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HERSCHEL

HSC-ICC

Interactions Document

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Document Status Sheet

DOCUMENT TITLE	HERSCHEL HSC-ICCs Interactions Document
DMS DOCUMENT ID:	

VERSION	REVISION	DATE	OVERALL REASON FOR CHANGE
Draft 1	0C	2nd July 08	Updates made as per DCR No. 2 to reach 1.0
1	0	6th August 08	Updates made as per DCR No. 3 to reach 1.1
1	1	27th February 08	Updates made as per DCR No. 4 to reach 1.2

DCR No 1

Document Change Record

DCR NO	1
DATE	2nd July 08
ORIGINATOR	LO'Rourke

1. DOCUMENT TITLE: HERSCHEL HSC-ICC Interactions Document

2 DOCUMENT REFERENCE:

3. DOCUMENT ISSUE/REVISION NUMBER: Draft 1.0C

4. PAGE	5. PARAGRAPH	6. REASON FOR CHANGE
All	All	Initial Draft

DCR No 2

Document Change Record

DCR NO	2
DATE	6th August 08
ORIGINATOR	LO'Rourke

1. DOCUMENT TITLE: HERSCHEL HSC-ICC Interactions Document

2 DOCUMENT REFERENCE:

3. DOCUMENT ISSUE/REVISION NUMBER: Issue 1.0

4. Section/Subsection	5. REASON FOR CHANGE (blue is difference between 5th & 6th August release)
3.2	Changed generator of QC report to be QC pipeline & transfer mechanism to be Kayako software (tables 1 & 2 updated).
3.3 & 3.4	Changed "Quality Control Pipeline interactions" to be 'Data Quality Control Analysis interactions'.
4.2	Added Archive Scientist to participant list of Core CCB
5.2	Inputs from E.Verdugo to update this section : - First paragraph should be: Quality Control Analysis is managed... - Second paragraph, last sentence: Update - This is something to be decided by the HSC calibration scientist at level2 - Last paragraph. It is clear now that ICCs are only contacted by the HSC calibration scientists as a second line of defence for QC at level2
6.1.1	Minor textual update clarifying use of ICC helpdesks + removed a paragraph referring to a possible interface between the ICCs and the community (which is not in fact the case).
7.1.3 & 7.2.3	Correction from V.Ossenkopf on text on how they check their delivery
7.2	Moved to section 7.3 to allow Commissioning section to come before PV section. Changed title name such that Mission Planning is now MPS
7.3	Moved to Section 7.4
New 7.2	Created a new 7.2 to address the delivery of the commissioning phase inputs to the HSC from the ICCs
9.3.2	Inclusion of a paragraph describing how the ICCs shall be kept informed of new data being received at HSC & being placed in the FTP server.
9.4	Added 9.4.1 to refer to bulk product transfer ICD

DCR No 3

Document Change Record

DCR NO	3
DATE	27th February 09
ORIGINATOR	LO'Rourke

1. DOCUMENT TITLE: HERSCHEL HSC-ICC Interactions Document

2 DOCUMENT REFERENCE:

3. DOCUMENT ISSUE/REVISION NUMBER: Issue 1.1

4. Section/Subsection	5. REASON FOR CHANGE
3.2	Updated table to reflect that SIAM & SSO files are generated at the MOC
5	Renamed the title from "Pipeline Interactions" to be "Pipeline & Calibration Product Interactions"
5.1	Renamed the title to be "The impact on the SPG at HSC of such changes"
5.1.2 & 5.1.3	Renumbered. It is now 5.2 & 5.3
(The new) 5.2	- Updates of the section to reflect inputs from A.Abreu and inputs from an interactions telecon on the 24th Oct 08. - Updated this section to include conclusions from DP SAG meeting on delivery of downlink Calibration products to the HSC
NEW Chapter 6	Moved original sections 5.2.x to be in a new chapter 6 with the title "Data Quality Control Analysis Interactions"
Chapters 7, 8, 9	Moved now to be chapters 8, 9 & 10
Original 7.1.3 & 7.2.3 (now 8.1.3 7 8.2.3)	Correction from V.Ossenkopf on text on how they check their delivery
Original 7.1 & 7.2 (now 8.1 & 8.2)	- Renamed extension of SSF files from .xml to .ssf (to close out SPR 5540. - Updated these sections to redefine the naming conventions to be used both within the tar file & the actual tar file itself - Updated the Readme file such that point 10 reflects type of information which will help the MPS operators at HSC e.g. impacts of a replan on the previous OD
Original 7.3 (now 8.3)	Removed text defining delivery mechanism & contents. These details are contained in the previous subsection (8.2)
Original 8.1.2 (now 9.1.2)	Introduced the ICC operational Email Addresses

Original 8.2 (now 9.2)	Updated the OBSM Image delivery procedure. Files are delivered as .IMG on the FTP ops server. Readmes & pdfs shall be delivered in the email sent to the HSC.
New 9.3	Updated contents to address delivery of HPSDB to the ICCs & typical delivery note.
New 9.4	A new section has been added to address SIAM updates & deliveries
Original 9.2.3 (now 10.2.3)	Moved 10.2.3 to be 10.2.4 to allow a new section to be added
New 10.2.3	Added a new section 10.2.3 which covers “Ensuring consistency of propagated data between the centres”
Original 9.4 (now 10.4)	Full update to this section to include additional subsections relating to retrieval of data from the HSA & knowing what is in the archive.
10.2.3	Updated to address new HSC gap filter software to check for missing data & ensure consistency between DBs at HSC & the ICCs.

DCR No 4

Document Change Record

DCR NO	4
DATE	21st April 09
ORIGINATOR	LO'Rourke

1. DOCUMENT TITLE: HERSCHEL HSC-ICC Interactions Document

2 DOCUMENT REFERENCE:

3. DOCUMENT ISSUE/REVISION NUMBER: Issue 1.2

4. Section/Subsection	5. REASON FOR CHANGE
3.4	List of Email addresses updated Interactions with the ICCs & use of email addresses clarified Interactions with the ICCs on DB related issues & use of the email addresses clarified
5.2	Referred to the wiki page which contains the most up to date agreed procedure between the HSC & ICCs on this topic
8.2.2	Updated the date convention in the delivered tar file name such that it is in YYYY year format rather than YY format
8.5	New section – Parallel Mode interactions
8.6	New section – Manual Commanding interactions
8.7	New Section – CUS Script Naming conventions
10.2.2	Updated to cover the propagation completion emails being sent to the ICCs, the propagation completion flag & DDS Completion flag files that are placed on the FTP ops server
10.2.3	Updated to refer to the Gap report file and where it is placed on the FTP Ops server
10.2.4	Propagation Email addresses clarified
10.3.2	Detailed update to refer to files being delivered from MOC including filenames to expect in the emails. Email addresses to be used for these file deliveries specified here. Updated also to refer to locations of gap checker, prop_status & dds flag files on the FTP Ops server

DCR No 5

Document Change Record

DCR NO	5
DATE	14th September 09
ORIGINATOR	LO'Rourke

1. DOCUMENT TITLE: HERSCHEL HSC-ICC Interactions Document

2 DOCUMENT REFERENCE:

3. DOCUMENT ISSUE/REVISION NUMBER: Issue 1.3

4. Section/Subsection	5. REASON FOR CHANGE
All	Replaced reference to Operations CCB by Core CCB
All	Replaced email address for Spire Ops centre
2.1	Updated the applicable documents section to point to the newly created Ground Segment ICD Twiki page.
4.2	Updated text to state that ICC are members of the Core CCB
4.3.2	- Added the ICC representative names to the Core CCB table - Updated the text to reflect the lower level CCBs being also capable of bringing issues to the Core CCBs attention - Removed typo
4.4.1	Defined timescale of Core CCBs being held in the PV phase
5.2	Removed most of its contents and referred to the wiki page which has the most up to date procedure
6.3	Clarified that the HSC ICS representatives review the Level 2 tickets before some of these tickets are identified to need feedback from the ICC and are passed on to the ICCs
8.1	Removed the contents of this section which was very much specific to pre-launch CUS backend deliveries to the HSC to support AO Calls. This approach is not relevant any more as the astronomer backend is now being delivered on a gradual basis by the ICCs as they release their AOTs.
8.2.2	- Updated the MC tar file naming convention to be consistent with the approach agreed between HSC & ICCs some months ago. - Replaced the word "delivery note" by "Readme file" - Updated email list to state that as of issue 1.3, there is no need to copy project on delivery emails
New section 8.2.4	New Email Template to be used by the ICCs when making uplink deliveries

8.2.5 (original 8.2.4)	Update of the testing approach to reflect that the Core CCB is not involved in uplink delivery approval & rollout.
New section 8.3.4	New Email Template to be used by the ICCs when making uplink deliveries
8.3.5 (original 8.3.4)	Update of the testing approach to reflect that the Core CCB is not involved in uplink delivery approval & rollout.
New 8.4	New section defining the Astronomer AOT delivery approach. This section is placed here rather than at the beginning to reflect the overall chain of mission phases i.e. COP, PV, End PV i.e. Astronomer AOT release.
New numbering of sections Original 8.4 = 8.5 Original 8.5 = 8.6 Original 8.6 = 8.7	Result of including a new 8.4
New 8.8	This describes the delivery approach for Sequencer & HSpot config table Updates from HIFI to the HSC
New numbering of sections Original 8.8 = 8.9	Result of including a new 8.8
9.1.3	Update of instrument anomaly section to state that low level instrument anomalies reported by MOC shall be raised in the JYRA SxR system by HSC on the Instrument in question rather than in the ARTS. This was agreed in a recent briefing with all ICC managers attending.
9.2.2	Update of the OBSM section to reflect the operational approach for rolling out a new OBSM image (based upon the HIFI OBSW upload performed in the COP phase).
9.3.2	Update of the MIB section to reflect that MIBs shall be sent directly to the MOC via email with delivery notes etc included. HSC shall be placed on copy.
9.4.3	Reference made to herfts02 as being the new prime herfts machine for data distribution.
10.1.2	Updated subsection name to reflect the “intended” lease line setup for operations
10.1.3	New subsection name to reflect the “actual” lease line implementations + graphs showing throughput.
10.3.4	New subsection describing how the ICCs are being informed on data completeness by the HSC.
10.4	Reference made to herfts02 as being the new prime herfts machine for data distribution.
10.4.3	New subsection describing how long term & short term horizon files shall be requested from the HSC & how they are used as well as how they are delivered.
10.5.5	New subsection describing how the ICCs are being informed on changes in the Aux product versioning.

DCR No 6

Document Change Record

DCR NO	6
DATE	15th December 09
ORIGINATOR	LO'Rourke

1. DOCUMENT TITLE: HERSCHEL HSC-ICC Interactions Document

2 DOCUMENT REFERENCE:

3. DOCUMENT ISSUE/REVISION NUMBER: Issue 1.4

4. Section/Subsection	5. REASON FOR CHANGE
8.4.4	Moved to section 8.4.5
New 8.4.4	New subsection which defines how to inform the HSC & Core CCB on the delivery of an ASTR MC
8.5.1	Updated to include recommendations from HSC
New 8.5.2	Delivery of Calibration Observations during the Routine phase : Input tar file for the HSC
New 8.5.3	Delivery of Calibration Observations during the Routine phase : Contents of the Readme file
New 8.5.4	Delivery of Calibration Observations during the Routine phase : Contents of the email to HSC to inform of a delivery
New 8.5.5	Delivery of Calibration Observations during the Routine phase : Feedback to the ICCs on the testing & implementation of the delivery
9.2.2	Updated the section to define that the Core CCB does not need to be held in order to approve the upload of a new OBSM image. This is a direct ICC-MOC interaction.
New 9.5	Created new subsection to record how Instrument HK can be processed by the ICCs where propagation is down
10.4.4	New sub-bullet relating
Appendix 1 & 2	Contents of the setup scripts to support what is in section 9.5

Table of Contents

Acronym List

For Acronyms used in this document, please refer to the following Wiki Address (with the standard Herschel Username/Password e.g. as used for livelink)

http://www.herschel.be/twiki/bin/view/Hcss/HerschelAcronyms

1. Introduction

1.1 Purpose

This document identifies & defines in detail the operational interactions that shall exist between the HSC and each of the Instrument Control Centres (ICCs), namely HIFI, PACS & SPIRE, after launch.

A first attempt to identify these interactions has been described in [RD 1].

1.2 Scope

This document describes in detail all operational interactions that exist between the HSC & the ICCs. While the ICDs that exist between the centres may define the data format & content that are exchanged, this document describes how this exchange happens at a procedural level.

Updates to ICDs will affect this document only if the exchange mechanism is affected or additional subsystems in use at the various centres are introduced into the interface.

This document is envisaged to be updated during operations through the endorsement of changes by the Core CCB which is made up of HSC & ICC representatives.

2. Related documents

2.1 Applicable documents

[AD.1] Herschel Ground Segment List of ICDs, FIRST/FSC/DOC/0150, Issue 2.0

[AD.2] Herschel science ground segment FTP interface control document, HERSCHEL-HSC-ICD-0968, See G/S ICD Wiki page for latest version.

[AD.3] Herschel science ground segment CVS interface control document, HERSCHEL-HSC-ICD-0967, See G/S ICD Wiki page for latest version.

[AD.4] HCSS documentation, DB Administration Procedures covering the Propagation mechanism (section 4), Herschel-HSC-DOC-0833, See G/S ICD Wiki page for latest version.

[AD.5] Herschel Bulk Product Transfer ICD - HERSCHEL-HSC-ICD-1083, See G/S ICD Wiki page for latest version.

All Ground Segment ICDs can now be found in the following Wiki page :

http://www.herschel.be/twiki/bin/view/HSC/GroundSegmentInterfaces

2.2 Reference documents

[RD.1] HSC-ICC Operational Interactions (Feedback Mechanism) TN, HSCDT-TN066, Draft 0.9

[RD.2] Herschel Science Ground Segment Integration & Test Plan (SGS I&T), Herschel-HSC-DOC-0589, 1.2,

[RD.3] Herschel Ground Segment Interface Requirements document, FIRST/HSC/DOC/0117, Issue 2.6

[RD.4] Herschel Product Definitions document, HERSCHEL-HSC-DOC-0959, Issue 0.5 draft

[RD.5] Herschel SGS Communications RRF Report, HERSCHEL-HSC-REP-695, Issue 1.0

3. Listing the Interactions between HSC and the three ICCs

3.1 The main HSC-ICC transfer & data exchange mechanisms

As an introduction to the HSC-ICC operational interactions and to support the procedures & steps that are outlined in the coming pages, here is a brief overview of the transfer mechanisms envisaged to support the exchange of different data types and information sets between the HSC and the ICCs throughout the course of the mission.

(a) **Propagation Mechanism:** Science & HK TM Object data are transferred from the HSC to the ICCs through the nominal ODBMS Propagation process. Additional data such as OOL and TCH data are also provided here.

(b) **Bulk Product transfer mechanism** – This mechanism is used to retrieve a product from the Herschel Science Archive (HSA) in an automatic and transparent way.

(c) **FTP Server** – this server is located at HSC and is accessible via the lease line only. It shall be used as the location where the HSC shall place files received by the HSC from the MOC and that are to be forwarded to the ICC e.g. Orbit file, PSF, OBSM image dump, Attitude History file, Time correlation file, and those that are received by the HSC from the ICC and transferred on to the MOC after evaluation e.g. OBSM image for uplink. The mechanism is also foreseen to transfer other files that the ICC would need to perform mission planning & Proposal Handling e.g. Horizons files, SIAM file, SSO Ephemerides file.

(d) **CVS Server:** Typical data & software exchanged via the CVS includes: CUS Script updates, Uplink Calibration Tables transfer, DP & HCSS Software deliveries.

(e) **HSA Interface** - Standard Herschel Science Archive for accessing products at HSC

Besides the above data interactions, there will of course be those interactions related to Helpdesk, Quality Control, instrument anomalies as well as the clear need to hold regular status meetings during the operations phase.

3.2 Overview of the HSC-ICC data types being exchanged

The following interfaces listed in the tables below have been identified between Herschel Science Centre and the three Instrument Control Centres. The contents of the tables below have been extracted from [AD 2] with definition of data type contents etc described in [AD 1, 2, 3, 4 & 5].

Files being transferred	File Description	Generation Details	Transfer Mechanism
S/C TM Pkts	Spacecraft HK TM Objects	ESOC DDS provided data	Propagation
HK TM Pkts	Instrument HK TM Objects	ESOC DDS provided data	Propagation
SCIENCE TM Pkts	Instrument Science TM Objects	ESOC DDS provided data	Propagation
Data Frames	Instrument Science TM Data Frames[1]	Generated at HSC	Propagation
OOL	Out of Limit data	HSC DDS ingested data (OOL)	Propagation
TCH	Telecommand History data	HSC DDS ingested data (TCH)	Propagation
TCO	Time Correlation packets	ESOC DDS provided data	Propagation
Products	SPG generated products	Generated at HSC	Product transfer
OBSM/IOBS	Instrument Image File from MOC	ESOC FTS provided data	FTP
Orbit file	Auxiliary Data File from MOC	ESOC FTS provided data	FTP
SIAM	Spacecraft Instrument Alignment	Generated at HSC	FTP
SSO Ephem	SSO Ephemerides file	Generated at HSC	FTP
PSF	Planning Skeleton file	ESOC FTS provided data	FTP
TSF	Timeline Summary file	ESOC FTS provided data	FTP
EPOS	Enhanced POS File	ESOC FTS provided data	FTP
HCSS S/W	HCSS Software releases	CSDT software	CVS
QCR	Quality Control Report	QC Pipeline	Kayako
AHF	Attitude History File	ESOC provided data	FTP
MPS & PHS Aux data	All data not mentioned above required to run MPS & PHS e.g. Horizons file	HSC provided data	FTP
HPSDB/MIB	Spacecraft DB / MIB files	ESOC provided data	FTP

Table 1 Data to be transferred from HSC to SPIRE/HIFI/PACS ICCs

[1] SPIRE & HIFI ICCs only

Files being transferred	File Description	Generation Details	Transfer Mechanism
MPSSF	ICC Mission Planning Schedule File	Generated using MPS at ICCs	CVS server
IOBS	OBSM Image File	ICC OBSM Export tool output	FTP Server
CAL – Uplink	Calibration object update	Calibration software	CVS Server
CAL Downlink	Calibration object update	Calibration software	CVS Server
CUS	CUS DB Script update	CUS Software	CVS Server
DP S/W	Data Processing Scripts & S/W	Generated at ICCs	CVS Server
CALOBS	Calibration Observations	Generated at ICCs	CVS Server
TPF	Task Parameter File	Generated at ICCs	FTP Server
MIB	Instrument DB updates	Generated at ICCs	FTP Server
QCR	Quality Control Reports	QC pipeline	Kayako

Table 2 Data to be transferred from SPIRE/HIFI/PACS ICCs to the HSC

3.3 Summary of the main interactions between the HSC & the ICCs

The HSC & the ICCs shall have the following main operational interactions :

Configuration Control Board Interactions

- Configuration Control board for the Commissioning, PV & Routine phase

Pipeline (SPG & Quality Control) Interactions

- DP Software (including pipeline updates) deliveries to the HSC
- Downlink Calibration table updates at the HSC
- Data Quality Control Analysis interactions

Community Support Interactions

- Helpdesk Interactions

Mission Planning & Proposal Handling Interactions (Uplink Cus/Cal file updates)

- Astronomer AOT cus/cal file updates at the HSC
- Mission Planning Interactions – during the PV phase
- Mission Planning Interactions – during the Routine phase

Instrument Specific Operational Interactions

- Instrument Anomalies & notification of problems
- OBSM Interactions
- HPSDB & MIB Interactions

Operational Data Transfers with the ICCs - Interactions

- Propagated data
- FTP server provided data
- Interfaces with the HSA & Product transfer

3.4 Operational Email Addresses to be used between the Centres

The HSC & the ICCs shall have the following main email addresses to be used during Operations.

Nominal ICC Operational Email Addresses

HIFI_ICC <hifi-operations@sron.nl>,

PACS_ICC <pacs_ops@sciops.esa.int>

SPIRE_ICC <Spire@stfc.ac.uk>

Configuration Control Board Interactions

General Email Address applicable for HSC & ICCs

- cCCB@sciops.esa.int

Pipeline (SPG & Quality Control) Interactions

DP Software (including pipeline updates) & Downlink Calibration table deliveries to the HSC shall be sent to the following email address at the HSC :

- herdp_ta@sciops.esa.int

For the case of Data Quality Control Analysis interactions, no email is required as the interface will be via the Kayako system

Helpdesk Interactions

For the case of normal Helpdesk interactions, no email is required as the interface will be via the Kayako system

Mission Planning & Proposal Handling Interactions (Uplink Cus/Cal file updates)

Interactions concerning Cus/Cal files & AOT updates & MPS deliveries to the HSC shall be sent to the following email address at the HSC :

- hscops@sciops.esa.int

Interactions by the HSC with the ICCs shall be sent from the HSC to the standard ICC operational email addresses where relevant. It should be noted that specific individuals at the ICCs may be put in copy of this email as defined in the delivered OD Readme file. The hscops email address shall ALWAYS be in copy.

Emails from the Mission Planning Group at the HSC shall originate from the following email address :

- hsccsg@sciops.esa.int

Responses from the ICCs to these MPS related emails should be made to the hsccsg email address but they MUST copy the hscops email address.

Other emails e.g. from the uplink co-ordinator at HSC, will originate from that individual and he/she will send the emails to the relevant ICC operational email. It should be noted that specific individuals at the ICCs may be put in copy of this email as defined in the delivered OD Readme file. Responses to these emails by the ICCs should be sent to the HSC individual in question but MUST copy the hscops account.

Instrument Specific Operational Interactions + Data Transfer Interactions

Interactions concerning Instrument Anomalies, OBSM updates, MIB/HPDSB issues and other data type transfers e.g. propagation, shall be sent to the following email address at the HSC :

- hscops@sciops.esa.int

Interactions of the above with the ICCs shall be sent to the standard ICC operational email addresses.

Interactions with the HSA should go to the following email address : sat_hsa@sciops.esa.int

Emails sent from the HSC to the ICCs relating to DB propagation issues shall be sent to the standard ICC Operational Email Addresses & the herdbops email address.

3.5 HSC-ICC Interactions – Meetings & Telecons during operations

It is clear that the HSC & the ICCs will need to hold regular meetings & telecons during the various phases of the mission.

These shall be detailed here in the next draft of this document.

4. The Operations Configuration Control Board

4.1 The Core CCB – An introduction

To be completed in the next draft of this document.

For the purpose of this draft, readers should be aware that the Core CCB does now exist. The ICC representatives are not yet required to participate however this is expected to change very soon. At present they are in copy of the minutes of the meeting.

4.2 Who participates in the Core CCB

The following individuals are participants in the Core CCB :

FUNCTION	ATTENDANCE
HSCOM/Chair	All meetings
System Engineer	All meetings
ICS Group Lead	All meetings
Comm Supp. Grp. Lead	All meetings
DP Group Lead/DP CCB	All meetings
S/W Maint. Group Lead	All meetings
Config. Control Eng.	All meetings
Q/Secretary	All meetings
SAT/HSA	Occasional
Computer Supp. Group	Occasional
Project Scientist	All meetings
Archive Scientist	All meetings
ICC Representatives	Occasional (depending on ICC topic on the agenda)

4.3 The CCB Configuration Item list and Notifiable Item list

4.3.1 The Core CCB Configuration Item List

The initial list of Configuration Items (CI's) (mostly applications) pertinent to the Core CCB can be downloaded from Livelink:
http://www.rssd.esa.int/llink/livelink?func=ll&objId=2823210&objAction=browse&sort=name&viewType=1

ID	CI Name	RE	NI Event Name
1	MPS	HCSS CCB	MPS SxR's
2	MIB	HCSS CCB	MIB SxR's
3	CUS	HCSS CCB	CUS SxR's
4	TCHOOL	HCSS CCB	TCHOOL SxR's
5	TM Ingest	HCSS CCB	TM Ingest SxR's
6	DDS	HCSS CCB	DDS SxR's
7	PHS	Comm Support	All SxR's raised are NI's to cCCB
8	HSPOT	Comm Support	All SxR's raised are NI's to cCCB
9	MPS	Comm Support	All SxR's raised are NI's to cCCB
10	Helpdesk	Comm Support	All SxR's raised are NI's to cCCB
11	User Registration	Comm Support	All SxR's raised are NI's to cCCB
12	IA Astronomer	Comm Support	All SxR's raised are NI's to cCCB
13	CUS/Cal scripts	ICC CCBs	script changes
14	HSA	HSA CCB	LM consult with EV
15	ROL	HSA CCB	LM consult with EV
16	FTS	HOTCore	FTS errors such as lease lines/MOC server down
17	All ICDs	Systems Eng Group	All ICD changes must be agreed by Ops CCB
18	ICC SPG	ICC CCBs	ICC SPG pipeline(code & calibration files)
19	ICC QCP	ICC CCBs	ICC QCP pipeline(code & QC criteria files)
20	SPG	DP CCB	SPG infrastructure
21	QCP	DP CCB	QCP infrastructure
22	IA Astronomer	ICC CCBs	ICC astronomers IA (code & calibration files)
23	IA Cal Scientist	ICC CCBs	ICC cal scientist IA (code & calibration files)
24	IA Astronomer	DP CCB	Astronomer's IA infrastructure
25	IA Cal Scientist	DP CCB	Cal scientist IA infrastructure
26	SPG	DP CCB	hscops changes
27	CalSDB	DP CCB	CalSDB code changes(dependent on HCSS packages)
28	CalSDB Models	Instrument Cal Support	Calibration source models changes
29	RefPlatform	Configuration Control	new libraries and existing library updates

4.3.2 The Core CCB Responsible Entities & Notifiable Item List

A Responsible Entity is any external CCB or HSC sub-group overseeing any sub-system or configuration item. Each RE is represented on the cCCB.

Responsible Entity (RE)	RE representative on the cCCB
HCSS Core CCB	Jon Brumfit
DP CCB	Stephan Ott
Science Archives CCB	Christophe Arviset/Pedro Osuna
ICC CCBs	PACS CCB – Bart Vandenbussche SPIRE CCB – TBD HIFI CCB – TBD
HSC Group	Group Leaders
SPIRE ICC representative*	T.Lim
HIFI ICC representative*	R.Shipmann
PACS ICC representative*	E.Wieprecht

*ICC representatives can vary depending on availability, topic to be discussed etc.

Groups of Configuration Items are controlled by Responsible Entities. E.g. DP is ontrolled by the DPCCB; HCSS by the Dev.CCB; CUS files by ICC CCBs, Community Support tools are monitored by the User Support Group and maintained by the S/W Maint. Group. Each of these Responsible Entities (REs) is represented on the cCCB by a Responsible Entity Representative (RER). (See minutes of cCCB#3.)

A **Notifiable Item** is any event under the control of a external CCB (DP, ICC, XSA, HCSS S/W maintenance) that leads to an SxR being raised during operations in the Core CCB system for the purpose of alerting the Core CCB that it must take some corresponding action e.g. ICC CCB authorises a change in a DP Calibration File. A member of the DP team must raise an SxR in the Core CCB system so that the Core CCB can manage the impact of this DP change through the overall system.

Note : At this present time, the Core CCB SxR system is the same as that in use by all CCBs for Herschel.

In general, external CCBs maintain configuration control of their own subsystems. Most SxR for those sub-systems are not seen by the cCCB.

In fact, it is clear that all DP SxRs are visible to the cCCB since they are raised in the same system as all other SxRs. The principle is intact however, in that the Notifiable Items identify those DP items that are of direct concern to the cCCB, wheras all other changes are, in principle, only the province of the DP CCB. The same principle applies for other lower level CCBs.

4.4 The CCB process during the PV & Routine Phases of the mission

4.4.1 Rapid CCB Interactions

It is understood that during the PV phase in particular, reactions to changes in the on-ground and on-board configurations will need to be performed in a controlled but rapid manner. This subsection shall detail how this shall be done at the level of the Operations Configuration Control Board level.

The need to hold an Core CCB during the PV phase will arise whereby a "notifiable item" and its corresponding SxR need to be dealt with on an urgent basis.

During the PV phase, the Core CCB would be expected to be held on a weekly basis, with the capability of further meetings/telecons being held whereby urgent changes are required which cannot wait until the next planned meeting.

The calling of such a meeting must be made by one of the Core CCB attendees.

All correspondence with the Core CCB shall be via the following email address : cCCB@sciops.esa.int

4.4.2 Routine CCB Interactions

The Core CCB will be held once monthly during routine operations (TBC) with the capability of further meetings/telecons being held whereby urgent changes are required which cannot wait until the next planned meeting.

5. Pipeline & Calibration Product Interactions

5.1 The impact on the SPG at HSC of such updates

The Standard Product Generation Pipelines at the HSC are made up of many different software & configuration file constituents whose primary source in most cases is the Instrument Control Centre.

The delivery of a new/updated downlink calibration product or a DP Software change is controlled through the Core CCB process. Go-ahead is given (based upon a number of criteria being met e.g. testing performed etc) by this CCB to replace the current SPG version with this new version from a certain date.

The nature of the update e.g. small S/W patch, defines the amount of testing that needs to be performed and indeed how this change impacts on already generated data.

After a period of time e.g. 1-2 years, the Project Scientist agrees to perform a bulk processing of all products already existing in the archive to bring them up to date with the latest known/available pipeline infrastructure & software.

5.2 Procedure for delivery of Downlink calibration products to HSC

Downlink calibration products are used during systematic data processing early stages by different tasks of the instrument's pipelines mainly to:

- Remove the instrumental effects from the measured astronomical signals.
- Decode the instrument telemetry packets (Science + HK) to extract relevant parameters within those tm packets.

The procedure for delivery of downlink calibration products to the HSC can be found on the following wiki page and is not repeated here :

http://www.herschel.be/twiki/bin/view/Hcss/DownlinkCalibrationProducts

Here is an example of the contents of that wiki page :

- Downlink Calibration Products Update Procedure
  - Change Record
  - Overview
  - Detailed Procedure
  - Example (with code)
- Naming Convention for delta pools
- SIMS#3 Downlink Calibration Delivery
- Related Meetings
- Status of interface
  - Operations Baseline Downlink Calibration Delivery
  - PACS Delta Downlink Calibration Deliveries
  - SPIRE Delta Downlink Calibration Deliveries
  - HIFI Delta Downlink Calibration Deliveries

5.3 Procedure for delivery of pipelines to HSC SPG

Update to the ICC Pipelines & generation of Delivery note

1. A decision is taken by the ICC DP software development team that the current pipeline software needs to be updated based upon e.g. improved pipeline algorithms, resolution of SPRs etc.

2. Once the update has been made and tested by the DP Software developer in question, the Calibration Scientist@ICC proceeds to test the updated software using data produced by the instrument and stored at the ICC. Such tests shall include performing a comparison of the products generated with those stored in the archive to confirm that the software change is as expected. Note should be taken of the expected differences where a reprocessing at HSC is required.

3. If these tests are successful then the updated software is made available to the other Calibration Scientists@ICC & ICC Sub-nodes (TBC).

4. The ICC CCB is then called whereby the updated pipeline software (linked to a build number) is agreed to be made available to the HSC SPG. Note that several SxRs can be combined when informing the CCB of a change. Once the ICC CCB confirms that the delivery may proceed then the ICC shall (always) produce a release/delivery note containing the following information :

========== Delivery Note Proposed Format ==========

The proposed format for the delivery note is:

1. MAIN SECTION:
   * Summary of update (reason for pipeline update)
   * Pipelines affected by update.
   * Test harnesses used in s/w verification.
   * Test cases run at the ICC
   * Calibration update related : YES/NO. If YES, then refer to the SxR corresponding to the update.
   * Dependencies of pipeline with other s/w modules. (for each module here, there should be an entry in the details section if applicable)
2. DETAILS SECTION:
   * MODULE PIPELINE: (old/new version)
     1. Reason for change in module.
     2. SXRs fixed.
   * MODULE N.: (If applicable from MAIN) (old/new version)
     1. Reason for change in module.
     2. SXRs fixed.
   * MODULE CAL: (If applicable from MAIN) (old/new version)
     1. Reason for change in module.
     2. SXRs fixed.

========== End of Delivery Note Proposed Format ==========

5. This delivery note shall be sent to the following email addresses : herdp_ta@sciops.esa.int & cccb@sciops.esa.int

Delivery Mechanism of the updated pipeline software

Note: At present pipeline 'software updates' currently require a new dp-X build being created. This may be applicable to only the pipeline modules in the future. At that point, the delivery mechanism of updated pipelines shall be re-addressed and this document updated (if required).

Activities at the HSC

6. The DP pipeline operator at the HSC shall download the software and shall then perform various tests (including those test procedures run by the ICCs) using this software e.g. on local machine, on test environment in devel Lan, on pre-processing environment on the operational LAN, such that confirmation can be given to the Core CCB that the expected differences e.g. fixed SxRs, as defined in the delivery note are correct for the HSC produced data set.

7. At the next Core CCB meeting, the DP operator participates and confirms that all tests have taken place and all inputs are available for the SPG to take into account the updated software. The CCB approves the update and agrees to their use.

8. The DP pipeline Operator then proceeds (with support from the Configuration Control Engineer) to update the Operational software with the new installation of the pipeline.

9. The DP Pipeline Operator then informs the relevant individuals at the ICC and HSC that the updated software has been introduced into the pipeline via the following email addresses : herdp_ta@sciops.esa.int & TBD for ICCs. Spot checks shall be made by the DP Pipeline Operator on the results from the updated pipeline.

10. The Calibration Scientist@ICC closes any associated HCSS SxRs (if relevant) upon confirmation of its successful incorporation into the pipeline.

6. Data Quality Control Analysis interactions

6.1 Data Quality Control & its procedures at HSC

Every Herschel observation being processed by the Standard Product Generation (SPG) framework will include quality data. The Quality Control is divided in two different steps:

- Automatic Quality Control Pipeline. The quality data (flags, specific logs, previews…) is automatically created during the processing of an observation and stored in the Quality Control Report (QCR) for its later analysis.
- Manual Quality Control analysis which is the inspection and evaluation of the QCR automatically generated by the SPG framework.

The starting point of the actvities described here is the automatic generation of a QCR during the processing of an observation (Quality Control Level 0). The SPG framework generates a ticket in a kayako system (used for the QCR administration) which contains a link to the QCR.

6.2 Quality Control analysis flow

The manual Quality Control analysis is divided into three different levels:

- Quality Control Level 1 (QCL1): This is the first step in the analysis of the observation and is executed by the Scientific Product Analyst (SPA). During this phase, some basic checks, using well known rules (TBW) are performed on the QCR. At the end of this process, the SPA decides if the observation passes or needs further analysis at level 2 or level 3.
- Quality Control Level 2 (QCL2): This analysis is performed by the Instrument Calibration Scientists (CS) on those observations forwarded by the SPA which are affected by processing problems or instrument malfunction. The CS forwards the result of his/her analysis back to the SPA.
- Quality Control Level 3 (QCL3): This phase is performed by an astronomer of the Herschel Community Support Group (HCSG) on those observations forwarded by the SPA because they possibly need to be re-scheduled. The member of the HCSG forwards the result of his/her analysis back to the SPA.

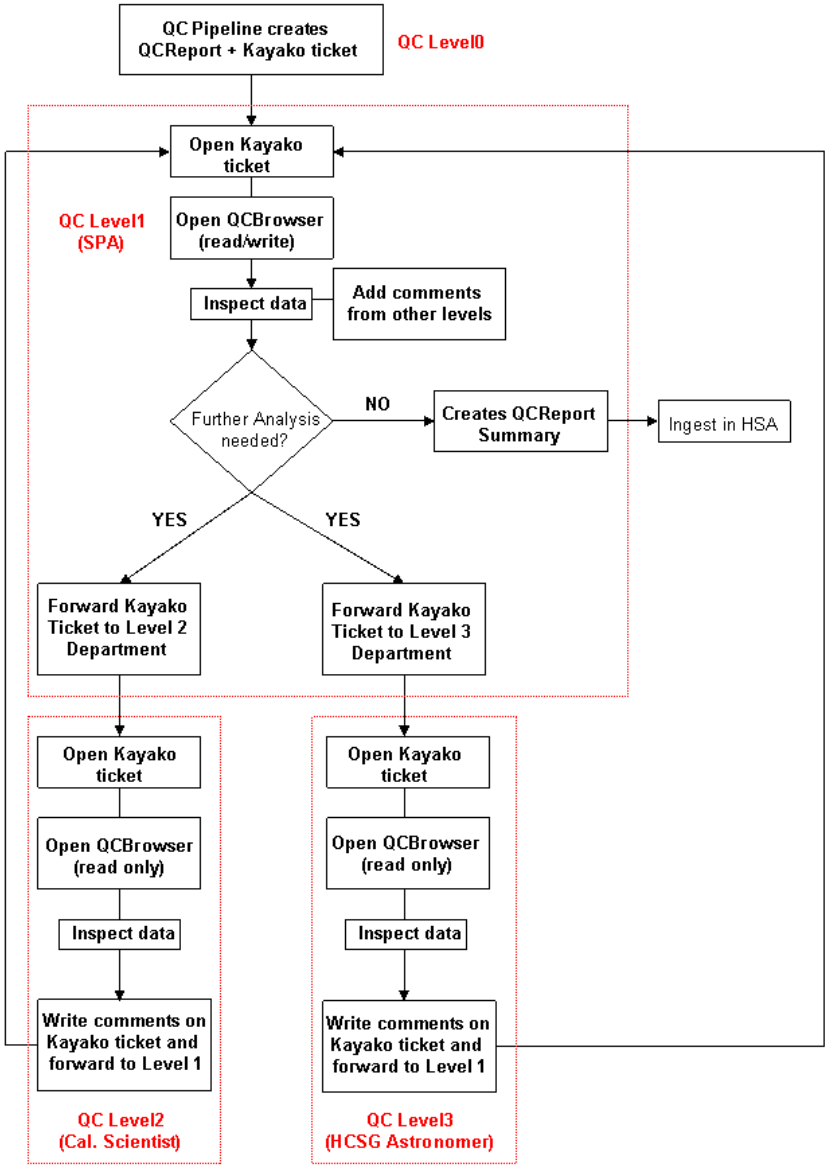
There is a fourth level of Quality Control (QCL4) which represents those situations where the owner of the observation requests further analysis of its quality through Helpdesk. In these cases the astronomer of the HCSG initialises the process (TBD).

All possible Quality Control analysis cases follow the next basic guidelines:
- SPA must look systematically at all the observations at least once after the first processing.
- SPA distributes problematic cases to the CS and the HCSG members.
- All possible cases of rescheduling go to QCL3.
- If the HCSG astronomer need a deeper analysis of the observation at level 2 to decide or CS considers that the problem should be reviewed at level 3, the request is always made through the SPA. This means that there is no direct inter-change of communication between level 2 and level 3.

6.3 Data Quality Control Analysis interactions between HSC & ICC

Quality Control Analysis is managed with the same Kayako system used by the Helpdesk. In this case every Quality Control Report (QCR) automatedly generated by the pipeline will be assigned a ticket number.

The interactions expected with the ICCs (HIFI, PACS and SPIRE) are limited to level 2 interactions i.e. those QC reports requiring a Level 2 analysis by the instrument experts which have been addressed by the HSC experts but require further inputs from the ICCs(see flow diagram below). This is something to be decided by the SPAs after QC Level 2.



The intention is that staff accounts will be assigned to pre-identified individuals at the corresponding ICCs so that they can have access to these Kayako departments when they are requested to provide comments on a specific observation. They answer the ticket suggesting what text to add to the report and then the SPA append these comments to the QCR.

The way the work related to QC Level 2 will be distributed among HSC Calibration Scientists and ICC Calibration Scientists shall be such that the ICCs are only to be contacted as a second line of defence for QC at level 2.

7. Community Support Interactions

7.1 Dealing with Helpdesk Questions

7.1.1 The Herschel Helpdesk @HSC and @ ICCs

The purpose of the HSC Helpdesk is to answer questions from Herschel users. The Helpdesk tool has been developed by Kayako, eSupport v. 3.00.32. It is installed on the Herschel web server and can be viewed at http://herschel.esac.esa.int/helpdesk

Every submitted question (ticket) has automatically a reference number, which is notified to the user both via e-mail and web browser. Both user and agent can append many replies to a question.

Each ICC shall also have their own helpdesk which shall deal with internal questions being made within the ICC related to their instrument & pipelines.

Further details of this are defined in the next section.

7.1.2 HSC-ICC Helpdesk Interactions

The interface between the two helpdesks shall be the Instrument Calibration Scientist(s) based at the HSC. They shall have staff accounts at both helpdesks and as such, are permanently informed on the questions arriving at both helpdesks. Transferring tickets from one helpdesk to the other is his/her interface task.

The exchange of tickets between both Helpdesk systems in just two particular cases (SPIRE is used as an example here):

i) when a ticket arrived at the HSC Helpdesk refers to a SPIRE-specific issue which cannot be directly answered by the SPIRE Calibration Scientist at the HSC (e.g. because it contains a question which requires the specific expertise from someone at the SPIRE ICC on a particular problem).

ii) when a ticket arrived at the SPIRE Helpdesk refers to a non-SPIRE specific issue which should have better been directed to the central HSC Helpdesk

In case i), the SPIRE Calibration Scientist at the HSC will:

- raise a new ticket at the SPIRE ICC Helpdesk (and appropriate Department) containing the question from the user,
- wait until an answer is provided through the SPIRE Helpdesk by the corresponding expert at the ICC, and
- communicate the answer to the user through the HSC Helpdesk. The ticket will start with the sentence: "Your ticket was transferred to the SPIRE ICC Helpdesk and this was the answer provided:". And it should be formally ended with the following signature: "'SPIRE-ICC-member-name-who-provided-the-answer' for the SPIRE Instrument Control Centre Helpdesk".

In case ii), the SPIRE Helpdesk operator will take one of the following actions:

ii-a) answer the question directly from the SPIRE Helpdesk (especially if this is a very general one) informing the user that similar questions in the future should be better addressed to the central HSC Helpdesk.

ii-b) in case the question requires a formal answer by the HSC Helpdesk and/or the answer is unknown by the SPIRE Helpdesk operator, he/she will transfer the ticket ownership to the SPIRE Calibration Scientist, who will:

- raise a ticket at the HSC Helpdesk (and appropriate Department) with the question received from the user
- wait until an answer is provided through the HSC Helpdesk
- communicate the answer to the user through the SPIRE ICC Helpdesk. The ticket will start with the sentence: "Your ticket was transferred to the Herschel Science Centre Helpdesk and this is the answer provided:" And it should be formally ended with the following signature: "'HSC-member-name-who-provided-the-answer' for the Herschel Science Centre Helpdesk"

The main points to note therefore is that:

i) the user should always receive the answer from the same Helpdesk to which the question was addressed.
ii) it should always be clear who generated the answer to the message, if it was a different Helpdesk.

Finally, it should be noted that the Calibration Scientist@HSC for each instrument will have access to the ICC dedicated helpdesk.

8. MPS & PHS Interactions – Uplink Cus/Cal file updates

8.1 Astronomer AOT CUS/Cal File updates at the HSC - Prelaunch

The contents of this section has been removed in Issue 1.3 of the document as it was very much specific to pre-launch CUS backend deliveries to the HSC to support AO Calls.

This approach is not relevant any more as the astronomer backend is now being delivered on a gradual basis by the ICCs as they release their AOTs.

For the purpose of how these deliveries shall be made for AOT release etc, please see Section 8.4.

8.2 HSC-ICC MPS Interactions – during the Commissioning phase

8.2.1 Introduction

The Herschel Science Centre has validated the delivery mechanism of calibration observations & associated data with the ICCs through the execution of 3 dedicated PV Phase Scenario tests, 1 per ICC.

This interface is such that the ICCs shall plan & schedule the observations they wish to have performed during their pre-assigned Operational Days and shall deliver this schedule to the HSC with all associated supporting data.

Nominally this interface is planned to be used in earnest during the PV phase. However as the Mission Planning System will also be used during some Commissioning phase activities then the procedure validated for the PV phase deliveries becomes also applicable for the Commissioning Phase deliveries.

For the commissioning phase each ICC shall have a preassigned set of operational days, although it is not ruled out that some sharing of ODs may occur to maximise spacecraft time efficiency. Project is responsible for defining the assignment of ODs through the Commissioning Phase Operations Plan (H-CPOP) and associated timelines. Deliveries made to the HSC shall be based upon this

As it is clear that these operational days may move based upon visibility periods, launch slips, etc etc then a process of configuration control must be set in place to avoid the HSC utilising the wrong deliveries from the ICCs.

Configuration Control on the CVS – OD tar files are not ICC specific

On the CVS there is a dedicated joint folder for the commissioning & pv phase which has subfolders corresponding to the ODs specific to these phases. All relevant Operational Day deliveries shall be made to this folder & the associated subfolder. Deliveries, and updates to those deliveries, shall be made following an agreed naming convention & data format which is described later in this subsection.

The Commissioning Phase Timeline

Project are responsible for the maintenance & update prior to & during the commissioning phase of the commissioning phase timeline.

This is the prime input to the ICCs in the generation of their Commissioning phase deliveries to the HSC & associated updates after that time.

The HSC shall use this timeline & schedule in the merging together of all deliveries from the ICCs.

It is expected that the delivery of the inputs for the commissioning phase from the ICCs to HSC shall be based upon a formal issue of this timeline to ensure that all parties work against the same baseline.

It is understood however that the timeline will change prior to and following launch for which project will organise appropriate telecons/meetings to discuss the impacts of the change with the HSC & the ICCs. Prior to Operations this will be via updates to the H-CPOP and associated timelines. Once the programme enters

its operational phase (typically a few days/weeks before launch), updates will be made via appropriate operations/ management processes as defined in the H-CPOP and/or the HP Commissioning Phase Management Plan (CPMP)

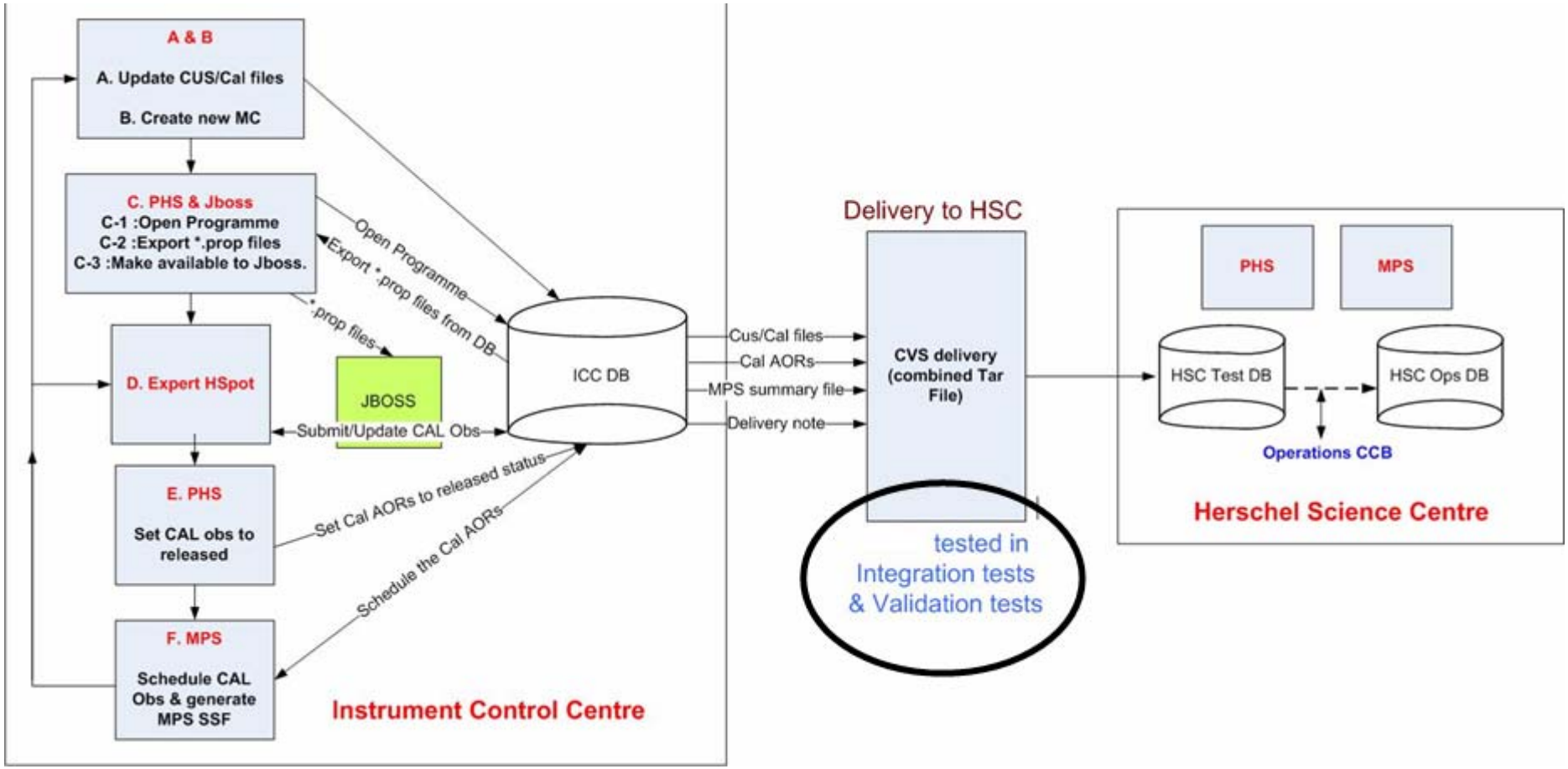
Delivery of the Commissioning Phase inputs to the HSC

Three months before launch, all inputs shall be delivered to the HSC from the ICCs of their assigned commissioning phase ODs.

These inputs are required in this timeframe in order to allow the HSC to merge & plan all ODs (and address/resolve problems that may arise via telecon with the ICCs and project) such that it can deliver a first set of POS files to the MOC approximately 1 month before launch.

The Commissioning Phase Validation Approach

The Drawing on the next page shows the mechanism that has been tested in the PV phase validation tests. This mechanism is also valid for the Commissioning phase deliveries.


A & B
A. Update CUS/Cal files
B. Create new MC
C. PHS & Jboss
C-1 :Open Programme
C-2 :Export *.prop files
C-3 :Make available to Jboss.
Open Programme
Export *.prop files from DB
*.prop files
D. Expert HSpot
JBOSS
Submit/Update CAL Obs
ICC DB
E. PHS
Set CAL obs to released
Set Cal AORs to released status
Schedule the Cal AORs
F. MPS
Schedule CAL Obs & generate MPS SSF
Instrument Control Centre
Cus/Cal files
Cal AORs
MPS summary file
Delivery note
Delivery to HSC
CVS delivery (combined Tar File)
tested in Integration tests & Validation tests
PHS
MPS
HSC Test DB
HSC Ops DB
Operations CCB
Herschel Science Centre

8.2.2 Generating the input tar file for the HSC

The approach to ensure that a self-consistent set of cus scripts & calibration files is delivered to the HSC is as follows :

(i) All updates to the Cus Scripts & Calibration tables since a previous release to HSC must be tracked by an SxR being raised in the HCSS SxR System. In this respect, changes between delivered versions can always be clearly understood by the Core CCB.[2]

(ii) Deliveries can be made in two ways
- A full delivery of all cus scripts & calibration tables from a mission configuration.
- A partial delivery containing an update of specific cus &/or cal tables.

Note : the naming convention of the contents of the delivery shall correspond to the type of delivery being made i.e. Full or Update.

(iii) Deliveries being made by the ICC must always be consistent with the commissioning phase timeline that is maintained by project. If this timeline changes then, following a telecon to be organised by project with the ICC & HSC involvement, the ICCs may be required to redeliver updated files based upon the new ODs assigned.

(iv) The ICC shall then proceed to link their Jboss to this Mission Configuration, submit AORs to the DB and then schedule these AORs with the Mission Planning System – see drawing in previous section. Once it is decided that the contents of the OD is now clear to the ICC then the next step can be taken.

(v) Export all the definitions and calibration tables (and tags) which are in the mission configuration using the following MC naming convention :

ICC_MC_ICCMC_DeliveryType_X_Y_CUS.def
ICC_MC_ICCMC_DeliveryType_X_Y_CUS_CAL.xml

where ICC = SPIRE, PACS or HIFI
MC = Mission Configuration
ICCMC = the ICC Internal mission configuration name (shortened so it can be recognisable by you)
DeliveryType = FULL or UPDATE
X_Y = the version corresponding to the formal delivery of your backend to HSC i.e. 3_0

Example for SPIRE : SPIRE_MC_pv11_FULL_3_0_CUS.def &
SPIRE_MC_pv11_FULL_3_0_CUS_CAL.xml

Example : If the Pacs Mission configuration is called "pacs_phs_config" in their operational DB e.g lab_db@localhost, and they have already delivered 2 MCs to the HSC then export the definitions/cal tables using the command below :
cus -export PACS_MC_pacsphsconfig_FULL_3_0_CUS.def –exportcaltables PACS_MC_pacsphsconfig_FULL_3_0_CUS_CAL.xml - config pacs_phs_config -properties hcss.cus.database=lab_db@localhost

[2] It could be considered to create dedicated CVS directories for Commissioning Cus script changes e.g. PHS_C_PACS

(vi) Provision of Mission Planning Files : Rename the MPS export file (SSF) to correspond to the OD in question : PACS_SSF_ODNNNN_X_Y.ssf. Also rename the MPS POS file (POS) to correspond to the OD in question : PACS_POS_ODNNNN_X_Y.pos. Finally rename the MPS ICP file (ICP) to correspond to the OD in question : PACS_ICP_ODNNNN_X_Y.icp.

(vii) Using the PropHandler Application, extract the AORs scheduled for a particular Operational Day into a .aor file and give it the name : PACS_AOR_ODNNNN_X_Y.aor

(viii) In addition, the ICC shall provide a set of command scripts that when executed will run through all Observing mode cus scripts with default parameters and print the results to a file. The file when generated at the ICC shall be be delivered also in this delivery with the title (e.g. for PACS), PACS_Durations.txt. This file would then be compared with what HSC produces to verify the same result.

(ix) A Readme file is generated as a final file – the contents of the Readme file is described in the next section.

(x) Tar the following files into a single file
- PACS_MC_ICCMC_DeliveryType_X_Y_CUS.def
- PACS_MC_ICCMC_DeliveryType_X_Y_CUS_CAL.xml
- PACS_SSF_ODNNNN_X_Y.ssf
- PACS_POS_ODNNNN_X_Y.pos
- PACS_ICP_ODNNNN_X_Y.icp
- PACS_AOR_ODNNNN_X_Y.aor
- Command scripts
- PACS_Duration.txt
- PACS_Readme_ODNNNN_X_Y.txt

The tar file shall have the following naming convention :

For a Full delivery

ODNNNN_ ICC_FULL_X_YYYYMMDD.tar

where
N = OD number

ICC = PACS, SPIRE or HIFI
FULL = it is a full (re)delivery for this OD
X = Version number of this FULL delivery (1st delivery = 1, 2nd delivery = 2, etc etc)
YYYYMMDD= year, month & day

For an Update delivery

ODNNNN_ ICC_UPDATE_X_Y_YYYYMMDD.tar

where
N = OD number
ICC = PACS, SPIRE or HIFI
UPDATE = it is a partial (re)delivery for this OD

X = Version number of the FULL delivery to which an update is being made
Y = Version number of this update (1st update = 1, 2nd update = 2, etc etc)
YYYYMMDD= year, month & day

Example:

SPIRE make a full delivery of their backend for OD60 on the 15th March 09. The filename would be :

OD0060_ SPIRE_FULL_1_20090315.tar

A few days later (18th March) SPIRE make an update of this delivery for OD60 with a single cus script changed :

OD0060_ SPIRE_UPDATE_1_1_20090318.tar

A few days later (19th March) they make another update

OD0060_ SPIRE_UPDATE_1_2_20090319.tar

Important Notes:
- It may be that there is more than a single mission configuration used for the generation of all ODs delivered. In this case, the first OD (corresponding to the first use of that MC) will contain the Cus & calibration files dump of the mission configuration.
- The .defs and .xml files need to be created only if a new MC is required for the delivery, otherwise the Readme file should specify which database to use (for instance for OD0065 use PACS_CUS_OD0037.defs and PACS_CUS_CAL_OD0037.xml)

(xi) The ICC CCB shall then be held which shall confirm that the delivery can proceed to the HSC.

(xii) The tar file shall be placed on CVS in the following CVS folder & subfolder corresponding to the ICC delivering the file : develop/data/observingmodes/hscpv/odxxx where xx is the OD number e.g. od012, od147 etc.

(xiii) Inform Herschel project and the HSC of the delivery by sending an email to both mike.krassenburg@esa.int (NOTE : As of Issue 1.3 of this document, no email should be sent to the project) and hscops@sciops.esa.int – in this email confirm the CVS version number of the OD tar file that has been placed on CVS. A template is provided in section 8.1.4 with all fields to be filled in for this delivery.

(xiv) The HSC shall respond to the ICC with copy to project to confirm reception of this delivery.

8.2.3 The contents of the Readme file for the HSC

The Readme file shall consist of the following fields.

1. Date & Time of delivery

2. ICC individual to be contacted where problems arise with the delivery

3. Time range for which the data being delivered is applicable. In this case, reference shall be made to the version number of the commissioning phase timeline used to generate the inputs.

4. Delivery information – names of all files contained in the tar file

5. Cus Script & Calibration files ICC internal configuration control issues
(a) Name of ICC mission configuration from which files were exported (for reference purposes only)
(b) Name of the CVS Tag related to this delivery (if relevant)
(c) Name of the ICC Database containing this delivery (for reference purposes only)
(d) HCSS version used when working with these files

6. AOR File issues
(a) HSpot, PHS & MPS versions used
(b) Number of AOR files delivered in the .aor file
(c) Overall Time Estimation calculated by HSpot - In Hours, Minutes & Seconds

7. Spacecraft Database issues
(a) ICC MIB version applicable to these cus & calibration files
(b) HPSDB version (if known) that contains this MIB
(c) OBSM software version on the instrument applicable to this MIB

8. Go-ahead of the ICC CCB (if applicable)

9. SxRs applicable to the updates of the scripts delivered in this release

10. Additional notes
(a) Update Information : If this corresponds to an update since the last delivery, what should the Uplink Co-ordinator see in the CUSGUI, or in the POS file or in the ICP file to verify the changes. Reasons for such changes would also be helpful.
(b) Mission Planning Notes
- A list with all the solar system objects that are going to be observed. This will include specification of the ephemerides files used and of the constraints (if any) that has to be modified in the MPS properties file.
- IMPORTANT - Specific instructions for the mission planners e.g. HIFI Switch to Standby II needs to be placed in the prior OD etc.

11. CusCmdscript output file (see note below)
(a) Name of CusCmdScript
(b) Expected durations when this is run

Note :

- These shall be a set of command scripts that when executed will run through, as a minimum, all[3] Observing mode cus scripts with default parameters and print the results to a file. This file would then be compared with what HSC produces to verify the same result.
- Time estimation should have to be done using the 'cus -defdurtotal' command which includes the duration of the initial slew calibration block.

[3] It is also acceptable to test only those observing modes that have been changed.

8.2.4 Contents of the Email to be sent to HSC informing of the ICC delivery

This subsection describes a template to be used by the ICCs when they make a delivery to the HSC of a tar file for an OD.

A. ICC DELIVERY TEMPLATE

1. Delivery file, directory & Mission Configuration issues

(a) OD tar file name :
(b) CVS server directory :
(c) Does this delivery include a new Mission configuration?

Answer Guideline for (c) : If yes, provide the name. If no, refer to the previous version.

2. TM & TC issues

(a) What is the # of TC counts for the OD?
(b) Has the TM limit been exceeded?

Answer Guideline : If TC is >17000 or TM limit is exceeded then please flag by "HSC TAKE NOTE". For the TCs, it is useful to put in the # of counts as this helps to ensure that the 34000 limit over 48 hours can be checked for two consecutive ODs.

3. MPS Input file issues

(a) Has a new orbit file been used for the first time in this OD?
(b) Has a new SIAM file been used for the first time in this OD?
(c) Has a new HPSDB file been used for the first time in this OD?

Answer Guideline : The answer to the above questions should only be given if it is the first OD to use that file in the planning process. If it is not the first OD then just write N/A or refer to the file you are using. If the answer to the question is YES, then please provide the appropriate filename. This helps to flag to the HSC a change in file and also ensures that HSC can flag to the ICC if a file was supposed to have been used by them but was not etc etc.

4. Operations Issues

(a) Should FDS disable the checks of Gyro Propagation Requests (ATT_PROP) for this OD?
(b) Are there any Real Time Science Requests in the DTCP?
(c) For PACS, does this OD include burst mode?
(d) TM limit exceeded (>100%) - possibility of dump over two DTCPs?
(e) ICC to add anything specific to this OD which HSC & MOC should be aware of.

Answer guideline for (a) the gyro propagation. If the answer is YES, then Flight Dynamics will not consider On-Ground gyro propagation for this OD. If the answer is NO, then the ICC must have left the required time (1 hour) for FDS to have performed gyro calibration.

Answer guideline for (d) the TM limit. Although the question is asked in point 2, the question here relates to the operational impact. Clearly if we have the tm limit exceeded then we need to flag this to the MOC to warn them. It is also useful to have the ICC be aware already at OD delivery of the possibility of late delivery of some observation data to them.

==========

B. EXAMPLE FOR PACS FOR THEIR OD125 DELIVERY NOTE :

Dear HSC Colleagues,

This e-mail is to notify you that PACS ICC has just uploaded the delivery of PACS PV OD0125 tar file onto the CVS server.

1. Delivery file, directory & Mission Configuration issues

(a) OD tar file name : OD0125_PACS_FULL_2_090910.tar
(b) CVS server directory : develop/data/observingmodes/hscpv/od125
(c) Does this delivery include a new Mission configuration? No the MC sent for OD124 (Version 20.0) should be used.

2. TM & TC issues (HSC TAKE NOTE FOR TM LIMIT)

(a) What is the # of TC counts for the OD? The number of TC_COUNTS in the PACS POS file is 4282.
(b) Has the TM limit been exceeded? YES - 116.1%, but this is for a 33h OD (84.4% for 24h).

3. MPS Input file issues

(a) Has a new orbit file been used for the first time in this OD? No, old orbit file : H20090902_001.LOE.
(b) Has a new SIAM file been used for the first time in this OD? No SIAM file 0122_0001.SIAM
(c) Has a new HPSDB file been used for the first time in this OD? Yes :
HPSDB_MOC_HERSCH_CCS_issueMOC3_200908141600.zip

4. Operations Issues

(a) Should FDS disable the checks of Gyro Propagation Requests (ATT_PROP) for this OD? YES

(b) Are there any Real Time Science Requests in the DTCP? NO

(c) For PACS, does this OD include burst mode? NO

(d) TM limit exceeded - possibility of dump over two DTCPs? YES, The expected TM size is 1591.87MB which might need downlink of some data during DTCP-127 (OD 126 has only 15.1h length).

(e) ICC to add anything specific to this OD which HSC & MOC should be aware of.

The delivery contains the following PACS PV calibration blocks:

* PVPhotSetup_orbit_prologue with CSs on (just wait mode)
* PVPhotFlux 3.2.3A on eps Car (inside DTCP period)

* PVPhotFlux 3.2.4A on eps Car (inside DTCP period)
* PVPhotSpatial 3.1.4C on alp Tau
* PVPhotFlux 3.2.4A on HD 15008
* PVPhotAOTVal 5.1.4E on NGC 1365
* PVPhotFlux 3.2.2A on eps Car (4 times)
* PVPhotFlux 3.2.1B, 7th OD
* PVPhotSpatial 3.1.4A on 3C 345
* PVPhotSpatial 3.1.4C on 3C 345
* PVPhotSpatial 3.1.3A on alp Her
* PVPhotSetup_orbit_epilogue

Please acknowledge receipt of the e-mail and the delivery.
Kind regards,
Ulrich

8.2.5 Feedback of the testing & implementation of this release to the ICCs

1.Only when this delivery has been fully tested on the operational system i.e. import of delivery, creation of mission config, submission of the AORs, scheduling of the AORs and generation of POS files, can this delivery be considered successful.

2. If an error occurs when testing this delivery at the HSC, then the uplink co-ordinator@HSC shall send an email to the ICC informing them that the delivery has been Rejected and that a redelivery is required.

3. The ICC will only be informed of any differences between what the HSC obtains when compared to what the ICC sent. If there are no differences then the HSC shall send the request to the project scientist to approve the OD..

8.3 HSC-ICC MPS Interactions – during the PV phase

8.3.1 Introduction

The Herschel Science Centre has validated the PV phase interface with the ICCs through the execution of 3 dedicated PV Phase Scenario tests, 1 per ICC.

This interface is such that the ICCs shall plan & schedule the observations they wish to have performed during their pre-assigned Operational Days and shall deliver this schedule to the HSC with all associated supporting data.

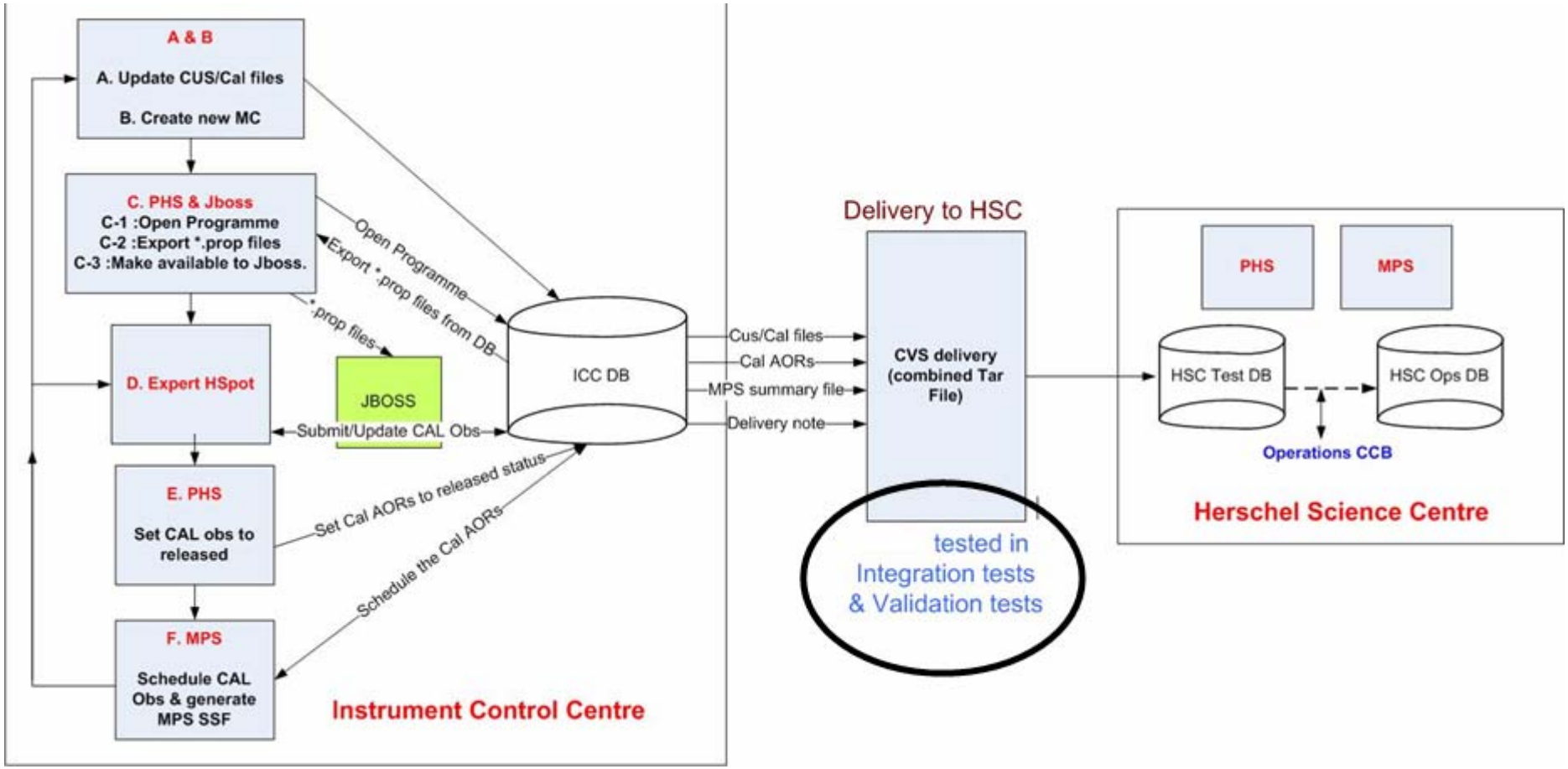
For the case of the PV phase as each ICC does have a pre-assigned set of operational days, and indeed as it is clear that these operational days may move based upon visibility periods, launch slips, etc etc then a process of configuration control must be set in place to avoid the HSC utilising the wrong deliveries from the ICCs.

Configuration Control on the CVS – OD tar files are not ICC specific

On the CVS there is a dedicated joint folder for the commissioning & pv phase which has subfolders corresponding to the ODs specific to these phases. All relevant Operational Day deliveries shall be made to this folder & the associated subfolder. Deliveries, and updates to those deliveries, shall be made following an agreed naming convention & data format which is described later in this subsection.

The PV Phase Validation Approach

The Drawing on the next page show the mechanism that has been tested in the PV phase validation tests. This mechanism has not changed but there do need to be additional Configuration Control issues to be taken into account for operations. These are explained in the next section.


A & B
A. Update CUS/Cal files
B. Create new MC
C. PHS & Jboss
C-1 :Open Programme
C-2 :Export *.prop files
C-3 :Make available to Jboss.
Open Programme
Export *.prop files from DB
*.prop files
D. Expert HSpot
JBOSS
Submit/Update CAL Obs
ICC DB
E. PHS
Set CAL obs to released
Set Cal AORs to released status
Schedule the Cal AORs
F. MPS
Schedule CAL Obs & generate MPS SSF
Instrument Control Centre
Cus/Cal files
Cal AORs
MPS summary file
Delivery note
Delivery to HSC
CVS delivery (combined Tar File)
tested in Integration tests & Validation tests
PHS
MPS
HSC Test DB
HSC Ops DB
Operations CCB
Herschel Science Centre

8.3.2 Generating the input tar file for the HSC

The approach to ensure that a self consistent set of cus scripts & calibration files is delivered for the PV phase to the HSC is as the same as for the Commissioning Phase. Please look at Section 8.2.2 for the details.

8.3.3 The contents of the Readme file for the HSC

The Readme file shall be the same as that for the commissioning phase deliveries. See Section 8.1.3 for the details.

8.3.4 Contents of the Email to be sent to HSC informing of the ICC delivery

See Section 8.1.4 for details.

8.3.5 Feedback of the testing & implementation of this release to the ICCs

1.Only when this delivery has been fully tested on the test system i.e. import of delivery, creation of mission config, submission of the AORs, scheduling of the AORs and generation of POS files, can this delivery be considered successful.

2. If an error occurs when testing this delivery at the HSC, then the calibration scientist@HSC shall send an email to the ICC informing them that the delivery has been Rejected and that a redelivery is required

3. The ICC will only be informed of any differences between what the HSC obtains when compared to what the ICC sent. If there are no differences then the HSC shall send the request to the project scientist to approve the OD..

8.4 HSC-ICC MPS Interactions – Astronomer AOT Deliveries

8.4.1 Introduction

The Herschel Science Centre has received from the the astronomer KPGT and KPOT communities thousands of observations which have been generated with and sent from a HSpot version released for each of these AO programmes.

These HSpot Versions contained a list of AOTs for each instrument which, when selected and assigned specific parameters by the astronomer could then be run against the Cus/Cal file backend located on the HSC Operational server.

This Cus/Cal file backend has been updated a number of times pre-launch, a minimum of once per AO call, based upon formal deliveries being made from the ICCs to the HSC.

This section addresses how updated cus script & calibration tables are to be delivered (in a gradual manner consistent with the slow release of AOTs from the ICCs) to the HSC for incorporation in the operational DB from the mid-PV Phase onwards in order to support (a) HSpot releases to the Astronomer community and/or (b) updates of the backend during operations through use of the instruments in flight.

8.4.2 The two HSC Operational DBs

The HSC has two operational DBs. One which is visible/accessible only by the astronomer and the other which is what is used for planning.

The astronomer DB currently contains the Astronomer AOTs as were delivered by the ICCs a number of months ago to support Phase 3. The updates provided by astronomers to these AOTs are primarily done through their interactions with this DB. These updates can then be fed into the Planning DB through the submission by the Community Support Group of these same “updated” proposals to that DB.

The HSpot (& Jboss) in use with the Astronomer DB is consistent with that version released to the Astronomer community. The HSpot (& Jboss) in use for the planning DB is always the most up to date and is what is in use at the ICCs also for planning purposes.

8.4.3 Delivery to the HSC of the Astronomer Backend – tar filename etc

This section defines in greater detail the interactions to be exercised for delivery of the ICC Astronomer AOT backend to the HSC e .g. tar file names, location, email.

It builds upon the approach defined in sections 8.1 and 8.3.

(a) ICC backends, their contents & the Naming convention to use for an astronomer backend delivery

The ICC Backends can be broken into two parts (i) Calibration AOTs and (ii) Astronomer AOTs. Updates to (i) do not impact (ii) unless specifically defined as such through SxRs.

(i) Calibration AOT mission configuration deliveries

An ICC can deliver a backend which has only changes for the calibration AOTs and does not affect the Astronomer AOTs. In such a case, the naming convention for such Mission Config deliveries shall remain as it is at present i.e.

ICC_MC_ICCMC_DeliveryType_X_Y_CUS.def
ICC_MC_ICCMC_DeliveryType_X_Y_CUS_CAL.xml

This is how deliveries are currently being made by the ICCs (as in section 8.1 & 8.2).

(ii) Astronomer AOT mission configuration deliveries

Where a change does occur in the astronomer part of the backend then the ICC must deliver that mission configuration flagging that the Astronomer part of the backend has been updated. In such a case, the naming convention for such Mission Config deliveries shall be as follows :

ICC_MC_ASTR_ICCMC_DeliveryType_X_Y_CUS.def
ICC_MC_ASTR_ICCMC_DeliveryType_X_Y_CUS_CAL.xml

(b) Tar file name, delivery location, Email & Readme Updates

The tar file naming convention does not change. The tar file for a particular OD delivery may contain an ICC_MC or an ICC_MC_ASTR delivery.

The location for deliveries of these tar files shall remain to be the PV directory on CVS. When we start routine operations then the directory shall change.

Deliveries of an astronomer mission configuration shall be informed by email the same as is done for other ICC deliveries.

The Readme for an astronomer mission configuration shall list the SxRs closed related to the "specific AOT released" in that delivery (or, in the future, for updates to AOTs which have been previously released).

(c) Planning by the ICCs and the HSC of such deliveries

The version numbers of Mission configuration deliveries to the HSC shall continue to be incremented by one, irrespective of whether one delivery is an astronomer one and the next is normal calibration.

The HSC shall always use the most up to date ICC delivered mission configuration for scheduling "released" AOTs. An example of this is :

Monday - SPIRE delivers MC version 23 which is a normal calibration backend update
Tuesday - SPIRE make a change to the MC which affects the Astronomer AOT. This is delivered to HSC and is given version 24 but it has ASTR in its name.
Wednesday - SPIRE delivers MC version 25 which is a normal calibration backend update i.e. no astronomer AOTs are affected.
Friday - HSC starts to schedule its next two SDP ODs. HSC links the AORs to SPIRE MC version 25.

The point of this is that the HSC always knows when an astronomer AOT has been updated i.e. version 24.

The Mission Configuration delivered by the ICC ALWAYS contains the most up to date calibration backend + the Astronomer backend. If the astronomer backend is not updated for 10 versions, then the HSC can safely schedule SDP ODs against version 34 seeing as its Astronomer backend has not been changed.

(d) When to inform HSC of a delivery which contains an astronomer AOT backend update

Before making a delivery to the HSC, the ICC should check for dependencies to confirm that changes made since the last delivery do NOT affect the ASTR AOTs. If there are changes then the MC is called ICC_MC_ASTR_xxxxxx (as in (b) above). If not then it gets called ICC_MC_xxxxxx

One proposal made on how to do this is :

- check SxRs what has been implemented for MCx
- make a list of cus definitions what has been updated for these SxRs
- check which high level observing modes are affected by these changes with "cus -defdependee <updated cus definitions>"
- if dependees include the accepted AOT (e.g. PacsPhoto) or updated calU file(s) has an impact on the accepted AOT then "_ASTR_" has to be given in the MC name and the readme file has to list the relevant SxRs

8.4.4 Informing the HSC & the Core CCB on delivery of a new ASTR MC

1. Delivery notification Email

There is a specific section in the delivery notification email which asks whether an ASTR MC is being delivered or not. It specifically states that if there is such a delivery then the Core CCB shall be copied in the email.

The approach defined below shall also require that a high level SCR shall be raised to flag that an ASTR MC has been delivered to the HSC & core CCB.

2. How to formally flag for the Core CCB the contents of an ASTR Mission Configuration

I recommend that delivery of an ASTR MC shall result in the creation of a High Level SCR which refers to those SCRs implemented that affect the astronomer AOTs since the last ASTR MC. I recommend this because at present the location where this information is held is in the Readme and for operational tracking purposes we should have it in the JIRA system.

(a) Where in JIRA to raise the high level SCR

The High Level SCR shall be raised in one of the following JIRA sub-projects (which have always been the location for changes in Astronomer backends) :

- For HIFI : phs_observingmodes_hifi

- For PACS : phs_observingmodes_pacs

- For SPIRE : phs_observingmodes_spire

The SCR should be assigned to Mark Kidger.

(b) Title of the SCR

The title of the SCR shall be :

New Astronomer Mission Configuration : ICC_MC_ASTR_ICCMC_CNNN_X

where ICC = SPIRE, PACS or HIFI
MC = Mission Configuration
ASTR is an astronomer delivery
ICCMC = the ICC Internal mission configuration name (shortened so it can be recognisable by you)
CNNN = the cycle to which the delivery is being made
X = the version corresponding to the formal delivery of your backend to HSC i.e. 3

Note : The above naming convention is what is used already in the naming of the MC delivered to the HSC

(c) Contents of the High Level SCR

The delivery of an ASTR MC results from one of two main activities :
- First release of an AOT
- Update of the backend of a released AOT.

For the delivery of an ASTR MC, then the SCR shall list the lower level ICC SxRs that have been implemented since the last ASTR MC delivery that affect the Astronomer AOTs. In such a case, there are two ways this can be done :

- In the high level SCR you list the AOT implicated and the changes to each of those AOTs

- You do what SPIRE does : SPIRE, for example, in their delivery SPIRE_MC_ASTR_pv52_FULL_34_0 - generated an SCR in their system per Astronomer AOT that lists the changes for that specific AOT e.g. SPIRE-2077 & SPIRE-2078. In this case, the high level SxR raised would refer to SPIRE-2077 & 2078 which then refer to further lower level SPIRE SxRs. It is worth pointing out that in the SPIRE approach this would result in three levels of SCRs i.e. High level SCR notification to HSC points to e.g. 2 lower level SCRs referring to changes to 2 AOTs, which then point to the lower level SCRs.

My recommendation for SPIRE is that it is their choice whether they wish to raise these middle SCRs or whether in the high level SCR you list the AOT implicated and the changes to that AOT i.e. the first way above.

3. Core CCB or Fast Track Core CCB review of the SCR

Depending on the urgency e.g. in the current phases we're in we may need to call a fast track CCB after a briefing, the Core CCB will perform the following activities :

- With the ICC in attendance, the core CCB will review the contents of the High Level SCR and then proceed to the lower level SCRs reviewing in each case any implications on the Routine Phase AOR programme.

- Upon assignation of actions (if required) e.g. inform Astronomers to update AORs, Community Support Group changes the AORs etc etc, then rollout is approved
- Upon importing of the Mission Configuration into the DB & assignation of AORs to that Mission Configuration, the Uplink Co-ordinator closes the high level SCR.

8.4.5 Feedback of the testing & implementation of this release to the ICCs

1.Only when this delivery has been fully tested on the test system i.e. import of delivery, creation of mission config, submission of the AORs, scheduling of the AORs and generation of POS files, can this delivery be considered successful.

2. If an error occurs when testing this delivery at the HSC, then the Uplink Co-ordinator@HSC shall send an email to the ICC informing them that the delivery has been Rejected and that a redelivery is required

8.5 Delivery of Calibration Observations during the Routine phase

8.5.1 Introduction

The ICCs will only need to perform 'proper' mission planning during the Commissioning & PV Phases.

During the Routine Phase they are required to provide in a timely fashion a set of AORs as part of calibration proposals to be executed during their predefined calibration periods scheduled for their instrument. In this respect, the ICCs are not expected to produce any SSF files during the Routine Phase.

ICC Engineering Observations used to setup & place into standby/safe mode their instrument will nominally be created by the HSC using the most recent mission configuration, unless otherwise informed by the ICC.

In addition to the above, the following recommendations have also been made to the ICCs for these deliveries :

- We recommend to continue to send HSC a CUS duration check script with a new mission configuration. PACS will need to determine if they will send a POS file just for these checks or whether to change their scripts.

- If there are two mission configurations being delivered to be used in a cycle then they should come in a separate tar file with the AOR file to be used with it + Readme.

- We recommend delivery of all Routine Calibration AORs in a single AOR file unless two mission configurations are envisaged to be used in a single cycle. Then of course you get two AOR files in two separate tar files. If the ICC wishes to separate their AORs into e.g. sub-instrument, a number of AOR files, then this of course can be done as long as they flag in the name what is the difference between them.

- The Readme should define (if relevant) the order in which you wish to schedule AORs in the subinstrument OD + additional scheduling instructions you deem necessary/relevant.

8.5.2 Generating the input tar file for the HSC

The approach to ensure that a self-consistent set of cus scripts & calibration files is delivered to the HSC is as follows :

(i) All updates to the Cus Scripts & Calibration tables since a previous release to HSC must be tracked by an SxR being raised in the ICC & HCSS SxR System. In this respect, changes between delivered versions can always be clearly understood by the Core CCB.

(ii) Deliveries of cus scripts & calibration tables shall only be as FULL Mission Configuration Deliveries. No partial deliveries shall be made. It may be that there is more than a single mission configuration required to be used in a cycle. Separate tar files shall be delivered as mentioned below which contain a self-consistent set of AORs + Readme + MC.

(iii) Export all the definitions and calibration tables (and tags) which are in the mission configuration to be used in a cycle using the following MC naming convention :

a. Calibration AOT mission configuration deliveries

An ICC can deliver a backend which has only changes for the calibration AOTs and does not affect the Astronomer AOTs. In such a case, the naming convention for such Mission Config deliveries shall be i.e.

ICC_MC_ICCMC_CNNN_X_CUS.def
ICC_MC_ICCMC_CNNN_X_CUS_CAL.xml

where ICC = SPIRE, PACS or HIFI
MC = Mission Configuration
ICCMC = the ICC Internal mission config name (shortened so it can be recognisable by you)
CYCLENNN = the cycle to which the delivery is being made
X = the version corresponding to the formal delivery of your backend to HSC i.e. 3

Example for SPIRE which makes a Mission Config :
SPIRE_MC_pv11_C016_3_CUS.def & SPIRE_MC_pv11_C016_3_CUS_CAL.xml

b. Astronomer AOT mission configuration deliveries

Where a change does occur in the astronomer part of the backend then the ICC must deliver that mission configuration flagging that the Astronomer part of the backend has been updated. In such a case, the naming convention for such Mission Config deliveries shall be as follows :

ICC_MC_ASTR_ICCMC_CNNN_X_CUS.def
ICC_MC_ASTR_ICCMC_CNNN_X_CUS_CAL.xml

where ICC = SPIRE, PACS or HIFI
MC = Mission Configuration
ASTR is an astronomer delivery
ICCMC = the ICC Internal mission config name (shortened so it can be recognisable by you)
CNNN = the cycle to which the delivery is being made

X = the version corresponding to the formal delivery of your backend to HSC i.e. 3

Example for SPIRE :
SPIRE_MC_ASTR_pv11_C016_3_CUS.def & SPIRE_ASTR_MC_pv11_C016_3_CUS_CAL.xml

(iv) Provision of Mission Planning Files : None required.

(v) Using the PropHandler Application is still recommended for the extraction of AORs as one can query on proposal/observation and there is a column showing the mission configuration which helps the user to know that they are linked to the correct MC. In any case, extract the AORs that you wish to provide for a specific cycle into a .aor file and give it the name : - PACS_AOR_CNNN_X.aor whereby X corresponds to the HSC mission configuration version (see above e.g. 3). Perform a time estimation on this file against your TBD mission configuration and then save the file. The TBD mission configuration is the one which you shall refer to in the Readme as being applicable for scheduling these AORs against. Note - If there is no mission configuration to deliver for a cycle then the X will refer to the version last delivered

(vi) In addition, the ICC shall provide a set of command scripts that when executed will run through all Observing mode cus scripts with default parameters and print the results to a file. The file when generated at the ICC shall be be delivered also in this delivery with the title (e.g. for PACS), PACS_Durations.txt. This file would then be compared with what HSC produces to verify the same result.

(vii) A Readme file is generated as a final file – the contents of the Readme file is described in the next section. The Readme name shall be ICC_Readme_CNNN_X.txt where ICC = PACS/SPIRE/HIFI, CNNN is the Cycle number & X corresponds to the HSC Mission Configuration version to be used with this AOR file e.g. 3.0 as mentioned above. Note - If there is no mission configuration to deliver for a cycle then the X will refer to the version last delivered

(viii) Tar the following files into a single file
- PACS_MC_ICCMC_CNNN_X_CUS.def
- PACS_MC_ICCMC_CNNN_X_CUS_CAL.xml
- PACS_AOR_CNNN_X.aor
- PACS_Readme_CNNN_X.txt
- Command scripts
- PACS_Duration.txt

Note - If there is no mission configuration to deliver for a cycle then the X will refer to the version last delivered
The tar file shall have the following naming convention :

CYCLENNN_ ICC_Deliverytype_Q_R_YYYYMMDD_Z.tar

where
N = Cycle number
ICC = PACS, SPIRE or HIFI
Delivery type - FULL - it is a full (re)delivery for this cycle or UPDATE - it is an update e.g. only of the AOR file or Readme
Q_R = Version (mandatory) & Subversion number (optional) of this delivery
YYYYMMDD= year, month & day

Z = A, B, etc - shall be used if there are two tar files being delivered for the same cycle - this is only applicable for a cycle containing multiple mission configurations

Example for SPIRE where SPIRE make a delivery and then need to update the Readme or AOR file

SPIRE make a full delivery for Cycle 15 on the 30th July 2010. The filename would be :

CYCLE015_ SPIRE_FULL_1_0_20090730.tar

A day later (31st July) they make another update just to the AOR file

CYCLE015_ SPIRE_UPDATE_1_1_20090731.tar

Example for HIFI whereby the cycle contains two Mission Configs

HIFI make a full delivery for Cycle 20 on the 15th October 2010. There are two mission configs to be used in the cycle. The filenames would be :

CYCLE020_ HIFI_FULL_1_0_20091015_A.tar
CYCLE020_ HIFI_FULL_1_0_20091015_B.tar

(ix) The ICC CCB shall be held e.g. SPIRE for ASTR releases, which shall confirm that the delivery can proceed to the HSC.

(x) The tar file shall be placed on CVS in the following CVS folder & subfolder corresponding to the ICC delivering the file : develop/data/observingmodes/rp_cycles/cyclennn where nnn is the Cycle number e.g. cycle008, cycle116, etc.

(xi) Inform the HSC of the delivery by sending an email to hscmps@sciops.esa.int with hscops@sciops.esa.int in copy. In this email confirm the name & location of the tar file that has been placed on CVS. A template is provided in section BBBBB of this document with all fields to be filled in for this delivery.

(xii) The HSC shall respond to the ICC to confirm reception of this delivery.

8.5.3 The contents of the Readme file for the HSC

The Readme file shall consist of the following fields.

1. Date & Time of delivery

2. ICC individual to be contacted where problems arise with the delivery

3. Cycle for which the data being delivered is applicable.

4. Delivery information – names of all files contained in the tar file

5. Cus Script & Calibration files ICC internal configuration control issues
(a) Name of ICC mission configuration from which files were exported (for reference purposes only)
(b) Name of the CVS Tag related to this delivery (if relevant)
(c) Name of the ICC Database containing this delivery (for reference purposes only)
(d) **HCSS Cus version** used when working with these files

6. AOR File issues
(a) HSpot, PHS & MPS versions used : **Note if you don't use MPS then no need to mention it**
(b) Number of AOR files delivered in the .aor file
(c) Overall Time Estimation calculated by HSpot - In Hours, Minutes & Seconds

7. Spacecraft Database issues
(a) ICC MIB version applicable to these cus & calibration files
(b) HPSDB version (if known) that contains this MIB
(c) OBSM software version on the instrument applicable to this MIB

8. Go-ahead of the ICC CCB (if applicable)

9. SxRs applicable to the updates of the scripts delivered in this release
- If there is an ASTR Mission Configuration delivery, **then flag the high level SxR which contains this list.**

10. Additional notes
(a) Update Information : If this corresponds to an update since the last delivery, explain what the updates consist of e.g. 2 more AORs added.
(b) Instructions for the Mission Planners
A list with all the solar system objects that are going to be observed. **This will include specification of the constraints** (if any) that has to be modified in the MPS properties file.

11. CusCmdscript output file (see note below)
(a) Name of CusCmdScript
(b) Expected durations when this is run

Note : These shall be a set of command scripts that when executed will run through, as a minimum, all Observing mode cus scripts with default parameters and print the results to a file. It is also acceptable to test only those observing modes that have been changed. This file would then be compared with what HSC produces to verify the same result. Time estimation should have to be done using the 'cus -defdurtotal' command which includes the duration of the initial slew calibration block.

8.5.4 Contents of the Email to be sent to HSC informing of the ICC delivery

This subsection describes a template to be used by the ICCs when they make a delivery to the HSC of a tar file for a Cycle

Note : various answers are possible - Block letters should be used - YES, NO & N/A (Not Applicable)

2A. ICC DELIVERY TEMPLATE FOR ROUTINE CALIBRATION OBSERVATION DELIVERIES

1. Delivery file, directory

(a) Cycle tar file name(s) :
(b) CVS server directory :

Answer Guideline for (a) : If there are two tar files (two MCs delivered) then list them

2. Mission Configurations
(a) Does this delivery include a new Calibration Mission configuration(s)?
(b) Does this delivery include a new ASTR mission configurations(s)?
(c) If the answer to point (b) is YES, then have you copied the cCCB@sciops.esa.int in this delivery email?

Answer Guideline for (a) : If yes, provide the name. If no, refer to the previous version.
Answer Guideline for (b) : If yes, provide the name & copy cCCB@sciops.esa.int in this delivery email. If no, then no further information is required.

3. Operations Issues (TC, HPSDB, SIAM, Real Time Science)

(a) Will any of these delivered observations generate a significant amount of Telecommands?
(b) Do you wish to have these calibration observations scheduled in the Real Time Science period of the DTCP?
(c) ICC to add anything specific to this OD which HSC & MOC should be aware of

Answer Guideline for (a) : If these calibration observations will generate a significant amount of Telecommands then please flag it. A value is not required but at least it allows the HSC to know that it has to check the POS just in case the final # of TCs are >17000. Example : BSM tuning procedure.
Answer Guideline for (c) : This question is not intended to replace what is in the Readme but clearly if there is something important to flag e.g. specific HPSDB to use, SIAM to use, then you can define it here.

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2B. EXAMPLE FOR PACS FOR THEIR CYCLE 15 DELIVERY NOTE :

Dear HSC Colleagues,

This e-mail is to notify you that PACS ICC has just uploaded onto the CVS server two tar files corresponding to Routine Phase Cycle015.

1. Delivery file, directory

(a) Cycle tar file name(s) : Two tar files are provided

CYCLE015_ PACS_FULL_1_20100612_A.tar
CYCLE015_ PACS_FULL_1_20100612_B.tar

(b) CVS server directory : develop/data/observingmodes/rp_cycles/cycle015

2. Mission Configurations

(a) Does this delivery include a new Calibration Mission configuration(s)? YES (there are two - one per tar file)
PACS_MC_rp205_C015_78_CUS.def & PACS_MC_rp205_C015_78_CUS_CAL.xml
PACS_MC_rp206_C015_79_CUS.def & PACS_MC_rp206_C015_79_CUS_CAL.xml

(b) Does this delivery include a new ASTR mission configurations(s)? NO

(c) If the answer to point (b) is YES, then have you copied the cCCB@sciops.esa.int in this delivery email? N/A

3. Operations Issues (TC, HPSDB, SIAM, Real Time Science)

(a) Will any of these delivered observations generate a significant amount of Telecommands? NO

(b) Do you wish to have these calibration observations scheduled in the Real Time Science period of the DTCP? NO

(c) ICC to add anything specific to this OD which HSC & MOC should be aware of? There is a new HPSDB applicable from OD296 in Cycle 15 which should be used for the second mission configuration (HSC version 79).

Please acknowledge receipt of the e-mail and the delivery.
Kind regards,
Ulrich

8.5.5 Feedback of the testing & implementation of this release to the ICCs

1.Only when this delivery has been fully tested on the operational system i.e. import of delivery, creation of mission config, submission of the AORs, scheduling of the AORs and generation of POS files, can this delivery be considered successful.

2. If an error occurs when testing this delivery at the HSC, then the uplink co-ordinator@HSC shall send an email to the ICC informing them that the delivery has been Rejected and that a redelivery is required.

3. The ICC will only be informed of any differences between what the HSC obtains when compared to what the ICC sent. If there are no differences then the HSC shall send the request to the project scientist to approve the OD..

8.6 SPIRE ICC to PACS ICC Parallel mode Interactions

8.6.1 Introduction

As parallel mode observations are based upon the cus & cal backends from both SPIRE & PACS, then an interaction is required directly between these two centres to allow intra-delivery of their instrument mission configurations.

The approach on how these deliveries are announced, delivered & processed, are covered in this section.

8.6.2 SPIRE Parallel Mode Cus Script Responsibilities

A. Cooler Recycling Engineering Scripts

Proposed updates to these scripts are performed through the raising of an SCR on PHS_Observingmodes_spire. SPIRE are responsible to maintain these scripts. If PACS wish to make an update to the Parallel Mode cooler recycle main script which is under SPIRE responsibility, then they raise an SCR and it is implemented by SPIRE.

B. Standard Parallel AOT cus script maintenance & updates

As SPIRE are the prime instrument for parallel mode and as all parallel mode cus scripts are delivered within the instrument model then SPIRE are responsible to deliver this to the HSC taking into account updates provided to them by PACS ICC.

8.6.3 PACS & SPIRE Intra-deliveries – Standard interaction rules

This subsection describes how shall each ICC inform one another on the right backend to use for import at PACS & import at SPIRE

A. PACS deliveries to SPIRE

- PACS Export from their "parallel" instrument model their backend.
- This export is tarred and placed on the CVS in the /develop/data/observingmodes/parallel/toSpire directory
- PACS raise an SCR on the PHS_Observingmodes_SPIRE SxR pages to inform of a delivery of their parallel mode exported backend on the CVS.
- PACS send an email (with copy to HSC) to the SPIRE Operations email address to inform of this delivery
- If there is something that the HSC should take note of then this should be made clear in that email.
- When SPIRE ingest the delivery then it sets the SCR as implemented and informs PACS.
- PACS closes the SCR

B. SPIRE deliveries to PACS

- SPIRE Export from their "parallel" instrument model their backend.
- This export is tarred and placed on the CVS in the /develop/data/observingmodes/parallel/toPacs directory
- SPIRE raise an SCR on the PHS_Observingmodes_PACS SxR pages to inform of a delivery of their parallel mode exported backend on the CVS.
- SPIRE send an email (with copy to HSC) to the PACS Operations email address to inform of this delivery
- If there is something that the HSC should take note of then this should be made clear in that email.
- When PACS ingest the delivery then PACS sets the SCR as implemented and informs SPIRE. SPIRE then closes the SCR

C. SPIRE deliveries of their instrument model to the HSC

- This follows the standard delivery mechanism
- However, SPIRE shall refer in their readme.txt to the PACS SCRs which are closed in the instrument model that they are delivering

8.6.4 PACS & SPIRE & HSC Intra-deliveries – Quick Turn-around time rules

This subsection addresses the steps to be taken if there is a quick turnaround required and not sufficient time to import at PACS or SPIRE

- SPIRE make a delivery to HSC of their instrument model for an OD which contains the PACS parallel mode backend. HSC processes this delivery & schedules it.
- PACS realise that there is a mistake or they wish to change a script in the parallel mode backend delivered by SPIRE. In this case an SCR is raised to inform of a new 'update" delivery in the PHS_Observingmodes_SPIRE SxR pages.
- SPIRE do not have time to reprocess this SCR and deliver the updated instrument model to the HSC.
- Following agreement with HSC that this is a "quick turnaround scenario' then PACS shall deliver to the CVS in the relevant OD folder an update on “their instrument backend” which contains the single cus or cal tables within a tar file that go in the SPIRE instrument model.
- PACS shall send an email to HSC (copy to SPIRE) informing in the subject "Urgent : PACS Parallel Mode Update for HSC inclusion in SPIRE Instrument model" and shall refer to the SCR raised and to the name of the file delivered
- PACS shall also deliver this update in the /develop/data/observingmodes/parallel/toSpire folder for SPIRE to be able to process when time allows.
- HSC takes responsibility to update the SPIRE instrument model with the PACS delivery
- SPIRE shall update their parallel mode backend as soon as is feasible

8.6.5 Parallel mode deliveries for the Astronomer CUS backend

As SPIRE are responsible to deliver the instrument model containing the PACS parallel mode backend then they must ensure that they are using the correct one. Their Readme file should specify which tar file delivery from PACS they are using.

PACS should deliver their backend in the develop/data/observingmodes/parallel/toSpire folder with a tar file having the naming convention : Astronomer_PacsToSpire_FULL_X_yyyymmdd.tar

SCRs shall be raised by PACS for these deliveries in PHS_Observingmodes_SPIRE

8.6.6 HSC Mission Planning Processing of Parallel Mode ODs

The following rules shall be applied by the HSC MPS operators when scheduling ODs including Parallel mode :

If the OD is only PMODE or PMODE+SPIRE then the scenario is:
- select in smps PARALLEL or PARALLEL+SPIRE
- smps will show all visible AORs which are linked to the SPIRE instrument model i.e. including SpirePacsEng_Parallel_xxx, but not PacsEng_PHOT_orbit_xxxx
- schedule SpirePacsEng_Parallel_xxx around the PMODE block

If the OD is PMODE+SPIRE+PACS or PMODE+PACS then:
- select in smps PARALLEL+PACS or PARALLEL+SPIRE+PACS
- smps will show all visible AORs which are linked to the SPIRE and PACS instrument models i.e. including SpirePacsEng_Parallel_xxx and PacsEng_PHOT_orbit_xxxx
- schedule PacsEng_PHOT_orbit_xxxx around the necessary blocks

8.6.7 Rules for SxR closure & Update deliveries and time between them

A. How to deal with closing of SxRs

If PACS makes a delivery to SPIRE and raises an SCR and then releases another delivery e.g. update, before SPIRE have actually processed the first delivery then SPIRE shall update the original SCR to ask PACS to close it with reference to the latest SCR. In this way, SPIRE recognises the delivery, recognises that it won't use it and recognises that there is a new SCR which governs what is the version of the delivery you wish to use. If 5 deliveries have been made by PACS i.e. 5 SCRs, then when SPIRE proceeds to import the 5th delivery, SPIRE will update these SCRs such that PACS can then close all 5 SCRs with reference to the last SCR raised.

This rule also applies for SPIRE making a delivery to PACS.

B. Delivering updates between the ICCs - the time between updates

For the PV phase deliveries, where an SCR is raised and a delivery made to the CVS, then that ICC should delay making further update deliveries until at least a week has passed e.g. if the ICC making the delivery finds a mistake in that delivery or changes have to be be included which are required then wait at least one week from the last delivery before making another delivery.

This rule however shall be ignored if the receiving ICC sends the sender ICC an email informing that it intends to process its delivery i.e. it is ready to import that ICCs latest delivery. In this case the delivering ICC should make a new delivery if it has found there are changes which must be used.

e.g. SPIRE makes a delivery to PACS. One week later SPIRE makes another delivery. SPIRE then finds an error which needs to be corrected so it prepares an update. PACS sends an email to state that it is now ready to ingest this second delivery. SPIRE informs PACS that a new update delivery is being made to correct an error in delivery 2. SPIRE makes the delivery of the update. PACS processes the update.

8.6.8 Tar file Delivery Naming Conventions

The following are the naming conventions to be used for Tar file deliveries :

A. PACS delivery to SPIRE of their parallel mode backend

Full delivery : Phase_PacsToSpire_FULL_X_yyyymmdd.tar

Update delivery : Phase_PacsToSpire_Update_X_Y_yyyymmdd.tar

where Phase corresponds to Mission Phase i.e. PV, Routine

B. SPIRE delivery to PACS of their parallel mode backend

Full delivery : Phase_SpireToPacs_FULL_X_yyyymmdd.tar
Update delivery : Phase_SpireToPacs_Update_X_Y_yyyymmdd.tar

where Phase corresponds to Mission Phase i.e. PV, Routine

C. Delivery of PACS parallel mode backend update to HSC & Spire - "Quick turn around"

Steps for HSC
- Delivery to the HSC in the specific CVS OD folder shall follow the standard naming convention of an "OD Update delivery" and the Readme shall clearly specify that this is for Parallel mode and is for inclusion in the SPIRE instrument model.

Steps for SPIRE
- Same steps as for an update delivery in point (a) above.

8.6.9 Parallel mode interactions – Example Scenarios

This subsection provides a list of possible scenarios & look at how the above rules should be applied

A. PACS plan a parallel mode OD - which SPIRE delivery are they using?

When PACS is certain that it wishes to perform a planning of a parallel mode OD then the following steps shall be performed e.g. allow 3 days before your planning starts to allow all issues to be resolved.

- PACS shall send an email to SPIRE with subject "PACS Parallel Mode OD planning begins - Configuration information"
- This email shall refer to the PACS & the SPIRE tar files that are to be used in planning this OD
- The email shall specify by when must the other instrument respond.
- SPIRE shall acknowledge reception of this email and shall confirm that the SPIRE tar file delivery referred to in the email is the correct one to use

B. SPIRE plan a parallel mode OD - which PACS delivery are they using?

When SPIRE is certain that it wishes to perform a planning of a parallel mode OD then the following steps shall be performed e.g. allow 3 days before your planning starts to allow all issues to be resolved.

- SPIRE shall send an email to PACS with subject "SPIRE Parallel Mode OD planning begins - Configuration information"
- This email shall refer to the PACS & the SPIRE tar files that are to be used in planning this OD
- The email shall specify by when must the other instrument respond.
- PACS shall acknowledge reception of this email and shall confirm that the PACS tar file delivery referred to in the email is the correct one to use

C. PACS make an update to their Mission Config which affects what SPIRE have in their instrument model for parallel mode OD

See section 8.5.3 point A & 8.5.8 point A above

D. SPIRE make an update to their Mission Config which affects what PACS have in their instrument model for parallel mode OD

See section 8.5.3 point B & 8.5.8 point B above

E. Quick Turn Around Time - PACS or SPIRE need to make an update which affects their parallel mode OD and there is not sufficient time for a redelivery

If the OD has been scheduled by SPIRE and has been delivered to the HSC and there is not sufficient time for SPIRE to redeliver then the "Quick Turn Around" Scenario shall be exercised.

8.7 HSC-ICC Manual Commanding Interactions

8.7.1 Introduction

The ICCs have provided to the MOC a set of MOIS Import files (exported from the cus backend) which have been converted by the MOC to create MOIS procedures which form part of the MOC Flight Operations Plan (FOP).

These procedures are executed "manually" by the MOC in that the uplink of each command, or set of commands, is performed via the MOC SPACON following verbal confirmation from the ICC responsible located at the ICC@MOC (or remotely e.g. during routine operations, at the ICC).

To allow the HSC to be able to generate the manual commanding uplink objects in the DB, before the corresponding TM is downlinked, then the HSC is delivered from the ICC the cus backend + mois export files + tpfs (if applicable).

This section defines how this delivery shall be made.

Configuration Control on the CVS – OD tar files are not ICC specific

On the CVS there is a folder for the commissioning phase which has subfolder per Instrument. Deliveries, and updates to those deliveries, shall be made following an agreed naming convention & data format which is described later in this subsection.

The Commissioning Phase Timeline

Project are responsible for the maintenance & update prior to & during the commissioning phase of the commissioning phase timeline.

This is the prime input to the ICCs in the generation of their Commissioning phase manual commanding deliveries to the MOC and the HSC & the associated updates after that time.

This timeline refers to manual commanding MOC procedures and timeline activities. It is the manual commanding MOC procedures which are addressed in this subsection.

8.7.2 Generating the input tar file for the HSC

(i) Deliveries can be made in two ways
- A full delivery of all cus scripts & calibration tables from a mission configuration.
- A partial delivery containing an update of specific mois, tpf files, or a complete mission configuration

Note : the naming convention of the contents of the delivery shall correspond to the type of delivery being made i.e. Full or Update.

(ii) Deliveries being made by the ICC must always be consistent with the Procedures & Mois export files & TPFs delivered to the MOC.

(iii) The ICC shall export all the definitions and calibration tables (and tags) which are in the mission configuration that they used to generate their Manual commanding mois export files e.g. "pacs_phs_config" from DB in question e.g lab_db@localhost using the command below :
cus -export PACS_CUS_MANCMD_X_Y.defs pacs_phs.defs –exportcaltables PACS_ CUS_CAL_MANCMD_X_Y.xml - config pacs_phs_config -properties hcss.cus.database=lab_db@localhost

NOTE : For the naming conventions being used here, X = version # of a FULL (Complete) delivery, Y = version # of an update to the Full delivery e.g. 3_1 is the 1st update of the 3rd main delivery, 3_0 is a Full delivery.

NOTE : If a cus script or calibration table changes, then a FULL delivery should be made of the mission configuration by the ICC.

(iv) Provision of MOIS Export Files : MOIS Export files delivered should be placed in a tar file which has the following naming convention : PACS_MOIS_MANCMD_X_Y.mois

(v) Provision of Task Parameter Files : TPF files delivered should be placed in a tar file which has the following naming convention : PACS_TPF_MANCMD_X_Y.ipf

(vi) A Readme file is generated as a final file – the contents of the Readme file is described in the next section.

(vii) Tar the following files into a single file
- PACS_CUS_MANCMD_X_Y.def
- PACS_ CUS_CAL_MANCMD_X_Y.xml
- PACS_MOIS_MANCMD_X_Y.mois
- PACS_TPF_MANCMD_X_Y.ipf
- PACS_README_MANCMD_X_Y.txt

The tar file shall have the following naming convention :

For a Full delivery

MANCMD_ ICC_FULL_X_YYYYMMDD.tar

where

ICC = PACS, SPIRE or HIFI
FULL = it is a full (re)delivery for this OD
X = Version number of this FULL delivery (1st delivery = 1, 2nd delivery = 2, etc etc)
YYYYMMDD= year, month & day

For an Update delivery

MANCMD ICC_UPDATE_X_Y_YYMMDD.tar

where
ICC = PACS, SPIRE or HIFI
UPDATE = it is a partial (re)delivery for this OD
X = Version number of the FULL delivery to which an update is being made
Y = Version number of this update (1st update = 1, 2nd update = 2, etc etc)
YYYYMMDD= year, month & day

Example:

SPIRE make a full delivery of their backend for OD60 on the 15th March 09. The filename would be :

MANCMD_ SPIRE_FULL_1_20090315.tar

A few days later (18th March) SPIRE make an update of this delivery with a single mois script changed :

MANCMD_ SPIRE_UPDATE_1_1_20090318.tar

A few days later (19th March) they make another update

MANCMD_ SPIRE_UPDATE_1_2_20090319.tar

(viii) The ICC CCB shall then be held which shall confirm that the delivery can proceed to the HSC.

(ix) The tar file shall be placed on CVS in the following CVS folder & subfolder corresponding to the ICC delivering the file : develop/data/observingmodes/hsc_comm/icc where icc is spire, pacs or hifi

(x) Inform the HSC of the delivery by sending an email to hscops@sciops.esa.int – in this email confirm the CVS version number of the OD tar file that has been placed on CVS.

(xi) The HSC shall respond to the ICC with copy to project & MOC to confirm reception of this delivery.

8.7.3 The contents of the Readme file for the HSC

The Readme file shall consist of the following fields.

1. Date & Time of delivery

2. ICC individual to be contacted where problems arise with the delivery

3. Time range for which the data being delivered is applicable. In this case, reference shall be made to the version number of the commissioning phase timeline used to generate the inputs.

4. Delivery information – names of all files contained in the tar file

5. Cus Script & Calibration files ICC internal configuration control issues
(a) Name of ICC mission configuration from which files were exported (for reference purposes only)
(b) Name of the CVS Tag related to this delivery (if relevant)
(c) Name of the ICC Database containing this delivery (for reference purposes only)
(d) HCSS version used when working with these files

6. AOR File issues – NOT APPLICABLE

7. Spacecraft Database issues
(a) ICC MIB version applicable to these cus & calibration files
(b) HPSDB version (if known) that contains this MIB
(c) OBSM software version on the instrument applicable to this MIB

8. Go-ahead of the ICC CCB (if applicable)

9. SxRs applicable to the updates of the scripts delivered in this release

10. Additional notes

11. CusCmdscript output file (see note below)
(a) Name of CusCmdScript
(b) Expected durations when this is run

8.7.4 Feedback of the testing & implementation of this release to the ICCs

1.Only when this delivery has been fully tested on the test system i.e. import of delivery, creation of mission config, running of the manual commanding import tool, is the delivery accepted.

2. If an error occurs when testing this delivery at the HSC, then the uplink co-ordinator at the HSC shall send an email to the ICC informing them that the delivery has been Rejected and that a redelivery is required.

3. The completion of the test phase shall involve delivery to the Core CCB (cCCB) of a test report by the uplink validation co-ordinator.

4. Go-ahead to install this mission configuration on the Operational System shall be given by the Core CCB.

5. Once installation is completed then the manual commanding .txt file shal be prepared with the associated mois & TPF files such that, when the activities are performed then this can be updated with OBSID, TC history information.

8.8 Special deliveries from HIFI : Sequencer & HSpot Cal table

8.8.1 Introduction

There are two types of deliveries being made from HIFI to the HSC which affect the HSpot & its front end. These are Sequencer deliveries and configuration files deliveries.

8.8.2 Sequencer deliveries from HIFI to the HSC

These shall be informed to the HSC via an email sent to randres@sciops.esa.int with hscops@sciops.esa.int in copy. Details as to the major changes made to the sequencer since the last release e.g. SxRs, should be defined in this email.

Their location on the CVS is :

Herschel_CVS] / develop / data / observingmodes / hifi / spot2cus / herschel / phs / server / interaction / hifi

8.8.3 HSpot Configuration table deliveries from HIFI to the HSC

During the resolution of the SPR [PHS-1115] Wrong DBS overlay after CUS script change, it was detected the need of include a new configuration file in the server part of PHS (To be deployed in the JBoss instances). The new file is used to obtain the distance between a pointing position and the chopped one in order to generate the shapes of the HIFI DBS pointing observations in HSpot (In previous version the value was hardcoded). The change only affects to the graphical AOR overlay.

There are two new properties associated to the change that must be included in the properties file of the JBoss servers:

- hcss.phs.skychopthrowfile: that specifies the exact name of the file.
- hcss.phs.skychopthrowdir: that specifies the absolute path of the directory that contains the file.

The file should be provided by HIFI where its contents has been changed with a list of SxRs contained in an email informing of its delivery (on the CVS) and reasons for changes to the file.

At present the source file can be found at develop/data/observingmodes/hifi/calibrationfiles/skychopthrow in the CVS system.

8.9 CUS Script Naming Convention Rules & link to the HSA

8.9.1 Introduction

All calibration & engineering observations which are planned on board the spacecraft end up having their data placed in the Herschel Science Archive. They must however be clearly recognisable as being either Calibration or Engineering Observation in their CUSMODE name.

The CUSMODE Name is in fact the same name used in the ICC high level cus scripts. Details of the conventions being applied are in section 8.8.2.

For the standard AOTs, the conversion being done at the level of the DP SPG framework to extract their attributes from the Operational DB and put their names in the Product metadata consistent with the Product Definition Group, is also addressed in this section i.e. 8.8.3

8.9.2 CUS Script Naming Conventions

The HSC has passed to the HSA group the following names :

(a) PACS

- PacsEng
- PacsCal

(b) HIFI

- HifiEng
- HifiCal
- HifiManCmd

(c) SPIRE

- SpireEng
- SpirePhoto_Cal
- SpireSpectro_Cal

The above have now been implemented by the archive team within the HSA to allow this recognition to be possible

The ICCs must ensure that current & future high level cus scripts which are called by Expert HSpot to create these observations ALWAYS follow the naming convention above.

Please be aware that deviations from the above could mean that the observations will not be recognised as calibration/engineering observations and might either (a) not be placed in the archive or (b) be placed in the archive and be considered a normal scientific observation.

8.9.3 List of Standard AOTs & their naming conventions in Product Metadata

HCSS SCR 6468 contains the mapping that has been implemented between the identification of the standard AOTs in the Versant DB and their naming in the product metadata.

Rather than listing this mapping, the reader is recommended to read directly this SCR & its analysis.

SCR-6468 List of observing modes that should appear as product metadata

9. Instrument Specific Operational Interactions

9.1 Instrument Anomalies & Notification of Problems

9.1.1 Type of Instrument Anomalies that can arise

This subsection shall try to list anomalies that could occur from the level of minor through to major. *In future drafts of this document, it would be expected that this list will expand. I would expect that the wording will be updated also.*

Background to the identification of an anomaly

The identification of an anomaly is primarily derived from the operator being informed of (or a software process reacting to), in some way, a change in the nominal operational status of the instrument. Changes can be flagged primarily through :

(a) The hitting of Soft & Hard Limits
(b) The generation of Instrument Event Packets
(c) The reaction of the FDIR to an event

(a) Soft & Hard Limits

Soft Limits are values set in the (MOC) Downlink MIB tables that provide a lower & upper limit which if reached e.g. for a voltage, are considered to be acceptable but important to be aware that they have been hit. These could be considered to be information messages rather than warning messages.

Hard limits are considered to be lower & upper limits which if reached are considered to be a warning that the values in question are hitting what is considered to be a boundary outside of which problems could arise with the instrument.

At the MOC, when an out of limit is generated, be it soft or hard, then an alarm is raised for the Spacecraft Controller (SPACON) to acknowledge, and react as defined by the procedure delivered to him/her from the ICCs.

Access to this limit data is provided through the Out of Limit Data sets which are retrieved by the HSC from the MOC DDS, imported into the HSC DB and propagated to the ICCs.

(b) Instrument Event Packets

All instruments have the capability to generate event packets. Such event packets can be generated for information purposes, as warnings or indeed as statements of a course of action having been performed by the instrument to deal with an anomaly.

These events are stored in the relevant Packet Store in the SSMM which, at start of DTCP, is dumped.

ESOC have been provided with a procedure from each ICC which describes the course of action the Flight Control Team must take whereby a certain event is generated by the instrument. In general, this action will be to inform the HSC & the ICC of the error in question.

Access to these event packets is provided through the Spacecraft & Instrument HK dump data which are retrieved by the HSC from the MOC DDS, imported into the HSC DB and propagated to the ICCs.

(c) Failure Detection Isolation & Recovery (FDIR)

All instruments (and the Spacecraft service module) have an FDIR implemented in their software which continuously monitors the status of the subsystems belonging to that instrument and which, where an anomaly event packet is generated, may react to carry out a predefined course of action e.g. reconfigure to backup, switch to safe mode, switch off etc.

As the Spacecraft & the instruments are out of contact for 21 hours per day then the use of FDIR forms an important part of the autonomy process that each instrument must follow during the operational phases of the mission. It represents a safeguard in ensuring the safety of the instruments at all times during the operational day.

The types of anomalies that can be encountered

(a) Instrument Minor Anomalies

Minor anomalies can be considered to be those which hit soft limits or result in a behaviour which is expected or, if unexpected, considered to be acceptable from the perspective that the instrument proceeds with the nominally scheduled observation timeline.

There shall be little to no impact on the scientific operations of the instrument for the case of minor anomalies. The impact shall be such that no change to the planning of observations for that particular instrument shall be required.

The hitting of hard limits whereby it is a once off explained event is also considered to be a minor anomaly.

It is to be expected that the post-processing of the data from the instrument at the ICCs will raise a large number of such minor anomalies throughout the mission.

The running of the Quality Control Pipeline at the HSC may also result in the discovery of such minor anomalies.

(b) Instrument Major Anomalies

Major Anomalies can be those which

(i) Hit hard limits and which result in the instrument performing an FDIR to reconfigure or switch down the instrument
(ii) Involve the instrument being commanded to a safe mode condition
(iii) The instrument science being affected in a manner in which scheduled observations for that same instrument need to be altered

It is expected that most if not all anomalies in the major category shall result in an event being generated by the instrument to be downloaded at DTCP in the Critical Event Log dump.

It is expected that all major anomalies will be responded to by the instrument FDIR software to ensure & guarantee the safety of that instrument.

While post-processing of the downlink data is expected to highlight only minor anomalies, the identification of an anomaly whereby the instrument scientific output is suspect or tainted, will lead to the generation of an instrument major anomaly investigation being opened.

(c) Spacecraft Anomalies

As a final point to note, the switching off of instruments can occur not only from the instrument itself recognising a problem but also because the spacecraft platform has a problem which leads to a safe mode being triggered.

Such anomalies should be considered to be rare but as they result in lost science time then they fall into the major anomaly category.

9.1.2 Notification of Problems between HSC & ICC

Email to be used for notification of all instrument anomalies

The HSC shall be informed (or shall inform the ICCs, MOC) of such problems via the email address : hscops@sciops.esa.int

The Email addresses for notification of instrument anomalies at the ICCs shall be :

HIFI_ICC <hifi-operations@sron.nl>,

PACS_ICC <pacs_ops@sciops.esa.int>

SPIRE_ICC <Spire@stfc.ac.uk>

Major Anomalies

Major anomalies as have been described in section 8.1.1 above will fall primarily into the reaction defined in section 8.1.3 because it is expected that MOC will be informing the HSC & the ICCs of their occurrence.

Where post-processing of data does lead to a major anomaly being found then these shall be immediately informed by the ICC (or HSC) via the email addresses provided above. A phone call shall also be made to follow up on this email to ensure that it has been received.

In all cases the description of the anomaly shall define the immediate course of action to be taken, if any, at a mission planning level, the implications on future planning cycles as well as implications on the downlink data processing side.

Minor Anomalies

Where post-processing of data does lead to a minor anomaly being found then these shall be informed by the ICC (or HSC) via the email addresses provided.

How problems identified in the Quality Control Pipeline are followed up is recorded in section 5.2.

Recording of Instrument Anomalies

All major instrument anomalies shall be recorded in the ESOC ARTS System. See next section for details.

The raising of an Anomaly Report in ARTS shall be performed by the centre who has encountered the problem.

The generation of an anomaly report for a minor anomaly will be dealt with on a case by case basis and shall fall under the responsibility of the Core CCB to decide how they should be best addressed.

9.1.3 Notification of Problems between the MOC and the SGS

It is assumed that the MOC Flight Control Team will contact a representative of the HSC & ICCs via telephone or e-mail within one hour of detection of a problem (instrument malfunction, operational problem), with the communication method dependent on the time and severity of the problem

Examples of instrument malfunctions and operations problems include, but are not limited to:

- One or more instruments in Safe Mode
- Communications failure between MOC and Ground Station
- Spacecraft malfunctions affecting the instruments

The MOC shall send an email to the four email addresses provided in Section 8.1.2.

Note that during operations the anomaly reports affecting instruments will be available on line (URL: http://artse.esoc.esa.int) as soon as they are registered in the database by the FCT. Nominally they will be recorded in the ARTS system on the same day as they have been reported.

The anomaly reports affecting the ground interface between MOC and SGS (and their documentation) will be available on line (URL: http://artse.esoc.esa.int) as soon as they are registered in the database for ground anomalies by the FCT.

The anomaly reports will include all attachments deemed useful to describe the symptoms of the malfunction.

The login details to the ESOC ARTS system have been sent directly to each of the centres.

For the case of lower level Instrument anomalies e.g. TC failures, OOLs, it has been agreed that these shall be recorded not as Anomaly Reports but as SPRs in the ICC JIRA SxR systems. They shall be raised by HSC.

9.2 OBSM Interactions

9.2.1 Relevant Documentation

[OBS-1] SCOS-2000 OBSM External Interfaces Control Document, Issue 1.3, 11-Jul-01, S2K-MCS-ICD-0014-TOS-GCI, by SCOS-2000 Team

[OBS-2] OBSM Import Image File naming convention, Version 2, 28-Feb-08, by Liviu Stefanov

9.2.2 OBSM Image delivery to HSC – the process involved

OBSM Image Update Rules

The following rules shall be followed by each ICC for the delivery of their OBSM images to the HSC.

(a) Updates to the On Board Software of an instrument shall be planned well in advance with both the HSC & MOC fully aware of the implications on the uplink & downlink of the software change. As a result, it is expected that during routine operations, the ICC in question shall have raised this issue in the Ground Segment Operations telecon/meeting which is to be held monthly

(b) It is expected that before any update to the software is made, a full test campaign will have been run at the ICC site on a representative copy of the instrument (whether simulator or flight spare) in order to validate the changes being made.

(c) All images being delivered to HSC shall be in the format defined in [OBS-1] and following the filenaming convention described in [OBS-2]

(d) All images being delivered to the HSC shall be under configuration control e.g. CVS, at the ICCs

(e) The delivery of an OBSM image file(s) to the HSC shall be as .IMG files consistent with the naming convention in [OBS-2]

(f) Delivery of an OBSM Image file shall be made to the HSC FTP Operational Server which is only accessible via the lease lines existing between the HSC and each of the ICCs.

(g) The delivery shall be made to the following directory on the HSC FTP Operational server : /home/hsc_icc/fromICCs/obsm/obsm_xxxx/ whereby xxxx corresponds to pacs, spire or hifi
- DPU_OBSW_User_Manual.pdf
- PADPRMDA_0000_0000904_REF_2009_159T102051.zip
- PADPRMPR_0000_0000904_REF_2009_159T102051.zip
- README_CCB_PADPRMPR_0000_0000904_REF_2009_159T102051.txt
- Release_Notes.pdf

(h) Delivery of an OBSM Image file shall be followed by an email sent to hscops@sciops.esa.int & cCCB@sciops.esa.int. This email shall contain :

(i) The readme file delivered by the ICC OBSW provider (This release note would nominally contain the list of SxRs and modifications related to this update). This readme file shall be the same name as the Image file but with README_ beforehand
(j) A readme file containing the delivery information described on the next page. This readme file shall be the same name as the Image file but with README_CCB_ beforehand

(i) The HSC may proceed to forward the images to the MOC to allow them to pre-process them and verify their correctness.

OBSM Image updates – MOC interactions

(a) Before delivery of an OBSM image is to be made to the HSC, a CCB shall have been run at the ICC to confirm that the image in question has been successfully tested and to complete the README_CCB_Imagefilename.txt Readme file as described below.

(b) It is the MOC responsibility to iterate with the relevant ICC on the procedures for upload of this image to the instrument + other operational issues which need to be addressed related to this interaction.

README_CCB_Imagefilename.txt – Delivery Note Contents

1. Date & Time of delivery

2. ICC individual to be contacted where problems arise with the delivery

3. Delivery information – names of all files contained in the zip file

4. What is the Instrument Subsystem software that is being updated.

5. What is the current version of that instrument subsystem software on board.

6. Spacecraft Database Issues
   (f) Is a new MIB to be used once this image becomes active on board
   (g) If yes – what is that MIB version & what is the HPSDB version (if known) that contains this MIB

7. Implications on the Uplink
   (h) When this image becomes active on board, will a new version of the Cus/Calibration tables be required to be used.
   (i) If Yes, please specify the delivery information of this new version to HSC
   (j) What AOTs are affected by this software update if any?

8. Implications on the Downlink
   (a) When this image becomes active on board, is a change required to the downlink calibration products?
   (b) If Yes, please specify the delivery information of this new version to HSC
   (c) What pipelines, if any, are affected by this new software update?

9. Go-ahead of the ICC CCB

10. Additional notes

9.2.3 OBSM Image dump file delivery to ICCs – the process involved

Activation of the new Image on-board

Following a pre-agreed timeline, MOC shall uplink the image onto the instrument. Activation of the new image shall then take place again according to the pre-agreed timeline.

Delivery of image dumps to HSC and on to the ICCs

All Image dumps shall be sent in two ways to the HSC from the MOC.

(a) As OBSM Image files via the File Transfer System
(b) As OBSM Image dump packets via the DDS

The OBSM Image dump files sent via the File Transfer System shall be placed by the HSC onto the HSC FTP Operational Server in the following directory : /home/hsc_icc/toICCs/obsm/obsm_xxxx/ where xxxx corresponds to the ICC in question i.e. pacs, spire, hifi.

An email shall be sent to the ICCs to confirm delivery of the image dump file. The Email addresses to be used are :

HIFI_ICC <hifi-operations@sron.nl>,

PACS_ICC <pacs_ops@sciops.esa.int>

SPIRE_ICC <Spire@stfc.ac.uk>

The data sent from the DDS shall be propagated to the ICCs as part of the nightly propagation process.

9.3 MIB & HPSDB Interactions

The approach on how new MIBs are fed to MOC during operations and how the merged HPSDB is fed back through the HSC to the ICCs is described here.

It should be noted that MOC are currently in the process of finalising a Technical Note that defines how this interaction shall work. When this TN becomes available then this section shall be completed in more detail.

9.3.1 Relevant Documentation

[MIB-1] SCOS-2000 database import ICD, Issue 5.2

[MIB-2] H/P naming convention specification, Issue 2.2

[MIB-3] HCSS MIB clarification and tailoring note, Issue 1.9

[MIB-4] HPCCS External ICD issue 1.8

9.3.2 MIB delivery from the ICCs to MOC – the process involved

Delivery Mechanism

The delivery mechanism for the MIBs to be provided to the MOC shall be via email. The HSC shall be placed in copy of this email.

The MIB delivery should be accompanied by a delivery note defining what are the differences between this MIB version and the last version delivered by the ICC.

Details shall also be provided as to when this MIB should become “live” in the uplink/downlink chains of the ground segment.

9.3.3 HPSDB file delivery to ICCs – the process involved

As the HSC receives a single tar file containing the HPSDB (which includes the 3 merged instrument MIBs) from the MOC during operations then this file will be copied to the HSC FTP Operational directory for access by the ICCs.

The directory is as follows : /home/hsc_icc/toICCs/mib

An email shall then be sent to a specific distribution which shall inform of the availability of a new HPSDB for download from this location.

Distribution List

The distribution list is as follows :

HSC : hscops@sciops.esa.int, hscics@sciops.esa.int, hsccsg@sciops.esa.int, Johannes.Riedinger@esa.int, Paul.Balm@esa.int, Daniel.Galan@esa.int,

HIFI : P.R.Roelfsema@sron.nl, David.Teyssier@esa.int, **Peer Zaal peer@sron.nl,** Albrecht de Jonge <A.R.W.de.Jonge@sron.nl>,

PACS : Bart.vandenbussche@ster.kuleuven.be, ohb@mpe.mpg.de, fgb@mpe.mpg.de, Erich Wiezorrek erw@mpe.mpg.de, rik@ster.kuleuven.be,

SPIRE : Spire Operations Centre" <Spire@stfc.ac.uk>,

Others : mpsphsccb@sciops.esa.int, herdp_ta@sciops.esa.int

Typical Email To Be Sent

Here is an example of a typical Email being sent :
==========
Dear all,

A HPSDB was delivered to us from the MOC that contains the three instrument merged MIBs. The MIBs in that delivery are as follows :

For Herschel Model including the following software:
· CDMS 3.6.2
· ACMS 4.0
· PACS Mib version 9.3
· HIFI Mib version 11.10
· SPIRE Mib version 3.0.B1 PR

The File placed on the FTP operational server is FTS--200811281500--DB--HERSCHEL.zip

It is located in the standard mib delivery directory namely : /home/hsc_icc/toICCs/mib
==========

9.4 SIAM file Interactions

The approach on how new SIAMs are generated, used by the Mission Planning System and fed to MOC during operations is described here.

9.4.1 Relevant Documentation

[SIAM-1] Inputs & Interfaces to the SIAM, Issue 1.2, 9th Dec 08

[SIAM-2] Herschel Spacecraft/Instrument Alignment History, PT-HMOC-ICD-21111-OPS-GFT, v1.3 (07/02/06)

9.4.2 SIAM updates from the ICCs to HSC – the process involved

Chapter 6 of [SIAM-1] describes what updates are expected to be provided by the ICCs to the HSC.

Chapter 7.1 of [SIAM-1] fully describes how deliveries of updates shall be made from the ICCs to the HSC.

As the document defines in greater detail exactly what updates should be provided, in what format, then this shall not be repeated here.

The Master document for this interface is therefore [SIAM-1]

9.4.3 SIAM file deliveries from the HSC to ICC – the process involved

Chapter 7.2 of [SIAM-1] fully describes how the SIAM file is to be delivered from the HSC to the ICC.

As this delivery mechanism is the same as for all other MPS specific files then the steps are repeated below for reference :

It is assumed that the SIAM file change has been approved at the core CCB.

1. Access to the operational ftp server **herfts02.esac.esa.int** using the **hsc_icc** account.

2. Go to the output data directory:
cd /home/hsc_icc/toICCs/mps/siam

3. Upload the SIAM file: put mmmm_nnnn.SIAM
where mmmm corresponds to the operational day (OD) and nnnn is a version number starting at 0001 (see [SIAM-2]).

4. Notify to the PHS/MPS CCB, Instruments' Calibrations Scientists (ICS) Team at HSC and Herschel Pointing Working Group: send an e-mail to mpsphsccb@sciops.esa.int, hscics@sciops.esa.int, CC to hpointwg@sciops.esa.int with the following subject: "New SIAM file delivered: mmmm_nnnn.SIAM". No body text is required.

9.5 Instrument HK Interactions where propagation is down

This section defines the mechanism to deal with the possibility whereby an ICC is faced with a double failure scenario i.e. instrument error + propagation failure, and an ICC operations representative wishes to perform a review Instrument HK data contents of the last OD to check their instrument health status.

The mechanism is as follows : In the event that propagation is down and there is an instrument issue whereby an ICC wishes to look at the instrument Health Status during the course of the last OD, then the ICC can create an empty DB and through the use of TM ingestion place the HK TLM files (made available daily on HSC FTP site) into that DB. The ICC can then access this DB via its standard DB query/QLA mechanisms as described later in this email.

9.5.1 Relevant Documentation

[INST_HK] All ICDs relevant to the Instrument HK can be found in the Ground Segment ICD Wiki page

http://www.herschel.be/twiki/bin/view/HSC/GroundSegmentInterfaces

[SC_HK] All ICDs relevant to the S/C HK can be found in the Ground Segment ICD Wiki page

http://www.herschel.be/twiki/bin/view/HSC/GroundSegmentInterfaces

9.5.2 ICC Ingestion of HK data into empty DB to review instrument HK status

The following steps shall be followed by the ICC.

1. Copy from the HSC FTP Ops server onto your server the HK files you wish to ingest into your DB.

The files are located on this server in /home/hsc_icc/toICCs/hktm and then in that directory you have four subdirectories - one per instrument + one for S/C HK.

Each ICC should set up via rsynch the capability to retrieve these files as they are placed on this server

2. Create an empty DB using the db_admin tool and assign permissions to the user who will run the tmingestion.

3. Update the Properties file in Appendix 1 (**OPS_HCSS_TM_INGEST.props)** with

(a) Name of the DB & server where it is located - here is the property referred to in that file - **hcss.tmingest.database= DBNAME@DBSERVER**

and

(b) the directory where you will place your .TLM files - here is the property referred to in that file - **var.tmingest.dir = /home/YOUR_TLM_INPUT_FOLDER**

4. Place all your .TLM files into the directory referred to in point 3(b)

5. Update the Environment Setup file in Appendix 2 (OPS_setHcssEnvironmentTmIngest) to point to your properties file **OPS_HCSS_TM_INGEST.props** and your HCSS software path and your Versant_Root.

6. If you are ready to perform the TLM ingestion into your DB then proceed with the steps below :

(a) On your workstation execute:
> source OPS_setHcssEnvironmentTmIngest

(b) Run the process (ignoring all SIGHUP signals, to avoid quitting when the terminal is closed):
> tmingestion -missing -cache < /dev/null &

Note : you should see each .TLM file being ingested successfully (the files are moved to a processed subfolder)

(c) Logs will be generated wherever your configuration is pointing to (userlogging.properties file)

7. To Stop it - Kill whatevers processes have been started

8. Review the data contents through the standard interfaces available in your ICC. I attach below the emails sent to me by various calibration scientists at the HSC who have performed analysis on such a DB. Annex 1 for HIFI, Annex 2 for PACS & Annex 3 for SPIRE.

ANNEX 1 - DATA REVIEW APPROACH FOR HIFI

Anthony Marston <tmarston@sciops.esa.int>	To	"Larry O'Rourke" <Laurence.O'Rourke@esa.int>
	cc	David Teyssier <David.Teyssier@sciops.esa.int>
26/11/2009 16:37	Subject	Test of data extraction from backup HK database -- success!

Hi Larry,
The database test_hk_data@herdb01 can indeed be accessed.
But it can only be accessed by timestamp NOT obsid. I attach a short
script that can do this.
Cheers
Tony

Anthony Marston
Herschel Instrument and Calibration Scientist Group Lead,
Herschel Science Centre,
European Space Astronomy Centre, SCI-SDH,
P.O.Box 78, 28691 Villanueva de la Canada (Madrid), SPAIN
tel: +34 91 813 1370
fax: +34 91 813 1218

```
from java.text import SimpleDateFormat
from herschel.share.fltdyn.time import FineTime

def ftdates(startdate,enddate):
  formatter = SimpleDateFormat ("yyyy-MM-dd HH:mm:ss")
  date1 =  formatter.parse(endDate)
  date2 =  formatter.parse(startDate)
  stime = FineTime(date2)
  etime = FineTime(date1)
  return stime,etime

startDate = "2009-06-23 06:44:01"
endDate = "2009-06-23 06:46:01"
stime,etime=ftdates(startDate,endDate)

# the following uses a test HK database.
out=AccessPacketTask()(apid=1026, db="test_hk_data@herdb01.esac.esa.int 0 READ", start=stime, end =
etime)
arrList = java.util.ArrayList()
for x in range(len(out)):
   arrList.add(out[x])

pseq = PacketSequence(arrList)
print pseq
```

```
# should print out recognised packets if hifi calibration tree in configuration.
# the below bit is NOT working. Can not do this by obsid.
obsid =  1342178917L
out1=AccessPacketTask()(apid=1026, db="test_hk_data@herdb01.esac.esa.int 0 READ", obsid=obsid)
arrList1 = java.util.ArrayList()
for x in range(len(out1)):
   arrList1.add(out1[x])

pseq1 = PacketSequence(arrList1)
print pseq1
```

ANNEX 2 - DATA REVIEW APPROACH FOR PACS

Roland Vavrek <Roland.Vavrek@sciops.esa.int>

04/11/2009 10:36

To: Laurence.O'Rourke@esa.int

cc: baltieri@sciops.esa.int, Ivan.Valtchanov@sciops.esa.int, David.Teyssier@sciops.esa.int, Anthony.Marston@sciops.esa.int, leo.metcalfe@sciops.esa.int, antonio.villacorta@sciops.esa.int, Paolo Pesciullesi <Paolo.Pesciullesi@sciops.esa.int>

Subject: Re: Verification that you can see the Instrument HK ingested into an Empty DB (HSC propagation down scenario)

Hi Larry,

The test was very simple but if this is all what you need, I can confirm for OD40 in the time period "2009-06-22 0:00:00" to "2009-06-23 0:00:00" browsing APID 1152 I get the following sequence:

PacketSequence class version $Revision: 1.67 $
PacketSequence contains 1389 packets.
The 3 different packet types contained are:
PACS_ESSENTIAL_HK_N (1375 packets), (apid, type, subType = 1152, 3, 25), instrument = PACS
PACS_LINK_CONNECTION_N (1 packets), (apid, type, subType = 1152, 17, 2), instrument = PACS
PACS_TC_ACP_OK_N (13 packets), (apid, type, subType = 1152, 1, 1), instrument = PACS

This is correct regarding the instrument activity for the referred period.

Other testers I recommend you ask Paolo for read access to the DB instead of using the "hsc" uname.

Cheers,
Roland

ANNEX 3 - DATA REVIEW APPROACH FOR SPIRE

Ivan Valtchanov <Ivan.Valtchanov@sciops.esa.int>

05/11/2009 15:58

To Antonio Villacorta <Antonio.Villacorta@sciops.esa.int>

cc Laurence.O'Rourke@esa.int, Roland Vavrek <Roland.Vavrek@sciops.esa.int>, baltieri@sciops.esa.int, David Teyssier <David.Teyssier@sciops.esa.int>, Anthony Marston <Anthony.Marston@sciops.esa.int>, Leo Metcalfe <leo.metcalfe@sciops.esa.int>, Paolo Pesciullesi <Paolo.Pesciullesi@sciops.esa.int>, Luca Conversi <Luca.Conversi@sciops.esa.int>

Subject Re: Verification that you can see the Instrument HK ingested into an Empty DB (HSC propagation down scenario)

Hola Antonio,

Now it does not report any missing packets! And indeed, the health monitoring works using the previous day last packet time in order to check the gaps.

So, the test was really very helpful exercise, now I am confident that we can un SPIRE health checks from here.

Cheers,
Ivan

On 5 Nov 2009, at 15:44, Antonio Villacorta wrote:

Hola Ivan,

Having run our gap checker tool, I cannot see any missing packets for the period you mention:

```
[hsc@herdb02 ~/hdbinspector]$ ./hdbinspector_test.sh
05-Nov-09 14:56:40.919 INFO ReplStoreFactoryImpl: Creating optimistic no-lock ObjectStore:
test_hk_data@herdb01.esac.esa.int
Accessing data.. please wait -
-- TM GAPS  APID INSPECTOR --

Processing all data that match the following constraints:
From    : 22-06-2009 18:00:00
Up to   : 22-06-2009 19:00:00
```

However, when I re-checked the files that I ingested I can see that for APID 1280 the file processed was:
1280_2009-06-22T18:10:00.000Z_2009-06-23T14:50:00.000Z_124.TLM

So indeed some packets on 2009-06-22 from 18:03 to 18:09 are not there, but in the file belonging to the day before (OD39, not ingested):
1280_2009-06-21T14:40:00.000Z_2009-06-22T18:10:00.000Z_165.TLM

I've just ingested this file in our test DB, please re-run your tools and let me know if we've got the missing packets. Sorry for the inconvenience.

Cheers...

Ivan Valtchanov wrote:
Hi Larry,

I have mirrored the full SPIRE health monitoring and trend analysis operational setup, currently only in my account but I am thinking of making it available site wide. And I need to write some notes on how to use it. It's straightforward with a GUI and really easy. So, here is the result for OD0040 from test_hk_data@herdb01 that I performed today:

1. The Health monitoring summary:

#
/home/ivaltchanov/SPIRE/Healthmon/logs/OD_0040/SpireOps_HealthMon_Summary_OD0040_220609_v1.txt
Observational day: 40
22-06-2009 18:03:09 UTC
to
23-06-2009 14:45:01 UTC
log processed on 05-11-2009 11:21:05 UTC
#
Database = test_hk_data@herdb01.esac.esa.int
#
Health Monitoring Summary

**** Event Packet Summary ****
Events (excl STEPs): 0
Exceptions: 0
Alarms: 0

**** Telecommand Summary ****
TC Acceptance failures: 0
TC Execution failures: 0

**** Transparent Packet Summary ****
Number of Transparent Packets received: 0

**** Missing Packet Summary ****
Nominal Housekeeping Packets = 0 of 18628
Critical Packets = 187 of 37134
Photometer Science Data = 0 of 0

Spectrometer Science Data = 0 of 0
Subsystem Science Data = 0 of 0

**** Redundant Event Packet Summary ****
Events (excl STEPs): 0
Exceptions: 0
Alarms: 0

**** Redundant Telecommand Summary ****
TC Acceptance failures: 0
TC Execution failures: 0

**** Redundant Missing Packet Summary ****
Nominal Housekeeping Packets = 0 of 0
Critical Packets = 0 of 0
Photometer Science Data = 0 of 0
Spectrometer Science Data = 0 of 0
Subsystem Science Data = 0 of 0

Now I see some missing CHK packets. Then I check the corresponding file for gaps:

#
/home/ivaltchanov/SPIRE/Healthmon/logs/OD_0040/SpireOps_HealthMon_CHK_Gaps_OD0040_220609_v1.txt
Observational day: 40
22-06-2009 18:03:09 UTC
to
23-06-2009 14:45:01 UTC
log processed on 05-11-2009 11:20:46 UTC
#
Database = test_hk_data@herdb01.esac.esa.int
#
GAP 22-06-2009 18:03:08 UTC 22-06-2009 18:09:24 UTC 7181 7367 187

And then I can compare this gap with the gap checker from HSC and proceed further to find out whay there are missing packets.

I hope this is what you need?

Cheers,
Ivan

10. Operational data transfer Interactions

10.1 The Operational Lease Lines

10.1.1 Relevant Documentation

[LL-1] Communications RRF Report, Issue 1.0, HERSCHEL/HSC/REP/0695

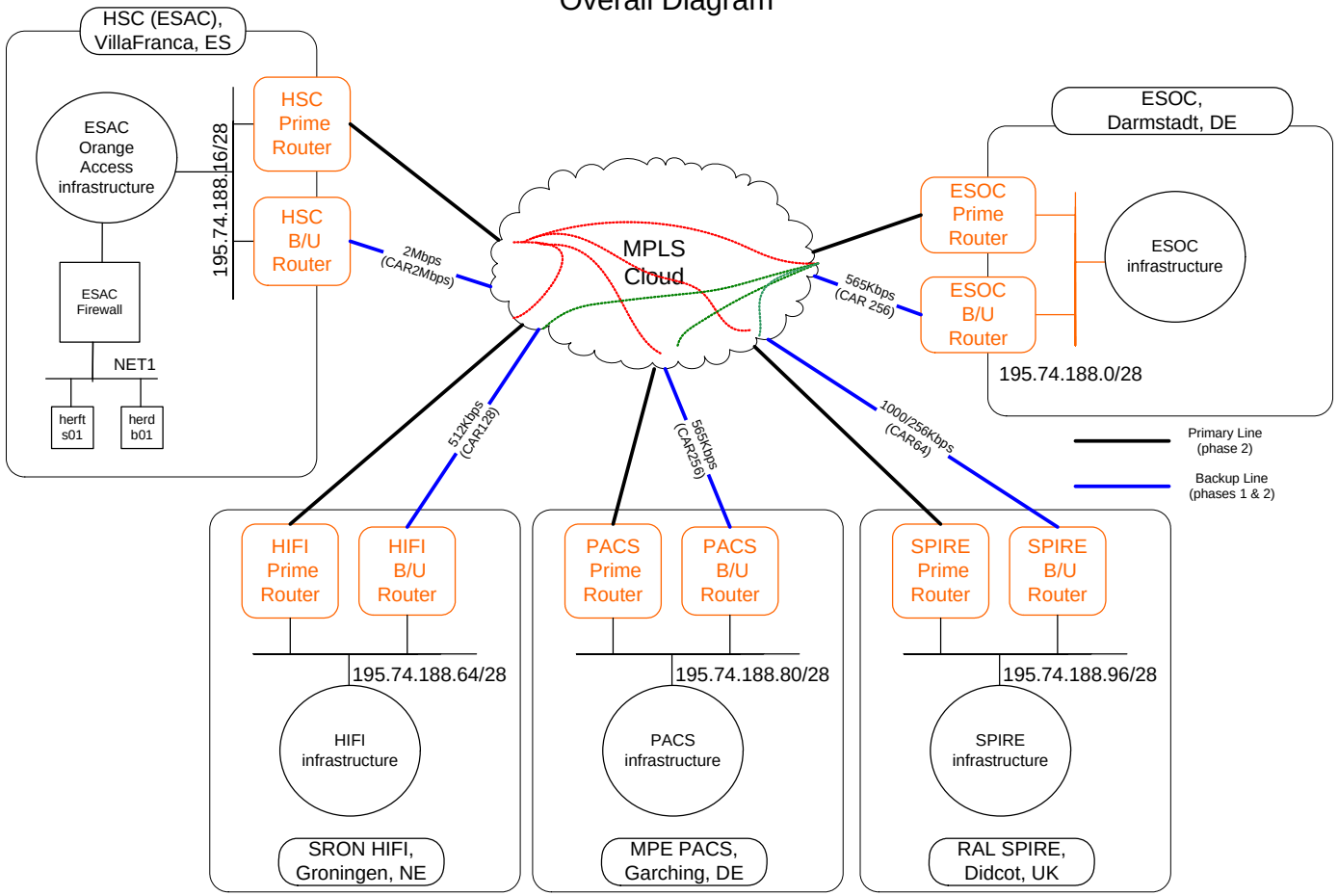
10.1.2 The Lease line Intended implementation – MPLS cloud

The lease lines between the HSC & MOC & between the HSC & the ICCs are shown in diagrammatical form on the next page. This is known as the MPLS cloud.

The lease lines between the HSC & MOC during operations shall be 512kbps prime & redundant.

The lease lines between the HSC & each of the ICCs during operations are defined to be 2Mbps prime & 512kps redundant.

Herschel Science Ground Segment Overall Diagram



10.2 The actual final implementation

The implemention of these lines has resulted in the following

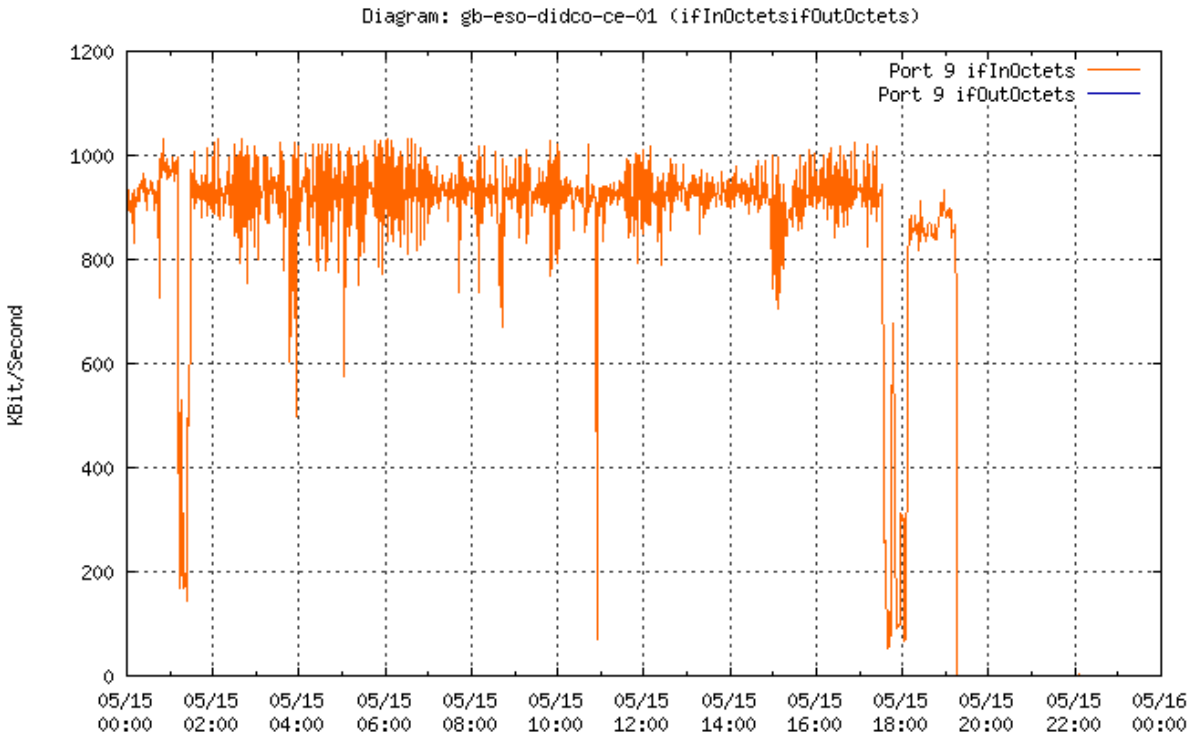
- SPIRE (RAL) bandwidth is 100KB/s
- HIFI bandwidth is 60KB/s.
- PACS bandwidth is 60KB/s.

Explanation: RAL got initially an A-DSL line of 1024 Kbps (as the std. solution for other sites was 512 S-DSL). After Phase-2, all sites got a leased line of 2Mbps (with CAR 512Kbps) meaning effective rate of 512Kbps. However, the A-DSL of RAL performs better than the Leased line in the downstream direction (ESAC -> RAL), therefore the network automatically selects this path, giving RAL an extra BW. You can see this asymmetry from the two RAL graphs below.

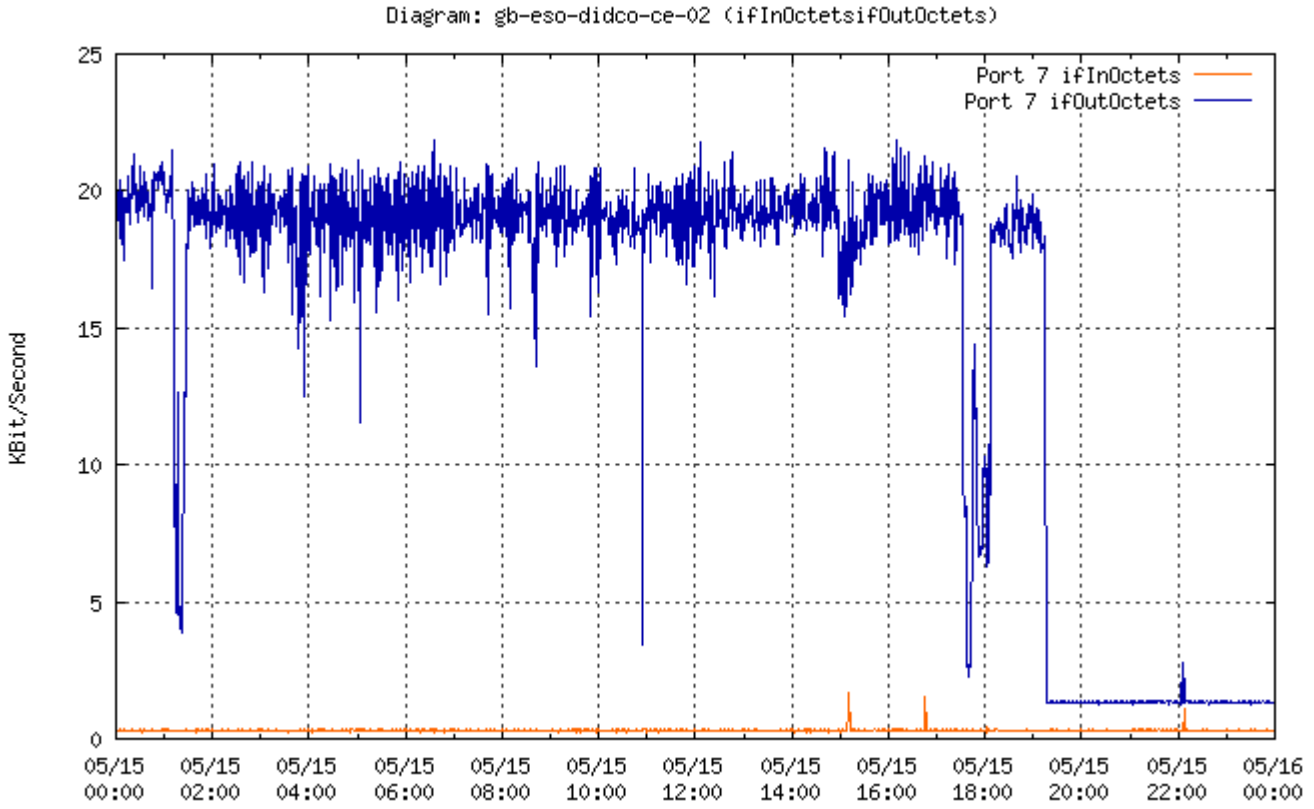
Should the DSL fail, then the automatic fail-over to the leased line will put the BW for RAL in line with the other sites. We detected this "difference" already on previous SVT-S and decided to leave it like that so RAL could benefit from the extra BW.

Note1: the A-DSL features 1024 Kbps downlink, and only 64 Kbps uplink, so when RAL uploads data to ESAC, it uses actually again the best path, in this case the 512kbps provided by the leased line.
Note2: you refer to speed transfers in Kbyte/s, while I refer the line speed in Kbit/s, so all speeds need to be adjusted by a factor of 8 (plus some overhead).

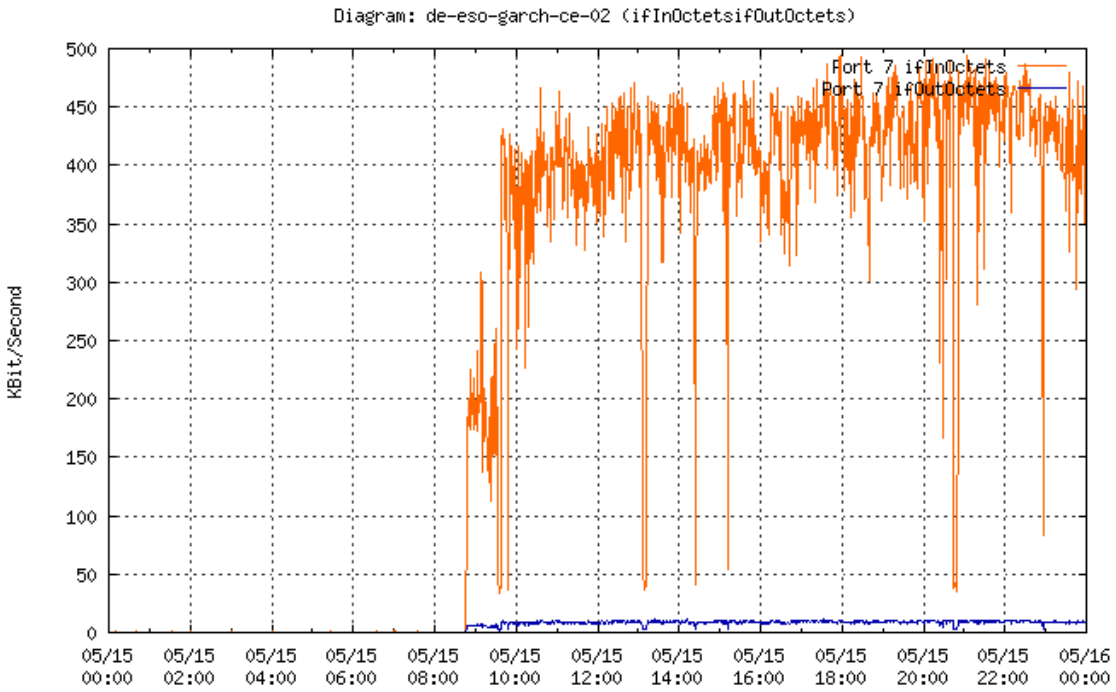
RAL A-DSL line :



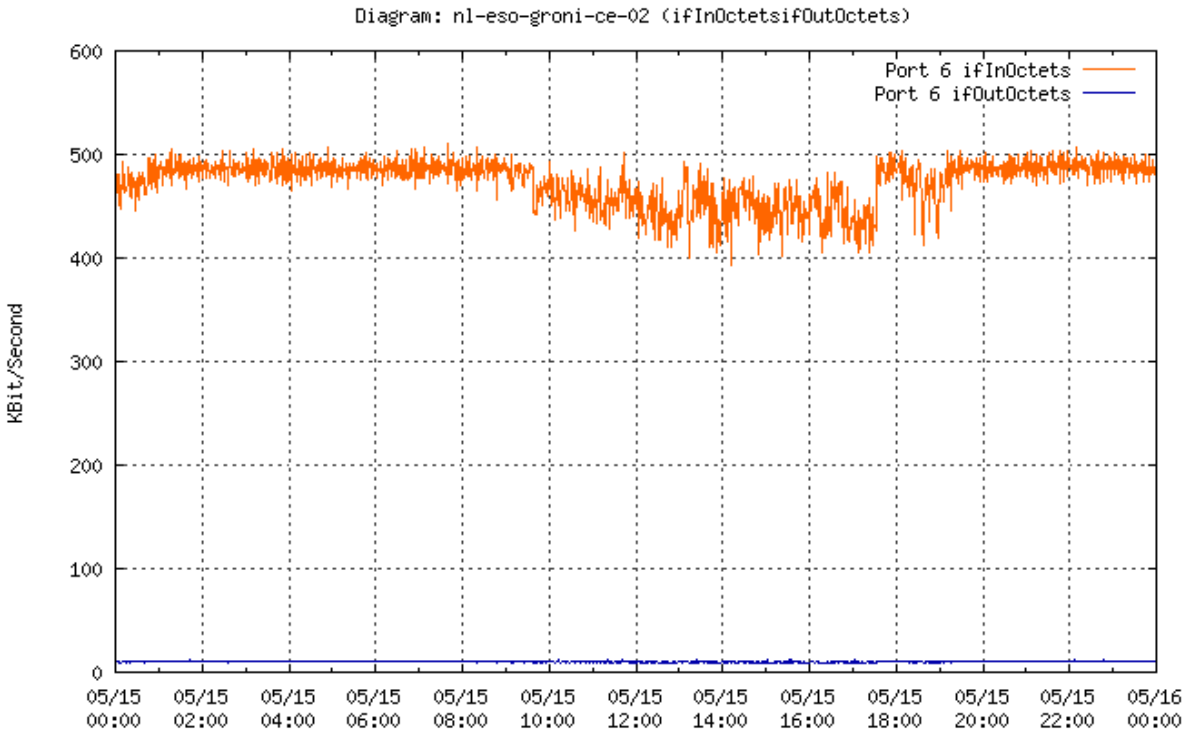
RAL leased line :



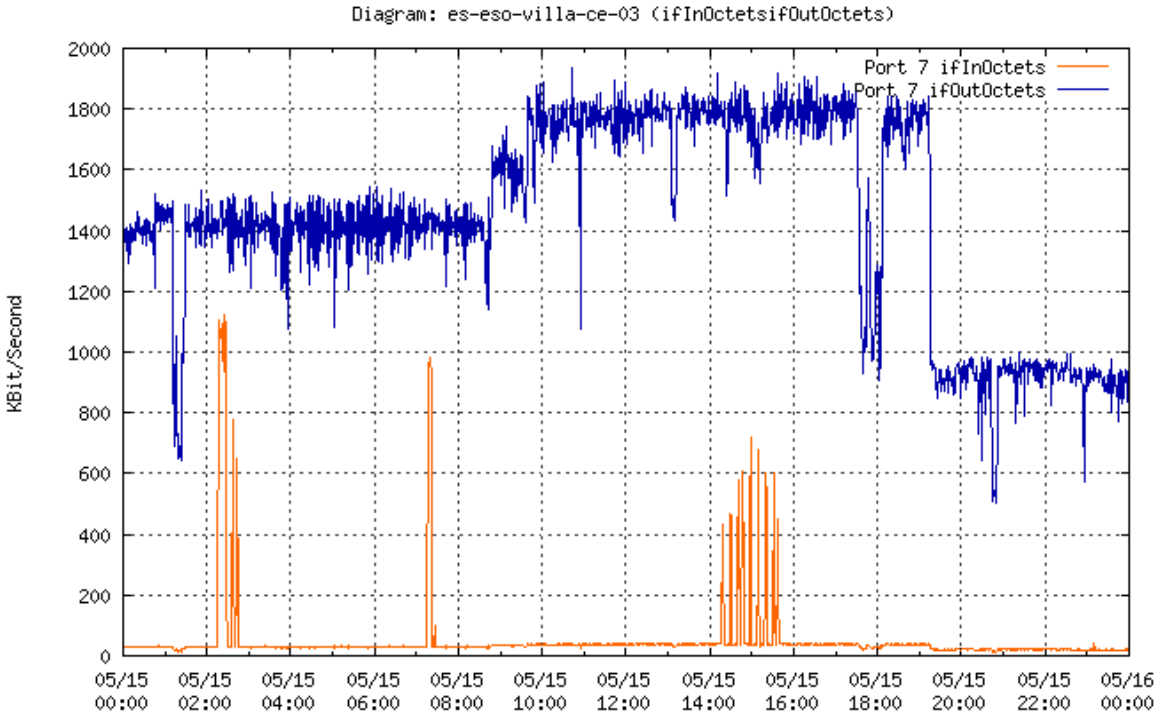
PACS leased line :(the DSL has no traffic)



Groningen leased line :(the DSL has no traffic)



HSC 1



HSC 2

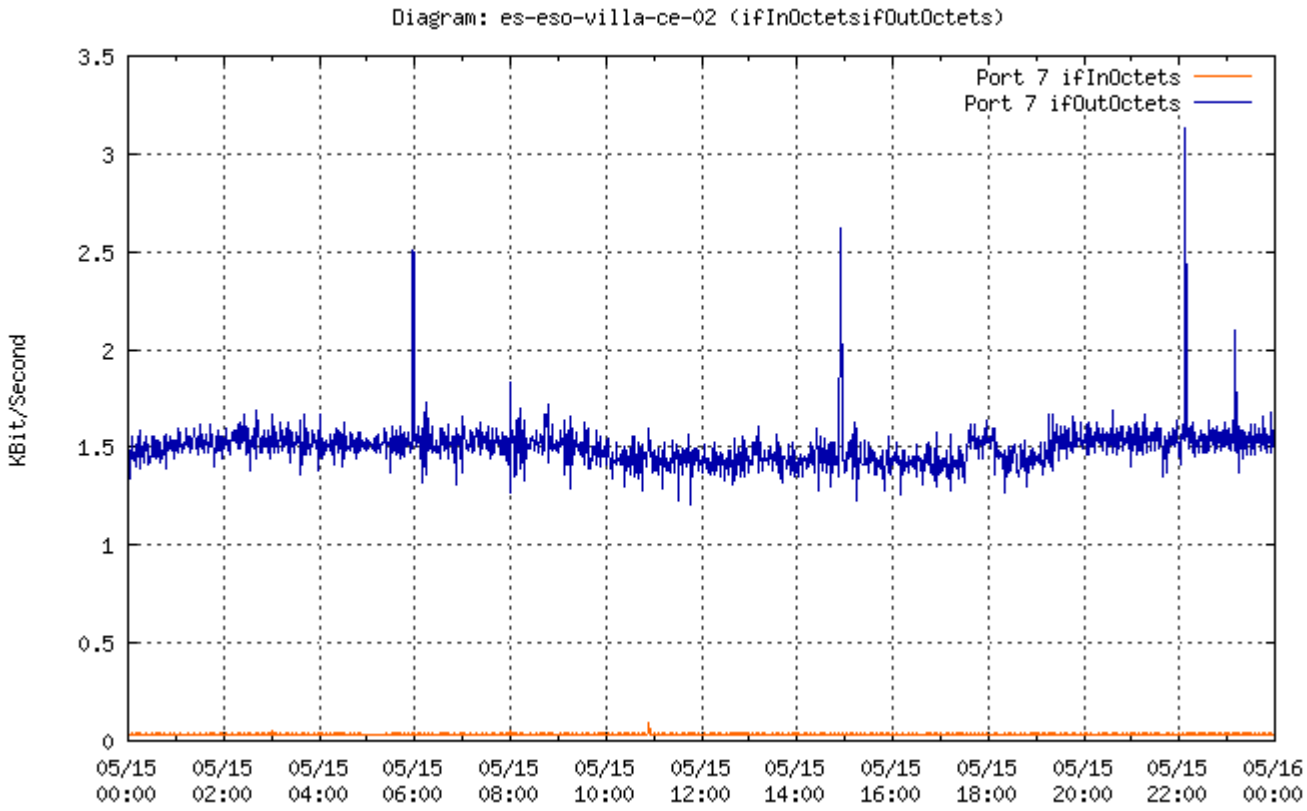


Diagram: es-eso-villa-ce-02 (ifInOctetsifOutOctets)
Port 7 ifInOctets
Port 7 ifOutOctets
KBit/Second
3.5
3
2.5
2
1.5
1
0.5
0
05/15 00:00
05/15 02:00
05/15 04:00
05/15 06:00
05/15 08:00
05/15 10:00
05/15 12:00
05/15 14:00
05/15 16:00
05/15 18:00
05/15 20:00
05/15 22:00
05/16 00:00

10.3 Propagation

10.3.1 Relevant Documentation

[PROP-1] DB Administration Procedures, Issue 1.0, HERSCHEL-HSC-DOC-0833

10.3.2 Propagation during operations

The full details as to how propagation works can be found in [PROP-1] and won't be repeated here.

Ports in use

Propagation takes place between the HSC & the ICCs using the following ports :

	HIFI	PACS	SPIRE
Propagation	2372	2375	2378

Machines in use

The HSC shall propagate data from its herdb01 machine to the following 3 ICC machines :

PACS : pacs6 machine
HIFI : esatest.sron.rug.nl
SPIRE : chesterfield.bnsc.rl.ac.uk

Data to be propagated

It has been agreed that house keeping data with the following APIDs is propagated to all targets.

HIFI: 1024, 1025, 1026, 1027
PACS: 1152, 1153, 1154, 1155
SPIRE: 1280, 1281, 1282, 1283
EGSE: 2016-2046
SPACECRAFT: 0, 16, 18, 64, 128, 130, 512, 514, 576, 578, 640, 642, 768, 770

How will propagation be run

During operations, the propagation daemon shall be up on a 24*7 basis at the HSC and at each of the ICCs.

The HSC retrieves the data from the MOC Data Disposition System (DDS) using its DDS Client Software. This software functions through sending initially a request for the catalogue (consolidation) of new data existing in the DDS. Upon reception of this catalogue, the DDS client software starts sending requests for the new data per APID that is stated by this catalogue to exist in the DDS.

The TM data is ftped to the HSC Interface server whereby it is then copied into the herdb01 machine. Upon reception in the appropriate directory of herdb01, the TM Ingest software (which shall also be run on a

continous 24*7 basis) shall recognise its arrival and shall start processing the file. As the data is being stored into the versant DB so this same data starts to be propagated to the ICCs.

It is worth mentioning that when the DDS client has completed its transfer of all data from the previous OD, then it generates a message file which shall be sent to the SPG to allow the start conditions of automatic processing to be initiated.

This message file is also made available on the FTP Ops server in the following directory :

/home/hsc_icc/toICCs/others/ddsflag

When propagation is completed to the ICC then a ***propagation completion email*** shall be sent to the ICCs. In addition ***a propagation completion file*** shall be placed in the following directory of the FTP Ops server :

/home/hsc_icc/toICCs/others/prop_status

10.3.3 Ensuring Consistency of Propagated data between Centres

The following methods should be applied to check for correctness of data sets being propagated between the centres :

(a) The HSC Gap Checker Tool – This will be run on a nightly basis after reception of all data from the MOC for an OD. Its output will be placed on the FTP Ops Server in the following directory :

/home/hsc_icc/toICCs/others/gaps_report

It is made available for the ICCs to compare against what is in their DB for their APIDs. See also next subsection.

(b) Missing TM processor product – This can be run against the DB and the output printed to an ASCII file.

(c) Db2tty – This is a DB admin tool which runs and checks the number of object instances in the DB. A comparison against the output of the HSCs running of this tool can be performed however it must be said that such a comparison is very limited due to the fact that the HSC will have a great deal more e.g. TM packets in its DB than each ICC.

10.3.4 Informing the ICCs about changes in data completeness

The HSC S/w Maintenance team performs on a daily basis a check on the "GAP - ACTION REQUIRED" flags that are contained in the HSC Gap report file. This may lead to data needing to be re-requested from the MOC. Where such a re-request results in a gap being filled then the S/W Maintenance team has agreed to send an email to the impacted Operations Centre to inform them of this.

In addition, the Twiki page containing the gap status for each OD can be found here :

http://www.herschel.be/twiki/bin/view/Hcss/CoreHcss

If a new file arrives e.g. requested from HSC (as above) or a closed consolidation window from MOC, after propagation of that OD is made then the S/W Maintenance group shall also send an email to the ICC Operations Centre informing of this + they will update the relevant OD data status to include a new section called "Late TM file arrival" which shall list the file in question

10.3.5 Problems with propagation during operations

Where problems occur with the propagation process then an email should be sent from the ICCs to the following email address : hscops@sciops.esa.int & to the HSC DB administrator.

An SPR should also be raised on the HCSS Store Module in the HCSS SxR System to track the problem.

Emails sent from the HSC shall be sent to the three standard ICC Operational Email addresses + the Herdbops Email address.

10.4 HSC FTP Operational Server provided data

10.4.1 Relevant Documentation

[FTP-1] Herschel science ground segment FTP interface control document, HERSCHEL-HSC-ICD-0968,

10.4.2 The HSC FTP Operational server

Background

The HSC FTP Operational server is located on the HSC Prime Interface machine with the outside world i.e. herfts02.

Login to the FTP site on this machine is only allowed over the lease lines that connect the HSC with the ICCs. The reason for this stems from the operational safety of data which are transferred via this interface namely OBSM image files, TPF files, Mission Planning files.

Informing the ICCs of new file deliveries

All Auxiliary files (TM not included) that the HSC receives from the MOC (via DDS or FTS) are transferred onto the HSC Ops machine as well as being placed on the FTP Operational server. These files result in an email being sent to the hscops & the ICC email addresses below.

Emails shall start with the following subject : Received /home/hsc/data/HFTS/received/files/ followed by the file name as specified on the next page.

The following email addresses shall receive the notification of arrival of new files on this server :

HSC
- hscmps@sciops.esa.int
- lorourke@sciops.esa.int
- jbrumfit@sciops.esa.int

HIFI
- hifi-operations@sron.nl

PACS
- klaas@mpia-hd.mpg.de
- v.doublier@mpe.mpg.de
- nielbock@mpia-hd.mpg.de

SPIRE
- spire@stfc.ac.uk
- sarah.leeks@stfc.ac.uk

Current directory structure of the HSC FTP Operational Server

The directories on this server are broken into two main categories corresponding to those files being delivered from HSC to the ICCs and those files being delivered from the ICCs to the HSC. These categories get broken down to further subcategories based upon the types of files being exchanged i.e.

- Mission Planning Files
- OBSM files
- MIB/HPSDB
- Others

(i) Files to the ICCs – Mission Planning

The following directory structure has been implemented on this FTP site whereby all files received/sent by the HSC & the MOC using the File Transfer System (FTS) shall be placed in the relevant directories and untarred :

/home/hsc_icc/toICCs/mps/xxxx

whereby xxxx corresponds to the following file types : pos_icp, siam, sso, psf, tsf, epos, oem. All these files are either required by the ICC to perform mission planning (siam, sso, psf, oem, obdb, stpf) or to be aware of the status of planning by the HSC (pos_icp, tsf, epos).

The following filenames shall appear in the subject line of the emails being sent to the ICCs email addresses:

- OEM = Orbit file (Orbit Ephemeris File)
- PSF = Planning Skeleton file
- TSF = Timeline Summary file
- STPF = Slew Time Prediction File
- OBDB = On board database
- SIAM = Spacecraft Instrument Alignment Matrix
- EPOS = Enhanced POS – Flight Dynamics processed POS/ICP file
- Long Term & Short Term Horizons files (see section 10.4.3)

Here is an example :
“Received /home/hsc/data/HFTS/received/files/PSF__SDAHSC_D_0030_0001_____00000.HERS (for ICCs)”

(ii) Files to the ICCs - OBSM

/home/hsc_icc/toICCs/obsm/obsm_xxxx

whereby xxxx corresponds to the ICC to which the OBSM dump file belongs i.e. hifi, pacs or spire.

The following filenames shall appear in the subject line of the emails being sent to the ICCs email addresses:

- IOBS = Instrument On-Board Software

(iii) Files to the ICCs – MIB/HPSDB

/home/hsc_icc/toICCs/mib

As the HSC receives a single tar file containing the HPSDB (which includes the 3 merged instrument MIBs) from the MOC during operations then this file will be copied to this directory for access by the ICCs.

The following filenames shall appear in the subject line of the emails being sent to the ICCs email addresses:

- SDB = Satellite Database file

(iv) Files to the ICCs – Housekeeping

Instrument & Spacecraft HK data files are placed on the HSC FTP Ops site to facilitate the failure scenario whereby propagation has gone down, there is an instrument error and the ICC wishes to look at the HK from their instrument generated during the last OD. Further details are provided in the last section.

/home/hsc_icc/toICCs/hktm/xxxx

whereby xxxx corresponds to the following : pacs, spire, hifi & spacecraft

(v) Files to the ICCs – Others (AHF, OEF, Prop status, Gaps Report, DDS Flag)

/home/hsc_icc/toICCs /others/xxxx

whereby xxxx corresponds to the following file types : oef, ahf, gaps report, dds flag, propagation status. These are files just sent for information purposes only i.e. Orbit Event File & Attitude History File. The Gaps report is a file sent to the ICCs to allow them to compare against when they run the gap checker software on their propagated DB. The DDS flag

The following filenames shall appear in the subject line of the emails being sent to the ICCs email addresses:

- OEF = Orbit Event file
- AHF = Attitude History file

No emails shall be sent related to the gaps report nor the dds flag. An email is sent however informing the ICCs when the propagation has been completed for the night. This is linked to the propagation status flag.

(vi) Files from the ICCs – OBSM

The OBSM Image files delivered from the ICCs to the HSC are described in more detail in chapter 8.2. The directory structure described there is shown below :

/home/hsc_icc/fromICCs/obsm/obsm_xxxx

whereby xxx corresponds to pacs, spire or hifi

(vii) Files from the ICCs – Task Parameter Files (TPF)

Task Parameter Files are effectively outputs from CUS which correspond to a particular Flight Operations Procedure that has been delivered from the ICC to the MOC. Upon the loading of these files onto the SCOS2000 system of MOC, this will result in the parameter values of the commands contained in that procedure being replaced by those in the TPF.

/home/hsc_icc/fromICCs/tpf/tpf_xxxx

whereby xxxx corresponds to pacs, spire or hifi

10.4.3 Short term & long term horizons file delivery interactions

The text below has been taken from an email sent by LO'Rourke to all HSC & ICC Uplink co-ordinators on the 10th September 2009.

(a) Short Term Horizons files

Short term horizons files are used by the Mission Planning System.

The short term horizons files are retrieved covering a period of 25th of month A to the 1st of Month C e.g. 25th August to 1st October. They have a time step of 45 minutes.

I have agreed with the HSC Mission Planning Group that they shall ensure that there are three months of short term horizons files on the Operational FTP site. The HSC MPS team shall inform the ICCs when they have retrieved & placed on the FTP site a new set of files.

If the ICC requires an additional horizon file to be added to what is provided then they should send an email to the HSC MPS team who shall then make the retrieval and update the directories on the FTP site.

The switch at the ICC & at the HSC from one set of files to a new set of files I leave to the mission planners at the centres to decide. I say this because PACS may be scheduling the 24th & 25th August and they may not wish to change the horizons files between these two ODs. In fact there is no need to change so quickly seeing as they have the 6 day grace period to make the switch.

Clearly, if on the 2nd October the switch is not done then you will find this out when you use the mission planning system.

I am trying to put in place the rsync capability such that when new files arrive on the FTP site then the ICCs will get them also.

(b) Long Term horizons files

Long term horizons files are used only by HSpot and are nominally delivered with HSpot releases by the HSC (Rafa Andres). They are located in a folder on the Jboss server in use at the HSC and at the ICCs.

The long term horizons files are retrieved covering the duration of the mission. They have a time step of 720 minutes.

If there are some long term horizon files that the ICC or HSC needs to have included that is not there then please send Rafa and the HSC MPS an email to request it.

The HSC MPS shall retrieve the file, place it on the HSC FTP account in the /home/hsc_icc/toICCs/mps/long_term_horizons directory.

The ICC will then be sent an email from Rafa informing you where to place this file on the Jboss system.

I have provided the HSC MPS team with an updated long term horizons retrieval procedure which reflects the above points.

10.5 Retrieving Aux & SPG Products from the HSA

10.5.1 Relevant Documentation

[Product-Transfer-1] Herschel Bulk Product Transfer ICD, issue 1.0, HERSCHEL-HSC-ICD-1083.

10.5.2 Retrieval of Auxiliary (including pointing) Products from the HSA

Auxiliary products are generated by the aux processor software and are placed in the Herschel Science Archive.

Such Auxiliary Products include :

- Pointing Product
- Time Correlation Product
- Missing TM product
- SIAM product
- Uplink product (TBC whether generated up to now)
- Orbit Event product (not yet produced up to now)

The ICCs access to the auxiliary data contained Herschel Science Archive shall be through the use of the Bulk Product Transfer Mechanism.

An example script is shown in that ICD (see 10.4.1) which demonstrates how this data can be retrieved from the HSA via this mechanism. Further example scripts are provided in the Wiki page.

10.5.3 Retrieval of SPG generated Products from the HSA

Auxiliary products are generated by the SPG pipelines and are placed in the Herschel Science Archive.

The ICCs access to the SPG data contained Herschel Science Archive shall be through the use of the Bulk Product Transfer Mechanism.

An example script is shown in that ICD (see 10.4.1) which demonstrates how this data can be retrieved from the HSA via this mechanism. Further example scripts are provided in the Wiki page.

10.5.4 Knowing what is in the HSA

Queries can of course be made to the HSA to define its contents.

For the case of the Auxiliary data products, the HSC DP Pipeline Operators shall update the Wiki page on a daily basis, defining the processing status of these products and confirming their placement in the archive.

If there is an update of a specific aux product then the DP Pipeline Operators will also inform the ICCs of this fact.

The Wiki page shall show the name of each auxiliary product generated during the previous processing that has been placed in the HSA.

10.5.5 Informing the ICCs about changes in Aux product versions

Firstly the DP report during the morning briefings shall now report of the arrival of a newer version of an aux product + it shall report (as it currently does anyway) when reprocessing is performed of an Operational Day.

Secondly the DP Twiki page already contains details of updated aux products but today a new section has been added for changed versions of the pointing product. This should be reviewed by the ICCs on a daily basis.

Thirdly, MOC flight Dynamics have been asked to include the ICC Operations Centre Email addresses in their distribution list when they inform the HSC of the transfer of an AHF to the HSC. This email is sent once on a nightly basis but can also be sent where a newer version of an AHF is generated and sent. This ensures that the ICCs are informed at the earliest opportunity that an AHF newer version has been sent and that therefore a new pointing product exists.

APPENDIX 1 OPS_HCSS_TM_INGEST.props File contents

```
# TM Ingestion
hcss.tmingest.database= DBNAME@DBSERVER
hcss.tmingest.server = localhost
hcss.tmingest.port = 9877
hcss.tmingest.routerretry = 60000
hcss.tmingest.name = TelemetryIngestion
hcss.tmingest.tmpacketprocessor.hifi.name = herschel.tmproc.fifo.NullTmPacketProcessor
hcss.tmingest.tmpacketprocessor.pacs.name = herschel.tmproc.fifo.NullTmPacketProcessor
hcss.tmingest.tmpacketprocessor.spire.name = herschel.tmproc.fifo.NullTmPacketProcessor
hcss.tmingest.transactions = 1000
hcss.tmingest.timerduration = 1800000
hcss.tmingest.tmpacketprocessor.hifi=N
hcss.tmingest.tmpacketprocessor.pacs=N
hcss.tmingest.tmpacketprocessor.spire=N
hcss.tmingest.connectiontype = DDS
var.tmingest.dir = /home/YOUR_TLM_INPUT_FOLDER
hcss.tmingest.ddsdir = {${var.tmingest.dir}}
hcss.tmingest.ddstmsuffix = .TLM
hcss.tmingest.ddsflagfile = ./dds_spg_flag.prop
hcss.tmingest.tmflagfile = ./tm_spg_flag.prop
hcss.tmingest.dataframefolder = ${var.tmingest.dir}
hcss.ccm.mission.config = democonfig
# TM Ingestion (Inst Apids)
hcss.tmingest.apid1024 = Y
hcss.tmingest.apid1025 = Y
hcss.tmingest.apid1026 = Y
hcss.tmingest.apid1027 = Y
hcss.tmingest.apid1028 = Y
hcss.tmingest.apid1029 = Y
hcss.tmingest.apid1030 = Y
hcss.tmingest.apid1031 = Y
hcss.tmingest.apid1152 = Y
hcss.tmingest.apid1153 = Y
hcss.tmingest.apid1154 = Y
hcss.tmingest.apid1155 = Y
hcss.tmingest.apid1156 = Y
hcss.tmingest.apid1157 = Y
hcss.tmingest.apid1158 = Y
hcss.tmingest.apid1159 = Y
hcss.tmingest.apid1280 = Y
hcss.tmingest.apid1281 = Y
```

hcss.tmingest.apid1282 = Y
hcss.tmingest.apid1283 = Y
hcss.tmingest.apid1284 = Y
hcss.tmingest.apid1285 = Y
hcss.tmingest.apid1286 = Y
hcss.tmingest.apid1287 = Y
hcss.tmingest.apid1288 = Y
hcss.tmingest.apid1289 = Y
# TM Ingestion (S/C Apids)
hcss.tmingest.apid0 = Y
hcss.tmingest.apid16 = Y
hcss.tmingest.apid18 = Y
hcss.tmingest.apid64 = Y
hcss.tmingest.apid128 = Y
hcss.tmingest.apid130 = Y
hcss.tmingest.apid512 = Y
hcss.tmingest.apid514 = Y
hcss.tmingest.apid576 = Y
hcss.tmingest.apid578 = Y
hcss.tmingest.apid640 = Y
hcss.tmingest.apid642 = Y
hcss.tmingest.apid768 = Y
hcss.tmingest.apid770 = Y
hcss.tmingest.apid2047 = Y
# TM Ingestion (EGSE Apids)
hcss.tmingest.apid2016 = Y
hcss.tmingest.apid2017 = Y
hcss.tmingest.apid2018 = Y
hcss.tmingest.apid2019 = Y
hcss.tmingest.apid2020 = Y
hcss.tmingest.apid2021 = Y
hcss.tmingest.apid2022 = Y
hcss.tmingest.apid2023 = Y
hcss.tmingest.apid2024 = Y
hcss.tmingest.apid2025 = Y
hcss.tmingest.apid2026 = Y
hcss.tmingest.apid2027 = Y
hcss.tmingest.apid2028 = Y
hcss.tmingest.apid2029 = Y
hcss.tmingest.apid2030 = Y
hcss.tmingest.apid2031 = Y
hcss.tmingest.apid2032 = Y
hcss.tmingest.apid2033 = Y
hcss.tmingest.apid2034 = Y
hcss.tmingest.apid2035 = Y

```
hcss.tmingest.apid2036 = Y
hcss.tmingest.apid2037 = Y
hcss.tmingest.apid2038 = Y
hcss.tmingest.apid2039 = Y
hcss.tmingest.apid2040 = Y
hcss.tmingest.apid2041 = Y
hcss.tmingest.apid2042 = Y
hcss.tmingest.apid2043 = Y
hcss.tmingest.apid2044 = Y
hcss.tmingest.apid2045 = Y
hcss.tmingest.apid2046 = Y
# General
hcss.store.factory = herschel.versant.store.ReplStoreFactoryImpl
hcss.ccm.factory = herschel.versant.ccm.CoreFactoryImpl
hcss.cus.factory = herschel.cus.compiler.CusFactoryImpl
```

APPENDIX 2 OPS_setHcssEnvironmentTmIngest File contents

setenv HCSS_PROPS ${HOME}/.hcss/OPS_HCSS_TM_INGEST.props
setenv PATH ${PATH}:${HOME}/bin:/herschel/software/hcss/hcss_1.2.6/linux_64bit/bin/
setenv VERSANT_ROOT /herschel/software/external/versant/current