP_PAC_NCSM		* Memory check of nominal SPU	00:20:00
H_SVT_PAC_NLSM		* Memory load for a new nominal SPU OBSW	00:20:00
H_FCP_PAC_NLSM		* Memory load for a new nominal SPU OBSW	00:20:00
		Memory management - DMC	
H_FCP_PAC_NCMM		* Memory check of nominal DMC	00:20:00
H_SVT_PAC_NLMM		* Memory load for a new nominal DMC OBSW	00:20:00
H_FCP_PAC_NLMM		* Memory load for a new nominal DMC OBSW	00:20:00
		Memory management – DPU via rescue mode	
H_SVT_PAC_NRDM		* Memory load for a new nominal DPU OBSW via rescue mode	00:20:00
H_FCP_PAC_NRDM		* Memory load for a new redundant DPU OBSW via rescue mode	00:20:00
H_FCP_PAC_NSOF		PACS switch OFF nominal	00:05:00
			04:10
TEST 2 - Nominal SAFE Mode Transition			
H_FCP_PAC_NSON		PACS Switch ON nominal	00:10:00
H_FCP_PAC_CSSF		Safe Mode Transition	00:05:00
H_FCP_PAC_NSIF		Immediate OFF Nominal	00:05:00
			00:20
TEST 3 - Redundant Switch ON and Memory Management			
H_FCP_PAC_RSON		PACS Switch ON redundant	00:10:00
		Memory management - DPU	
H_FCP_PAC_CCDM		* Memory check of nominal/redundant DPU	00:20:00
H_FCP_PAC_RSOF		PACS Switch OFF redundant	00:05:00
H_SVT_PAC_RLDM		* Memory load for a new redundant DPU OBSW	00:20:00
H_FCP_PAC_RLDM		* Memory load for a new redundant DPU OBSW	00:20:00
		Memory management - SPU	
H_FCP_PAC_RCSM		* Memory check of redundant SPU	00:20:00
H_SVT_PAC_RLSM		* Memory load for a new redundant SPU OBSW	00:20:00
H_FCP_PAC_RLSM		* Memory load for a new redundant SPU OBSW	00:20:00
		Memory management - DMC	
H_FCP_PAC_RCMM		* Memory check of redundant DMC	00:20:00
H_SVT_PAC_RLMM		* Memory load for a new redundant DMC OBSW	00:20:00
H_FCP_PAC_RLMM		* Memory load for a new redundant DMC OBSW	00:20:00
		Memory management – DPU via rescue mode	

H_SVT_PAC_RRDM		* Memory load for a new redundant DPU OBSW via rescue mode	00:20:00
H_FCP_PAC_RRDM		* Memory load for a new redundant DPU OBSW via rescue mode	00:20:00
H_FCP_PAC_RSOF		PACS Switch OFF redundant	00:05:00
			04:00
TEST 4 - Redundant SAFE Mode Transition			
H_FCP_PAC_RSON		PACS Switch ON redundant	00:10:00
H_FCP_PAC_CSSF		Safe Mode Transition	00:05:00
H_CRP_PAC_RSIF		Immediate OFF Redundant	00:05:00
			00:20

Total execution time estimated for PACS testing: 8 hours 50 minutes

5.8.3 SPIRE

SPIRE tests for H-SVT-1 will consist of nominal procedures only; the Contingency Recovery Procedures and Redundant Unit Procedures were not available at the time of the Test Plan compilation.

Procedure Reference	Delivered Procedure Name	Description	Approx. Duration [min]
TEST 1 - Nominal Mode Transitions			
		check to latest delivery	
H_FCP_SPI_NSON	DPU_START	Switch ON DPU (primary partition)	00:10:00
H_FCP_SPI_NDRN	DRCU_START		00:10:00
H_FCP_SPI_SCUN	SCU_ON		00:05:00
H_FCP_SPI_MCUN	MCU_BOOT	Enter REDY mode	00:10:00
H_FCP_SPI_BSMN	BSM_ON		00:05:00
H_FCP_SPI_BSMI	BSM_INIT		00:10:00
H_FCP_SPI_PHON	PDET_ON	Enter Photometer Standby Mode	00:10:00
H_FCP_SPI_PHOF	PDET_OFF		00:06:00
H_FCP_SPI_BSMF	BSM_OFF	Enter REDY mode	00:10:00
H_FCP_SPI_BSMN	BSM_ON		00:10:00
H_FCP_SPI_BSMI	BSM_INIT		00:10:00
H_FCP_SPI_SMCN	SMEC_ON		00:10:00
H_FCP_SPI_SDEN	SDET_ON	Enter Spectrometer Standby Mode	00:10:00
H_FCP_SPI_SDEF	SDET_OFF		00:10:00
H_FCP_SPI_SMCF	SMEC_OFF		00:10:00
H_FCP_SPI_BSMF	BSM_OFF	Enter REDY mode	00:10:00
H_FCP_SPI_MCUF	MCU_OFF	Switch OFF	00:04:00
H_FCP_SPI_SCUF	SCU_OFF		00:04:00
H_FCP_SPI_NDRF	DRCU_OFF		00:10:00
H_FCP_SPI_NSOF	DPU_OFF	Switch OFF	00:03:00
			02:47:00
TEST 2 - Nominal Memory Mangement			
H_FCP_SPI_NLBM	LOAD_OBS_BSW	Load OBS from BSW	00:20:00
H_SVT_SPI_CLOM	LOAD_OBS_ASW_01	Load OBS from ASW	00:20:00
H_FCP_SPI_CPOM	LOAD_OBS_ASW_02	Patch OBS from ASW	00:20:00
H_FCP_SPI_NSOF	DPU_OFF	Switch OFF	00:03:00

			01:03
TEST 3 - Redundant Mode Transitions			
H_FCP_SPI_RSON	DPU_START	Switch ON DPU (primary partition)	00:10:00
H_FCP_SPI_RDRN	DRCU_START		00:10:00
H_FCP_SPI_SCUN	SCU_ON		00:05:00
H_FCP_SPI_MCUN	MCU_BOOT	Enter REDY mode	00:10:00
H_FCP_SPI_BSMN	BSM_ON		00:10:00
H_FCP_SPI_BSMI	BSM_INIT		00:05:00
H_FCP_SPI_PHON	PDET_ON	Enter Photometer Standby Mode	00:10:00
H_FCP_SPI_PHOF	PDET_OFF		00:06:00
H_FCP_SPI_BSMF	BSM_OFF	Enter REDY mode	00:10:00
H_FCP_SPI_BSMN	BSM_ON		00:10:00
H_FCP_SPI_BSMI	BSM_INIT		00:10:00
H_FCP_SPI_SMCN	SMEC_ON		00:10:00
H_FCP_SPI_SDEN	SDET_ON	Enter Spectrometer Standby Mode	00:10:00
H_FCP_SPI_SDEF	SDET_OFF		00:10:00
H_FCP_SPI_SMCF	SMEC_OFF		00:10:00
H_FCP_SPI_BSMF	BSM_OFF	Enter REDY mode	00:10:00
H_FCP_SPI_MCUF	MCU_OFF		00:04:00
H_FCP_SPI_SCUF	SCU_OFF		00:04:00
H_FCP_SPI_RDRF	DRCU_OFF		00:10:00
H_FCP_SPI_RSOF	DPU_OFF	Switch OFF	00:03:00
			02:47
TEST 4 - Redundant Memory Mangement			
H_FCP_SPI_RLBM	LOAD_OBS_BSW	Load OBS from BSW	00:20:00
H_SVT_SPI_CLOM	LOAD_OBS_ASW_01	Load OBS from ASW	00:20:00
H_FCP_SPI_CPOM	LOAD_OBS_ASW_02	Patch OBS from ASW	00:20:00
H_FCP_SPI_RSOF	DPU_OFF	Switch OFF	00:03:00
			01:03

Total execution time estimated for SPIRE testing: 7 hours 40 minutes

5.9 Platform Instruments

5.9.1 SREM Testing

Procedure Reference	Sequence Name	Description	Approx. Duration [min]
H_FCP_RM_ON	HFM0010	**Herschel SREM Switch ON**	**3**
		Herschel SREM Accumulation	
		Start Accumulation	**3**
		Wait until at least 1 cycle is completed	**10**
H_FCP_RM_ACC	HFM0030	Stop Accumulation	**1**
DHS Procedure?!		**Dump Packet Store 1 for SREM Packets**	**2**
H_FCP_RM_REG	HFM0040	**Herschel SREM Set/Get Registers**	**5**
H_SVT_RM_MEM	HVM0050	**Herschel SREM Patch/Dump Memory**	**5**

H_FCP_RM_OFF	HFM0020	**Herschel SREM Switch OFF**	**2**

Total execution time estimated for SREM testing: 31 minutes

5.9.2 VMC Testing

Procedure Reference	Sequence Name	Description	Approx. Duration [min]
		Herschel VMC Operation	
		Separation required to switch VMC on	
		Start image transfer to CDMU (takes 53 minutes)	**2**
		Wait for transfer to be completed	**60**
H_LEO_VMC_OP	HLV0010	Wait for 150 kbps TM rate	
DHS Procedure?!		**Dump Packet Store 1 for VMC Packets**	**2**

Total execution time estimated for VMC testing: 1 hour 4 min

5.9.3 CCU Testing

The procedure list does not provide the order of test execution. The CCU Testing Timeline master procedure will include the calls to the individual test procedures in a logical order.

The list of ccu procedures comprises, in comparison to the tests conducted during the H-SVT-0, (i) a set of new procedures, (ii) a set of procedures already run in SVT-0 but need to be re-run (due to NCR or procedure update) and (iii) procedures already run successfully listed again for regressing tests. The later are potential candidates for de-scoping should time not allow running the complete list of procedures.

Procedure Reference	Sequence Name	Description	Approx. Duration [min]
H_SVT_CCU_TL HSVT1 CCU Testing Timeline		The objective of this procedure is to provide the SVT1 Timeline for the CCU Testing.	30
H_SVT_CCU_CHECK CCU Start-up Configuration Verification		The objective of this test is the verification of the CCU A and B HK at its start-up condition.	30
H_SVT_CCU_AB01 CCU Switch ON		The objective of this procedure is to power ON of CCU A and/or B ON.	30 (to be executed twice)
H_SVT_CCU_AB00 CCU Switch OFF		The objective of this procedure is to power OFF of CCU A and/or B.	30 (to be executed twice)
H_SVT_CCU_SYNC CCU Time Synchronisation		The objective of this test is a Time Synchronisation coherency check between MCS, CTR and CCU.	15
H_SVT_CCU_MON CCU Monitoring Mode Verification		The objective of this test is the verification of the CCU A and B in Monitoring Mode via Payload Management.	100
H_SVT_CCU_MONP CCU Monitoring Mode acquisition period		The objective is to manage the CCU Monitoring period & parameters and the acquisition period for CCU packets in case of : - Routine use: Enable CCU A/B MONITORING of all parameters with a monitoring Period of 512 sec. - Recycling: Enable CCU A/B MONITORING of parameters: DW#2 set to Ox0C49, DW#3 set to Ox0201 and DW#4 to DW#6 set to Ox0000 with a monitoring Period of 8 sec. - Decontamination: Enable CCU A/B monitoring of parameters: DW#2,3,4 and 6 set to 0x0000 and DW#5 set to 47FF	40 (to be execute 3 times)

		- Disable all CCU monitoring packets.	
H_SVT_CCU_VBN0 Big Nozzle open		The objective of this test is to open of cryostat big nozzle valves (V504/V505). Note: Every single valve operation needs confirmation from ASED Cryo Engineer.	20
H_SVT_CCU_VBN1 Big Nozzle close		The objective of this test is to closure of cryostat big nozzle valves (V504/V505). Note: Every single valve operation needs confirmation from ASED Cryo Engineer.	20
H_SVT_CCU_MANG Start/stop Payload management function		The objective of this test is to verify the ASW command Start/Stop Payload Management used for switching on/off the function.	3 (to be executed twice)
H_SVT_CCU_CCUR CCU Anomaly		On CCU A or CCU B anomaly, switch OFF of failed CCU	40 (to be executed twice)
H_SVT_CCU_REPO Payload management status Report		The objective of this test is to acquire the status and information of the ASW function "Payload Management".	6

Total execution time estimated for CCU testing: 6.5.hours

6 SCHEDULE

6.1 Test Schedule

T0	SVT start
SVT Plan available	T0 – 3 months
Consistent Dataset available	T0 – 3 months
SVT procedures available	T0 – 6 weeks
SVT procedures approved	T0 – 4 weeks (approval by TAS/EADS/Project)
NDIU installed at Test Site	N/A – NDIUs are installed and tested
Comms lines available	N/A – COMMs installed and tested
SVT Readiness Review	T0 – 2 week
LIT (connectivity test)	T0 – 3 working days
LIT confirmation (short final connectivity test)	T0 – 1 working day
SVT Closeout Review	T0 + 4 weeks

6.2 Herschel SVT-1 Test Execution Schedule

The Herschel SVT-1 is scheduled for the period of 10 working days:

DAY 1:	Tuesday	11th March 2008
DAY 2:	Wednesday	12th March 2008
DAY 3:	Thursday	13th March 2008
DAY 4:	Friday	14th March 2008
DAY 5:	Saturday	15th March 2008
DAY 6:	Monday	17th March 2008
DAY 7:	Tuesday	18th March 2008
DAY 8:	Wednesday	19th March 2008
DAY 9:	Thursday	20th March 2008
DAY10:	Deferred[2]	

[2] DAY 10 of the Herschel SVT-1 Test Plan comprising the System Level Tests has been deffered to later date.

6.2.1 Test Day 1

Day 1	MSTACK 1		
System	CDMU		
Procedure	Title	Duration	Comment
CDMU Block 5		07:45	Note: start of OBCP shall be interleaved
P_SVT_DHS_1503	Daily dump SSMM stores	02:00	Note: the daily dump of the SSMM store (i) can be started in parallel with the final 2 hours of testing for each day; (ii) is not mandatory, but shall be executed at least once

Day 1	MSTACK 2		
System	CCU		
Procedure	Title	Duration	Comment
CCU		07:30	

Day 1	MSTACK 3		
System	SREM		
Procedure	Title	Duration	Comment
SREM		00:30	

6.2.2 Test Day 2

Day 2 System	MSTACK 1 CDMU		
Procedure	Title	Duration	Comment
CDMU Block 4		07:40	
P_SVT_DHS_1503	Daily dump SSMM stores	02:00	Note: the daily dump of the SSMM store (i) can be started in parallel with the final 2 hours of testing for each day; (ii) is not mandatory, but shall be executed at least once

Day 2 System	MSTACK 2 OBSM to CDMU and ACC (CDMU Block 6)		
Procedure	Title	Duration	Comment
OBSM-01	Execute ESOC Test OBCP and associated OBCP management activities	01:20	Descoped due to related NCRs
OBSM-02	Systematic CDMU CROME register dumps	00:20	
OBSM-03	Systematic ACC CROME register dumps	00:20	
OBSM-04	ACC AGSA register dumps	00:15	
OBSM-05	Enable/Disable write to CPU and COCOS registers or EEPROM	00:10	
OBSM-06	Enable/Disable write to ASW/BSW code and constants	00:10	
OBSM-07	Memory load, dump, check and copy activities	02:00	
OBSM-08	CDMU software upload and restart with the new OBSW	00:30	
OBSM-09	ACC software upload and restart with the new OBSW	00:30	
	Total duration:	04:15	

6.2.3 Test Day 3

Day 3	MSTACK 1		
System	PACS		
Procedure	Title	Duration	Comment
PACS			Priority
TEST 1 - Nominal Switch ON and Memory Management		04:10:00	1
TEST 2 - Nominal SAFE Mode Transition		00:20:00	2
TEST 3 - Redundant Switch ON and Memory Management		04:00:00	3
TEST 4 - Redundant SAFE Mode Transition		00:20:00	3
	Total duration:	08:50:00	
P_SVT_DHS_1503	Daily dump SSMM stores	02:00	Note: the daily dump of the SSMM store (i) can be started in parallel with the final 2 hours of testing for each day; (ii) is not mandatory, but shall be executed at least once

Day 3	MSTACK 2		
System	Thermal		
Procedure	Title	Duration	Comment
TCS Block 2		04:45	
Mirror Decontamination Testing		01:30	
LOU Baffle Decontamination Testing		02:00	
	Total Duration:	08:25	

6.2.4 Test Day 4

Day 4	MSTACK 1		
System	SPIRE		
Procedure	Title	Duration	Comment
SPIRE			
TEST 1 - Nominal Mode Transitions		02:47:00	1
TEST 2 - Nominal Memory Mangement		01:03:00	2
TEST 3 - Redundant Mode Transitions		02:47:00	2
TEST 4 - Redundant Memory Mangement		01:03:00	3
	Total duration:	7:40:00	
P_SVT_DHS_1503	Daily dump SSMM stores	02:00	Note: the daily dump of the SSMM store (i) can be started in parallel with the final 2 hours of testing for each day; (ii) is not mandatory, but shall be executed at least once

Day 4	MSTACK 2		
System	Thermal, EPS		
Procedure	Title	Duration	Comment
EPS		06:00	
TCS Block 1		02:00	
	Total Duration:	08:00	

6.2.5 Test Day 5

Day 5 System	MSTACK 1 TT&C (via RF)		
Procedure	Title	Duration	Comment
TT&C Block 1		08:00	
H_SVT_TTC_COM1		01:00	If time allows
	Total Duration:	08:00 (+01:00)	
P_SVT_DHS_1503	Daily dump SSMM stores	02:00	Note: the daily dump of the SSMM store (i) can be started in parallel with the final 2 hours of testing for each day; (ii) is not mandatory, but shall be executed at least once

6.2.6 Test Day 6

Day 6	MSTACK 1		
System	TT&C (via umbilical)		
Procedure	Title	Duration	Comment
TT&C Block 2		07:00	
P_SVT_DHS_1503	Daily dump SSMM stores	02:00	Note: the daily dump of the SSMM store (i) can be started in parallel with the final 2 hours of testing for each day; (ii) is not mandatory, but shall be executed at least once

Day 6	MSTACK 2		
System	HIFI		
Procedure	Title	Duration	Comment
			Priority
TEST 1 - Nominal Mode Transitions (COP context)		02:36:00	1
TEST 2 - Redundant Mode Transitions (COP context)		02:36:00	3
TEST 3 - Nominal Memory management procedures		01:10:00	2
TEST 3 - Redundant Memory management procedures		01:10:00	3
TEST 3 - Nominal COP-ROP-COP contexts		00:45:00	2
TEST 4 - Redundant COP-ROP-COP contexts		00:45:00	3
	Total Duration:	9:02:00	

6.2.7 Test Day 7

Day 7 System	MSTACK 1 ACMS		
Procedure	Title	Duration	Comment
ACMS Block 1		06:30	

Day 7 System	MSTACK 2 CDMU		
Procedure	Title	Duration	Comment
CDMU Block 1		06:15	
P_SVT_DHS_1503	Daily dump SSMM stores	02:00	Note: the daily dump of the SSMM store (i) can be started in parallel with the final 2 hours of testing for each day; (ii) is not mandatory, but shall be executed at least once

6.2.8 Test Day 8

Day 8 System	MSTACK 1 ACMS		
Procedure	Title	Duration	Comment
ACMS Block 2		08:10	

Day 8 System	MSTACK 2 CDMU		
Procedure	Title	Duration	Comment
CDMU Block 2		06:00	
P_SVT_DHS_1503	Daily dump SSMM stores	02:00	Note: the daily dump of the SSMM store (i) can be started in parallel with the final 2 hours of testing for each day; (ii) is not mandatory, but shall be executed at least once

Day 8 System	MSTACK 3 HIFI Peak-up		
Procedure	Title	Duration	Comment
TEST 7 - Peakup simulation for ACMS test		00:30	To be interleaved with ACMS Peak-up tests on MSTACK 1

6.2.9 Test Day 9

Day 9	MSTACK 1		
System	ACMS		
Procedure	Title	Duration	Comment
ACMS Block 3		04:50	
ACMS Block 4		02:00	
	Total Duration:	06:50	

Day 9	MSTACK 2		
System	CDMU		
Procedure	Title	Duration	Comment
CDMU Block 3		08:00	
P_SVT_DHS_1503	Daily dump SSMM stores	02:00	Note: the daily dump of the SSMM store (i) can be started in parallel with the final 2 hours of testing for each day; (ii) is not mandatory, but shall be executed at least once

6.2.10 Test Day 10

NOTE: TEST DAY 10 is deferred to a later date, due to open NCRs which prevent the procedures to be run as foreseen.

Day 10 System	MSTACK 1 & MSTACK 2 SYSTEM Tests mode transition) incl VMC and SYSTEM CRPs		
Procedure	Title	Duration	Comment
Nominal Mode Transition Test	Transition from Launch to Sun Acquisition Mode to Nominal Mode (LEOP Sequence)	TBD	Incl. VMC testing
H_SVT_SYS_DODR	Recovery from SM (HSIA 8.2.2 SOHO case or DoD) back to science ops on redundant units	TBD	
	Total Duration:	TBD	

7 APPENDICES

Additional appendices shall be included as required.

7.1 TBC/TBD List

Ref.	Page/Section	Subsystem	Description	Action	Status	Comment
GEN-01	/1.3	Documentation	Check availability of updated version of PS-ICD	TAS-F	Closed	TAS-F (BC): PS-ICD is at issue 6
GEN-02	/2.7	Responsibilities	Key persons to be nominated	PROJECT, TAS-F, TAS-I ASTRIUM	Open	Update of test plan done during TRR 13.Feb. Open point: instrument representatives at ESTEC. Closure of TBD upon closure of AI on HIPT to organize SVT support with instrument teams.
GEN-03	/2.8	INTERCOM	Loop name for AIT site	MOC	Closed	
GEN-04	/3.3	Test configuration	Provide version number of HPSDB Central Site	TAS-F	Closed	TAS-F (BC): V.3.3.1.27
OBCP-01	/2.1	Test objectives	Decide on scope of test objectives vis-à-vis OBCP handling	MOC with TAS-F	Open	TAS-F(FN): OBCP delivered with last SDB. Under testing on the AVM . The use is pending the successful test during the IST and the confirmation of the NCRs closure. TRR: OBCP tests started on 11 Feb, facing problems.
TTC-01	/3.3	Test configuration	Check availability of RF link for dedicated TT&C tests	TAS-F	Closed	TAS-F(FN): Yes, available. Co-axes cables from TTC SCOE and either wave guide transition interfaces or Antenna Caps
OBCP-02	/3.3.1	Test configuration	OBCP status at the beginning of each test day (loaded and enabled?) to be defined	TAS-F	Open	TAS-F(FN): Loaded and enable by default except for Launch, loaded and disable. TRR: OBCP status still unknown.

GEN-05	/3.3.1	Test configuration	Special configuration items for specific test days for DAY1 to DAY10 to be indentified and defined	TAS-F/ MOC	Closed	Closed with issue 1.1 of the test plan
GEN-06	/3.3.1	Test configuration	S/C default configuration prior to hand-over to MOC is TBD.	TAS-F/ MOC	Closed	Closed with issue 1.1 of the test plan
GEN-07	/3.3.1	Test configuration	Special configuration items for the specific test days.	TAS-F/ MOC	Closed	Closed with issue 1.1 of the test plan
GEN-08	/3.3.1	Test configuration	Confirm S/C configuration (in terms of real units in use vs. simulated units in use)	TAS-F	Closed	TAS-F(FN): attachment 7.5 added to the test plan
GEN-09	/3.3.3	Test configuration	For the set-up of the EGSE and SCOE for each SVT-1 test day the default power-up sequences and AIT procedures will be used	TAS-F/ ASTRIUM	Closed	TAS-F(FN) confirms; MOC understanding is that default sequences will be used as baseline, modified according to the specific needs per each test day
GEN-10	/4.2	Constraints	Constraints due to known S/C or SCOE anomalies.	TAS-F/ ASTRIUM	Open	TAS-F(FN): to be identified during the TRR TRR:
GEN-11	/4.4	Constraints	List of restricted or dangerous commands *Note: No restricted/dangerous commands have been identified for H-SVT-0 [see Fax HP-ALS-06-0111; also reconfirmed during H-SVT-0 preparation telecon of 21st July 2006; MoM MS0607018-1), but this needs to be investigated and re-confirmed for H-SVT-1*	TAS-F/ ASTRIUM/ HIFI PACS/ SPIRE	Open	TAS-F(BC): HIFI LOU ? HIFI WBS laser operation to log. SPIRE Launch lock & SMEC commands forbidden. PACS Launch lock not to open with warm FPU TAS-F(FN): Concerning TAS-F equipment responsibility, No dangerous TC is identified if ground plug properly set-up (NCA/Thr). Dangerous cmd identified at instruments level : to assess by instrument **MOC position:** Chapter 4.4 updated according to current knowledge and constraints were indeed identified. TAS-F to comment on MOC

						position. AI (telecon 09/01/08) ASED shall provide the dangerous commands concerning the Cryo part. ASED shall read the CCU FCP (OFF switch) to verify if the monitoring on CCU stayed ON is enough to assure the safe monitoring.
IF-01	/2.2	Interfaces	Confirm propagation delay data to MCS for linux (FD interface).	MOC/ FD	Open	TRR: i/f works ok; delay to be specify.
GEN-12	/6.2	Schedule	H-SVT-1 date	PROJECT/ TAS/ MOC	Closed	TRR: at TRR start of H-SVT-1 is 10th March
HIFI-01		Test objectives	Peak-up should be tested during SVT-1; to be discussed with FD and HIFI (can be pure ACMS exercise [direct command from ground] or may involve HIFI as discussed during SciOps Meeting #2 (MoM HERSCHEL/HSC/MOM/1002)	MOC/ HIFI	Open	MS: foreseen for ACMS test day 8; to be verified with HIFI that instrument is switched on during that test day
HIFI-02		Test objectives	TPF ICD for HIFI – shall the TPF be tested during SVT-1	MOC/ HIFI/ HSC	Closed – confirmed to be part of the test	
HIFI-03		Test Configuration	Determine initial test set-up for HIFI tests	PROJECT/ EADS/TAS	Closed	TAS-F(BC): OFF ? (baseline) or Obs (as for RMS) TAS-F(FN): OFF state
PACS-01		Test Configuration	Determine initial test set-up for PACS tests	PROJECT/ EADS/TAS	Closed	TAS-F(BC): OFF ? (baseline) or Obs (as for RMS) TAS-F(FN): OFF state
SPIRE-01		Test Configuration	Determine initial test set-up for SPIRE tests	PROJECT/ EADS/TAS	Closed	TAS-F(BC): OFF ? (baseline) or Obs (as for RMS) TAS-F(FN): OFF state

INSTR-01		Safe Test Configuration	Review Test Plan (list of procedures) against required system configuration. Identify constraints; ensure that planned tests or sequence of tests doesn't endanger the instruments or the cryogenic system.	PROJECT/ INSTRUMENTS/EADS/MOC	Open	TRR: shall be closed when TRR AI (provide "acceptance matrix") will be closed by cw 8
TCS-01		Thermal (TCS)	Status of the TCS hardware (heaters and thermistors) installation for H_SVT_1 needs to be clarified.	TAS-I	Open	TAS-I: SVM TCS Hardware is all installed on Herschel, according to H-P-TN-AI- 0069 Issue10 and H-P-TN-AI-0104 Issue 5. All E2E tests have been completed. MOC(EP): OPEN 23-01-08 (OPS Meeting) For Herschel not all control loops are installed yet. AI-5 TAS-F to provide at H-SVT1 TRR the status of the Herschel control loop. For Planck all control loop, except spares, are active
TCS-02		Thermal (TCS)	The mechanism to force a thermistor failure is TBD. This failure occurs when one of the three thermistors used in a control loop is inconsistent with the other two. Possibly by changing the thermistor temperature warming it, and verify the relevant housekeeping parameter updating.	TAS-I	Closed	TAS-I: to be discussed MOC(EP): OPEN 23-01-08 (OPS Meeting) force a thermistor failure descoped TRR: it was decided during the Ops meeting to descope the test.
TCS-03		Thermal (telescope decontamination)	Status of the telescope decontamination heaters and thermistors installation for H_SVT_1 needs to be clarified. In case the heaters are installed note that the procedure H_SVT_DEC_DEC1 (Start Decontamination) foreseen to start the decontamination process. Therefore the decontamination parameters will be adjusted by a TC(8,4,113,1) to prevent any risk of stress on the heaters and the telescope (i.e. heaters stay off). The decontamination thresholds that shall be commanded to lead to never actuate the	ASTRIUM	Open?	TAS-F(FN): The telescope is planned to be integrated during end of February (two weeks after the SVT1) the decontamination shall be activated. If activated, a very low temperature will be acquired (open circuit) and HCS will be switched ON. We can check the HCS ON event if no current . Heater lines in open circuit. The FCP from TAS-F on the decontamination includes the thresholds

			decontamination heaters are TBD.			MOC(EP): Ok flight decontamination thresholds will be used. 23-01-08 (OPS Meeting) Status of the hardware installation unknown - Related FDIR TBC. eg. if the thermistor is not installed a reconfiguration can be triggered? TAS-F have sent all FCP concerning the DEC for expertise purpose to ASED TRR: baseline is no telescope for the SVT; procedures need to be adapted (no temperature increase, but switch can be monitored)
TCS-04		Decontamination (telescope decontamination)	Modify Decontamination Heating TC(8,4,113,1) parameters: Tmin/max1 and Tmin /max2 calibration curve is unknown.	TAS-F	Open	MOC(EP,MS): OPEN Please clarify the meaning of SDB PB MS080108 telecon:: EP: what does "SDB PB" mean? FN: it's a database problem. NCR in progress EP Correction expected by database delivery end JAN TRR: database was postponed, now expected by cw 7.
TCS-05		Decontamination (Lou baffle decontamination)	Modify Decontamination Heating TC(8,4,118,3) parameters Low and high Thresholds calibration curve is unknown.		Open	MOC(EP,MS): OPEN Please clarify the meaning of SDB PB MS080108 telecon:: EP: what does "SDB PB" mean? FN: it's a database problem. NCR in progress EP Correction expected by database delivery end JAN TRR: database was

						postponed, now expected by cw 7
TCS-06		Thermal (Lou baffle decontamination)	Status of the LOU baffle decontamination heaters and thermistors installation for H_SVT_1 needs to be clarified. In case the heaters are installed note that the procedure H_SVT_LOU_LOU1 (Enable LOU Baffle control) foreseen to start the LOU baffle decontamination process. The decontamination parameters will be adjusted by a TC(8,4,118,3) to prevent any risk of stress on the heaters and the LOU baffle (i.e. heaters stay off) The decontamination thresholds that shall be commanded to lead to never actuate the decontamination heaters are TBD.		Open	TAS-F(FN): The LOU baffle is planned for integration 1month after the SVT1 (TBC) The FCP from TAS-F on the decontamination includes the thresholds. MOC(EP): OK Flight decontamination thresholds will be used. 23-01-08 (OPS Meeting) Status of the hardware installation at SVT time execution TBC - Related FDIR TBC eg. if the thermistor is not installed a reconfiguration can be triggered? TAS-F have sent all FCP concerning the DEC for expertise purpose to ASED TRR: as per TCS-03
TCS-07		Thermal (Lou baffle decontamination)	In case of Lou Baffle Thermistor Failure the event TM(5,4,118,3) is issued (which suggests that a ground intervention is required) is possible to remove the failed thermistor from the Lou Baffle control? If yes, how?		Closed	TAS-F(BC): CRP done and delivered MOC(EP): OPEN The procedure H_CRP_LOU_BAF_DECONT does not cover Baffle Thermistor Failure event CRP will be updated and delivered TRR: test descoped.

POW-01		Power	LCL commandability test feasibility (interaction between 1553 and HL commands) needs to be confirmed.	TAS-I	Closed	TAS-I open action OPLCL 45 ON/ OFF via HL and 1553 Additionally feasibility to perform H_SVT_EPS_LCL2 (LCL Switching via HPC and HLC) commands OP LCL 45,46,47, 43 ON/OFF via HL is TBC TRR: agreement to act only on the redundant LCLs.
POW-02		Power	Please clarify the LPS/SAS sections available. Currently is assumed that all the sections (30 sections) are available	TAS-I	Closed	Telecon 08-01-08: TAS-I wait for the final confirmation TRR: TAS-I confirms that all sections are available.
POW-03		Power	Please confirm that is feasible to execute the NCA activation test i.e. there is no safety issue as the cryostat door will remain closed.		Closed	TAS-F(FN): Verify safety plug before start the procedure or use electrical set-up used during IST for similar test (TC verification by oscilloscope on dummy load) MOC(EP): ok
CCU-01		CCU	DLCM measurement constrains needs to be identified eg. During flight is forseen that all instrument FPUs need to be switched OFF to ensure constant dissipation and precise temperature measurement. Is this constrain applicable to HSVT1?		Closed	TAS-F(BC): To be clarify? where do the information come? In baseline,DLCM is performed in HeII with instruments ON TAS-F(FN): The SUM 3.0 is erroneous. The instruments shall be stayed in ST/BY mode.(Not OFF) MOC(EP: ok)
CCU-02		CCU	Cryostat status at start of the test needs to be clarified. As part of the S/C preparation activities before the handover to ESOC, the CCUs shall be turned ON and initialised so cryostat HK data and monitored parameters can be checked.		Closed	TAS-F(FN): CCU health check and CCU monitoring delivered Ask ASED for the status at the beginning of the test. MOC(EP) Open, waiting ASED response Cf MOM telecom 9/01/08

						Action concerning the CCU the flight values already delivered are not applicable for the SVT1 helium 1 ASED shall give a snapshoot with coherency TM in helium I as reference for the H-SVT1 (end of January) TRR: input received from TAS-F.
CCU-03		CCU	Status of the Sun Shield/EPLM Thermal Sensors installation for H_SVT_1 needs to be clarified.		Closed	TAS-F(BC): Which Sensors ? flight or additional ? Question To be clarify ? TAS-F(FN): Sun Shield /EPLM planned to be integrated in parallel of the Helium II production and during the SVT1. MOC(EP): ok
CCU-04		CCU	Monitoring mode for Recycling configuration clarification: Please confirm the selected cryo control monitoring parameters to be acquired every 8 seconds during recycling: According to the CCU management procedure for cryo recycling has to be sent TC(8,4,111,1) with the following parameters: - Unit : 0x00FF for both CCU - Monitoring Period :0x0008 - Data word#2 set to Ox0C49 (or Ox0C59) - Data word#3 set to Ox0201 (- Data word#4 to word#6 set to Ox0000 The expected behaviour of selected parameters during the recycling phase needs to be clarified.		Closed	TAS-F(FN): Referred to the FCP “CCU acquisition period” (delivered) MOC(EP) ok
CCU-05		CCU	Monitoring mode for Decontamination configuration clarification: Please confirm the selected cryo control monitoring parameters to be acquired every 8 seconds during Decontamination:		Closed	TAS-F(FN): Referred to the FCP “CCU acquisition period” (delivered) MOC(EP): ok

			Data word#2 to word#6 set to OxFFFF (for default value) or to select the decontamination thermistors . That is corresponding to bits Gg, Gh, Gi, Gj, Gk, Gl, Gm, Gn, Go, Gp, Gq, Gu of word#5 of word#5?			
CCU-06		CCU	Big nozzle valves (V504/V505) open/closure clarification: 1) Constrains and/or required industry intervention at S/C site (if any) related to Big nozzle operations needs to be identified. 2) Final TM verifications after cryo-valves big nozzle valves (V504/V505) open/closure are TBD.		Closed	TAS-F(FN): 1)No constraints, Valves cmd by TC. 2) Valves status MOC(EP): OK. Regarding point 2 large nozzle OPEN/CLOSE decrease/increase the HTT temperature . The question is which are the exacted temperature values? ASED shall verify what is done in the CCU / Valves procedures before to say if the procedure is dangerous or not TRR: agreed to run it as "green light" confirmation TC by TC.
CCU-07		CCU	Re-enforcement of valves V501/503 and valves V103/106 opening clarifications: 1) There is a delay of 17 minutes between the opening of valves V501/503 and valves V103/106 when those valves are open by Ariane, TBD if such constraint exists during re-enforcement of the valves opening by ground. 2) Final TM verifications are TBD.		Closed	TAS-F(FN): 1)20 min see Herschel DCI. No constraint 2) Valves status MOC(EP): OK. Regarding point 2 See note about Big nozzle valves. ASED shall verify what is done in the CCU / Valves procedures before to say if the procedure is dangerous or not TRR: agreed to run it as "green light" confirmation TC by TC.
TTC-01		TTC	Please clarify which are the TTC units (XPNDs and TWTs equipment) to be used during	TAS-I	Closed	TAS-F(FN): TAS-F position : No restriction TBC by TAS-I

			HSVT1. Link to the following database items: Twt1_UnitSelect (RN001439) Xpd1_UnitSelect (RN001442) Twt2_UnitSelect (RN002439) Xpd2_UnitSelect (RN002442)			TAS-I: See Herschel FM TCDL_0008 Issue 15. MOC(EP): OPEN The question is which will be the flight unit to be installed TRR: list of equipment used during SVT was provided
TTC-02		TTC	Please confirm the following TTC operation recommendation (Ref. Planck IST Specification issue 4): When changing the TM rate, the TM encoder setting shall be changed before the XPND one, so that the clock frequency sent by the encoder is already coherent with the new setting, when this one is commanded to the XPND.	TAS-I	Open	MS: still open; OPS meeting AI on TAS-F to clarify 23-1-08 (OPS meeting) TAS-F to clarify (AI-13) mainly if this warning is applicable not only to IST& but all other tests and operations TRR: still open. Needs urgently to be addressed by TAS-F
TTC-03		TTC	EPC HELIX CURRENT MOT entries clarification. Shall be enabled both Monitong ID 76 HelixCur_OutHi) and 77 (HelixCur_OutLo) when TWTA 1 is powered ON?		Closed	TAS-F(FN): TAS-F : If TC service 115 is used, it is managed autonomous by SW MOC(EP): ok
TTC-04		TTC	The site test setup (ground equipment configuration) to be used during TTC testing via the RF-Link and its operational constrains needs to be clarified. The ground equipment related operations to carry out the proposed TTC test needs to be identified and specified. So far I can identify: a) carrier acquisition procedure b) TM/TC bit rate change procedure c) Antenna change procedure d) TTC commissioning related activities procedure (H_SVT_TTC_COM) requires i) Decreasing the uplink RF level		Closed	TAS-F(FN): Feasible but should be commanded from CCS Some IST FCP may be used (FCP based on PLOP rules) MOC(EP): OK FYI the TTC commissioning related activities (H_SVT_TTC_COM1TTC) will be descoped from the HSVT1 plan NCR 3474

			in suitable steps to detect the acquisition and demodulation thresholds for both TC bit rates is reached. ii) Verify the characteristics of TX1 RF output signal (frequency, power levels, spurious outputs): unmodulated and modulated by telemetry signals. The feasible to perform this test is TBD			
ACMS-01		ACMS	Confirm the need for Coarse-to-Fine in SAM (TC_SET_RCS_CONTROL_MODE) and Abort OCM (TC_ABORT_CURRENT_DELTAV)) as Special SVT-1 procedures	MOC	Closed	TRR: updated in test plan issue 1.1
ACMS-02		ACMS	Provision of SIM DB for AOCS SCOE (thruster misalignment, etc)	EADS	open	TRR: to be checked
GEN-13	/2.8	EGSE set-up	telephone and fax numbers for ESTEC AIT check-out area are to be provided	PROJECT	closed	
INSTR-02	/3.3	CDMU OBCPs for Instrument FDIR	In case ESOC prefers to load the CDMU OBCPs for instrument FDIR prior to instrument tests on day 3 and day 4, we need confirmation that the OBCP definitions available in the HPSDB delivered prior to SVT-1 are the applicable ones	TAS-F	Closed	TRR: part of S/C config (as per chapter 3.3)
SYS-01		System CRP on Day 10	Detail the Power SCOE configuration (SA Sim, Real Battery?, triggering of battery DoD through a dedicated script)	TAS-F	open	
SYS-02	/3.3.1		TCT tables to be loaded for SVT-1 (i.e. under He I conditions)? The following shall be clarified: *"Herschel IST Test Spec seems to ask for "an ambient temperature TCT" to be loaded before starting the tests but no further input is provided. TAS-F to confirm. "*	TAS-F	open	

POW-04	/3.3.1		Solar Arrays Simulator supplying 1700 W (TBC by TAS whether this is appropriate for instrument operations on day 3 an day 4 as well),	TAS-F/I / ASTRIUM	Closed	See TAS-F response.

Proforma Log Sheet

The table below provides an example of the execution log that will be maintained in real-time during SVTs.

SVT TEST LOG TEST ID:				Stack:	
TEST CASE ID		DESCRIPTION			
TEST DATE		TEST CONDUCTOR			
TEST OBJECTIVES					

LOCAL TIME hh:mm:ss	TEST EXECUTION NOTES	AR	ACTIONS

7.2 Outline Procedures

See separate Attachment 7.3 of the SVT1 Test Plan for the SVT procedures:

Initial Checks Procedures
System Procedures
CDMU Procedures
ACMS Procedures
TT&C Procedures
Power Procedures
Thermal Procedures
HIFI Procedures
PACS Procedures
SPIRE Procedures
SREM Procedures
CCU Procedures
VMC Procedures

7.3 Cross Reference Table: Industry Procedure Names <-> MOC Procedure Names

7.4 Units in Use During Herschel SVT-1

Sub-system	Unit/Equipment	
CDMS		
	Processor Module	Flight
	Reconf. Module	Flight
	TM Encoder	Flight
	TC Decoder	Flight
	CPDU	Flight
	SSMM	Flight
	SGM	Flight
	1553 Bus Controller A	Flight
	1553 Bus Controller B	Flight
	Serial Bus Controller Board (SBCH)	Flight
ACMS		
	Processor Module	Flight
	Reconf. Module	Flight
	CPDU	Flight
	SGM	Flight
	Serial Bus Controller Board (SBCH)	Flight
	1553 Bus Controller A (towards ACMS equipment)	Flight
	1554 Bus Controller B (towards ACMS equipment)	Flight
	1553 Remote Terminal A (from System)	Flight
	1553 Remote Terminal B (from System)	Flight
	RWL (Herschel only)	Flight
	STR	Simulated by ACMS SCOE
	CRS (Herschel)	Simulated by ACMS SCOE
	CRS (Planck)	Planck !
	AAD	Simulated by ACMS SCOE
	SAS	Simulated by ACMS SCOE
	Gyro (Herschel)	Simulated by ACMS SCOE
RCS		
	Latch Valve	Flight

	Thruster 20N	Disconnected, effect simulated by ACMS SCOE
	Thruster 1N	Disconnected, effect simulated by ACMS SCOE
	Tank	Flight
TT&C		
	TWTA	Flight
	EPC	Flight
	Receiver (Rx)	Flight
	Transmitter (Tx)	Flight
	1553 Remote Terminal (XPND1)	Flight
	1553 Remote Terminal (XPND2)	Flight
	RFDN	Flight
	LGA1	Stimulated by TTC SCOE, through antenna cap
	LGA2	Stimulated by TTC SCOE, through antenna cap
	LGA3 (Planck only)	Planck
	MGA	Stimulated by TTC SCOE, through antenna cap
PCS		
	PCDU	Flight
	Battery	Power is taken from power SCOE in SAS configuration
	Solar Array	Disconnected, power is taken from power SCOE in SAS configuration
TCS		
	HPS	
	CCU	Flight
	Internal valve	Flight
	External valves	Flight
	Cryostat Cover	Flight
HIFI		
	FPU	Flight
	FCU	Flight
	IFH	Flight
	IFV	Flight
	LOU	Flight
	LSU	Flight
	FHLCU	Flight
	FHHRH	Flight
	FHHRV	Flight
	FHWEH	Flight
	FHWEV	Flight
	WOH	Flight
	WOV	Flight
	FHICU	Flight
PACS		
	FPBOLC	Flight
	FPDECMEC	Flight
	FPDPU	Flight
	FPSPU	Flight

SPIRE

HSDPU	Flight
HSFCU	Flight

7.5 SSMM Packet Store Definition for Herschel SVT-1

See separate Excel File