

	CEA/SAp Management Plan for the HERSCHEL Project	 SAp-FIRST-JLA-0038-01 Issue: 4.0 Date : 23/01/03 Page : 1/20
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CEA/SAp Management Plan for the HERSCHEL Project

Reference: SAp-FIRST-JLA-0038-01
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	Position	Name	Date	Visa
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Approved by	PA Responsible			
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DOCUMENT STATUS and CHANGE RECORD

Date	Issue	Affected pages
14/12/00	1.0	Creation
07/09/01	2.0	All pages: - "Herschel" replaces "First" everywhere - Sept. 01 status updates
28/11/01	3.0	All pages affected
23/01/03	4.0	PACS BOLA suppression impact, ref. doc. update, schedule impact and a couple of cosmetic changes. All pages affected.

Applicable Documents:

MoUs and business agreements

AM1	Accord Cadre CNES/CEA	Signed	03/07/98	CEA/A4516
AM2	Lettre CNES-CEA pour FIRST	Draft	05/09/00	00.190/SAp-LV
AM3	Convention de recherche CEA/CNES	Signed	15/11/01	737/CNES/01/8919/00
AM4	MoU CEA-CNES pour SPIRE	Draft	08/01/01	
AM5	MoU CEA-CNES pour PACS	Signed	29/10/01	PACS-ME-LE-005
AM6	CEA/DSM-LETI: Convention	Signed	30/10/00	00-161/SAp.JLA
AM7	CEA/DSM-LAM-CNES: Convention	Draft 0.3	21/12/00	
AM8	MoU CEA-JPL	Signed	10/11/01	SAp-SPIRE-LV-28-01
AM9	Business agreement SAp-SBT	Signed	16/10/00	00.166/SAp.JLA
AM10	MoU SAp-SIG: CR CER FIRST	Agreed	14/06/00	0G CER R 003-2000
AM11	MoU SAp-SEI: CR CER FIRST	Agreed	14/06/00	0G CER R 003-2000

SPIRE & PACS

AH1	Standard Product Assurance Plan	Issue: 1.0	07/11/00	SAp-GERES-FL0-436-00
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SPIRE

AS1	Instrument Development Plan	Issue: 1.1	12/04/01	SPIRE-RAL-PRJ-0035
AS2	Major Milestone List	Last agreed issue		SPIRE-RAL-PRJ-00455

PACS

AP1	Basic I/F of Bol. Integration into PACS	Issue 1.0	25/08/00	PACS-ME-ID-002
AP2	PACS Project Management Plan	Issue 1.0	06/12/00	PACS-ME-PL-008
AP3	PACS Master Schedule	Last agreed issue		PACS-ME-PL-010

Reference Documents:

SPIRE & PACS

RH1	Herschel/Planck IID-A	SCI-PT-IIDA-04624
RH2	Herschel/planck delivery of Scientific Instrument Models	SCI-PT/012993
RH3	Découpage Budgétaire pour FIRST	SAp-FIRST-JLA-0013-00
RH4	Plan de gestion de la documentation	SAp-FIRST-FLo-0002-00

SPIRE

RS1	SPIRE IID-B	SCI-PT-IIDB/SPIRE-02124
RS2	Instrument Requirement Document	SPIRE-RAL-PRJ-000034
RS3	Instrument Model Philosophy	BS-12/07/00 - Note
RS4	Liste des documents SPIRE	SAp-SPIRE-FLo-0028-00
RS5	SPIRE WE & WIH Development Plan	SAp-SPIRE-JLA-0047-01
RS6	SPIRE PAP	BOL/RAL/D/0017.01
RS7	Product Tree	SPIRE-RAL-PRJ-00030

PACS

RP1	PACS IID-B	PT-PACS-02126
RP2	Instrument Requirement Document	PACS-ME-RS-005
RP3	PACS Project Management Plan	PACS-ME-PL-008
RP4	PACS Instrument Product Tree	PACS-ME-LI-002
RP5	PACS Phot. FP Development Plan	SAp-PACS-JLA-0001-00
RP6	PACS BOLC/BOLA Development Plan	SAp-PACS-JLA-0053-01
RP7	Liste des documents PACS	SAp-PACS-FLo-0003-00
RP8	PACS PAP	PACS-ME-PL-009
RP9	Instrument Product Tree	PACS-ME-LI-002
RP10	Design, Development and Verification Plan	PACS-ME-PL-002

List of used acronyms

AIV	Acceptance, Integration and Validation
AVM	AVionic Model
BFP	Bolometer Focal Plane
CDR	Critical Design Review
CEA	Commissariat à l'Energie Atomique
CNES	Centre National d'Etudes Spatiales
Co-I	Co-Investigator
Co-PI	Co-Prime Investigator
CQM	Cryogenic Qualification Model
CSL	Centre Spatial de Liège
DAPNIA	Département d'Astrophysique, de Physique Nucléaire et d'Instrumentation Associée
DAPSASC	DAta Processing and Science Analysis Center
DCU	Detector Control Unit
DPU	Data Processing Unit
DRCU	Detector Readout Control Unit
DTA	Direction des Technologies Avancées
DTU	DRCU Test Unit
ESA	European Spatial Agency
FIRST	Far InfraRed Submillimetre Telescope (early Herschel name)
FM	Flight Model
FPU	Focal Plane Unit
FS	Flight Spare model
IBDR	Instrument Baseline Design Review
I&T	Integration and Test
I/F	Interface
ICC	Instrument Control Center
ICD	Interface Control Document
IID	Instrument Interface Document
IRD	Instrument Requirements Document
ISVR	Instrument System Verification Review
JPL	Jet Propulsion Laboratory
LAM	Laboratoire d'Astrophysique de Marseille
LETI	Laboratoire d'Electronique, de Technologie et d'Instrumentation
LMRI	Laboratoire de Mesure des Rayonnements Ionisants (CEA)
MPE	Max Planck institute für Extraterrestrische Physik
OBS	Organisation Breakdown Structure
PA	Product Assurance
PACS	Photoconductor Array Camera and Spectrometer
PAP	Product Assurance Plan
PDR	Preliminary Design Review
PFM	Proto Flight Model
PhFPU	Photometer Focal Plane Unit
PM	Project Manager
QM	Qualification Model
QMW	Queen Mary and Westfield College
RAIV	Realisation, Acceptance, Integration & Validation

RAL	Rutherford Appleton Laboratory
SAp	Service d'Astrophysique (CEA/DAPNIA)
S/C	SpaceCraft
SBT	Service des Basses Températures
SCU	Subsystem Control Unit
SEDI	Service d'Électronique, des Détecteurs et d'Informatique (CEA/DAPNIA)
SIS	Service d'Ingénierie des Systèmes (CEA/DAPNIA)
SM	Structural Model
SMEC	Spectrometer MEchanism
SOAM	Structure and Optical Alignment Model
SPIRE	Spectral and Photometric Imaging REceiver
STM	Structural and Thermal Model
TBD	To Be Defined
WBS	Work Breakdown Structure
WE	Warm Electronics
WIH	Warm Interconnect Harness

Summary

1	Introduction.....	8
1.1	Purpose of the document.....	8
1.2	Scope.....	8
1.3	Herschel Project Main Milestones.....	8
1.4	CEA/SAp Contribution to SPIRE & PACS instrument development.....	9
2	Project organisation.....	11
2.1	HERSCHEL Team organisation at SAp.....	11
2.2	Roles and responsibilities of the key personnel.....	11
2.3	Roles and responsibilities of the teams.....	13
3	Working relationships and mutual commitments.....	14
3.1	CNES and CEA Partnership.....	14
3.2	CNES & CEA vs. SPIRE Consortium.....	14
3.3	CNES/CEA vs. PACS Consortium.....	15
3.4	Collaboration with JPL.....	15
3.5	Collaboration with the LETI.....	15
3.6	Collaboration with the SBT.....	15
3.7	Collaboration with the LAM.....	15
3.8	Collaboration with the CSL.....	16
3.9	Collaboration with the SEDI Department.....	16
3.10	Collaboration with the SIS Department.....	16
3.11	Collaboration with the Commercial Department of the CEA.....	16
4	Project Management.....	17
4.1	Project control.....	17
4.2	Progress monitoring.....	19
4.3	Documentation management.....	20

1 Introduction.

SPIRE and PACS are two of the three instruments to be embarked aboard the HERSCHEL spacecraft, which will be launched in 2007.

SPIRE and PACS Consortia are committed to build and deliver to ESA 4 instrument models:

1. **AVM** : concerns mainly the electronics interface with the S/C.
2. **CQM** : encompasses a flight representative FPU (not necessarily fully detector populated) and a functional WE.
3. **PFM** : fully compliant model
4. **FS** : consists in PFM replica or spare units (depending on the considered subsystem).

S/C – Instruments interfaces are described in the IIDs documents: IID-A [RH1] and SPIRE & PACS IID-Bs [RS1] [RP1].

1.1 Purpose of the document.

This document describes the CEA/SAp management organisation including collaboration relationships with other CEA department and external institutions for the contribution of the CEA/SAp to the SPIRE and PACS instruments.

1.2 Scope.

This plan is only related to the contribution of the CEA/SAp to the SPIRE and PACS instrument development. It neither concerns the contribution of the CEA/SAp to the ICCs nor to the DAPSASC. It does not address the Science activity on both projects either.

1.3 Herschel Project Main Milestones.

At the time this issue is issued, the Instrument delivery milestones are given in [RH2]

Milestones	Resp.	Date
ISVR	ESA	Nov. 2000
IBDR	ESA	March 2002
IIDR	ESA	June 2003
Instrument AVM Delivery to ESA	Instruments	Oct. 2003
CQM Delivery to ESA	Instruments	Oct. 2003
Instrument PFM delivery to ESA	Instruments	Jan. 2005
Instrument FS delivery to ESA	Instruments	Jan. 2006

1.4 CEA/SAp Contribution to SPIRE & PACS instrument development.

1.4.1 CEA/SAp Contribution to SPIRE instrument.

SPIRE consists in a Photometer and a Spectrometer respectively equipped with infrared detector focal planes. The wavelength operating range of SPIRE is $200\mu - 600\mu$.

The CEA/SAp is committed to develop and deliver to the SPIRE Consortium the following Warm Electronics sub-systems:

- The Detector Readout and Control Unit (DRCU) models.
- The Warm Interconnect Harness (WIH) models.
- The FPU simulator.

In addition, the CEA/SAp is responsible in front of the CNES of the overall CEA contribution to HERSCHEL.

As such, the CEA/SAp is responsible for the delivery of the models of the cryo-cooler built by the CEA/SBT and used on SPIRE and PACS as well. However, for practical reason, CEA/SBT interfaces directly with the SPIRE Consortium as far as technical matter are concerned.

SPIRE Project Main SAp Milestones:

Milestones	Resp.
STM Cooler Delivery to RAL	SBT/SAp
CQM Cooler Delivery to RAL	SBT/SAp
DRCU & WIH QM1 Delivery to RAL	SAp
FPU Simulator delivery to RAL	SAp
FM Cooler delivery to RAL	SBT/SAp
FS Cooler delivery to RAL	SBT/SAp
DRCU & WIH QM2 Delivery to RAL	SAp
DRCU & WIH FM Delivery to RAL	SAp

1.4.2 CEA/SAp Contribution to PACS instrument.

PACS consists in a Photometer employing two Ge:Ga photoconductor arrays (stressed/unstressed) and two bolometer arrays to perform imaging line spectroscopy and imaging photometry in the 60 - 210 micron wavelength band.

The CEA/SAp is responsible for the development and the delivery of the models of the Photometer Focal Plane Unit as well as the corresponding readout and control electronics.

Cold Focal Plane contribution:

The PACS Photometer Focal Plane Unit (PhFPU) consists in:

- 2 Bolometer Focal Planes (BFPs Blue (60 μ to 130 μ) and Red (130 μ to 200 μ)).
- 1 Cryo Cooler built by the CEA/SBT used to cool down the bolometers to their working temperature (300mK).
- A Mechanical structure bearing the blue and red BFPs, the optical filters and the Cryo-Cooler. It ensures the 2K-4K insulation and provides the mechanical interface with the rest of the PACS instrument.

It is planned to build and deliver to MPE 5 models of the PhFPU:

1. A Structure Model to be integrated to the PACS SM.
2. A Structure and Optical Alignment Model (SOAM) that is intended for checking the mounting capability of the PhFPU and for carrying out the warm and cold optical alignment on the integrated instrument.
3. A CQM which will undergo the qualification test and demonstrates that the instrument requirements have been met. This model will be equipped with a limited number of working bolometer arrays.
4. An FM (fully qualified and fully functional).
5. An FS model which is an FM replica.

Warm electronics contribution:

The CEA/SAp is responsible for the provision of:

- the Readout and Control electronics for the PhFPU which consists in:
 - An electronics box (BOLC) encompassing the readout and control electronics of the bolometers, the control electronics for the cryo-cooler.
 - A Power Supply Unit (PSU).
 - A Warm Interconnect Harness between the BOLC box and the upper electronics stage (DEC/MEC) provided by CSL.
 - The test harness linking the BOLC I/O channels to the PACS cryogenic test facility.
- a PhFPU simulator.

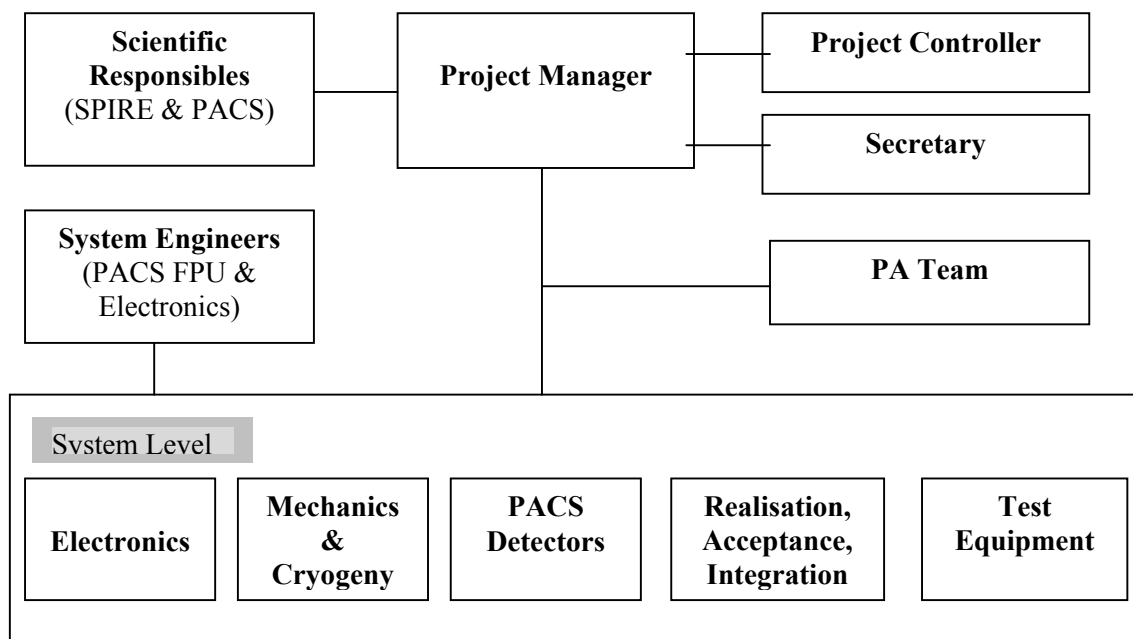
PACS Project Main SAp Milestones [AP4]:

Milestones	Resp.
PACS / CEA Kick-off meeting	PACS/SAp
PhFPU ST delivery to MPE	SAp
PhFPU SOAM delivery to MPE	SAp
PhFPU CQM, BOLC QM1, FPU Simulator and test harnesses Delivery to MPE	SAp
PhFPU and BOLC FM Delivery to MPE	SAp
PhFPU FS and BOLC FS spares Delivery to MPE	SAp

2 Project organisation.

Taking the opportunity of the broadly similar schedule and development philosophy of the two instruments, an unique HERSCHEL Team led by a Project Manager has been set up at SAp. This organisation allows to get the maximum flexibility from the available resources and to take benefit from common developments.

2.1 HERSCHEL Team organisation at SAp.



2.2 Roles and responsibilities of the key personnel.

2.2.1 Scientific Responsible.

There is one Scientific Responsible per instrument.

They are in charge of taking care of the compliance of the developments with respect to the Scientific requirements. They make any decisions (together with the Project Manager) that could have an impact on the scientific capabilities of the instruments.

The scientific responsible liaise with the scientific community. They attend the Instrument Consortium meetings as well as the HERSCHEL Science Team meetings.

2.2.2 System Engineers.

The System Engineers are in charge of taking care of the compliance of the development with the technical requirements. They make any decisions (together with the Project Manager) as far as these requirements are concerned.

2.2.3 Project Manager.

The Project Manager is responsible in front of the CEA, the CNES and the Instrument Project Managers of SPIRE and PACS for the progress of the Project works.

The Project Manager is also responsible in front of the CEA and the CNES as far as the funding and staff resources are concerned.

The Project Manager writes and maintains the Management Plan, the development Plans and the development schedules and makes, in last resort, any decisions which could have an impact on the development progress or on the budget.

He his the contact point concerning all the managerial issues with all the organisations external to the SAp.

He is assisted by:

- a Project Controller who assists the Project Manager concerning the programmatic issues. This includes the setting up of the purchase procedure and sub-contractor contracts.
- a Project Secretary who assists the Project Manager concerning the paperwork, the meeting organisation and the administrative issues.

2.2.4 PA Responsible.

The PA responsible is in charge of leading the PA team whose activities are detailed in 2.3.6 . He/She is responsible of the setting up all the necessary methods and procedures aiming to guaranty that the activities will fulfil the product assurance requirements.

He/She liaises and reports to the Instrument (SPIRE & PACS) PA Managers and to the SAp Project Manager.

2.2.5 Speciality Team Leaders.

Up to 6 specialities have been identified to carry out the developments on SPIRE and PACS projects.

The team leaders are in charge of the co-ordination and the monitoring of the activities of their teams (see §2.3 for activity details).

As far as their activity is concerned, they attend the PACS and SPIRE technical and I/F meetings as well as the reviews at instrument level.

They report to the SAp Project Manager.

2.3 Roles and responsibilities of the teams.

2.3.1 Project Team.

The members of the Project Team are: the Scientific Responsible, the Project Manager, the PA Responsible and the Leaders of each speciality.

The role of this team is to check that the design and developments are kept consistent with the requirements. They discuss and sort out the technical and programmatic issues and make any decisions at system level.

2.3.2 Electronics Team.

The Electronics Team is in charge of the design and development of the Electronics sub-systems for both SPIRE and PACS according to their respective Requirements, I/F and Development Plan.

Members of other Departments of the DAPNIA are participating in this activity:

- the SEDI are in charge of the design and implementation of the SPIRE Subsystem Control Unit as well as the VHDL I/F with the SPIRE DPU.
- the SIS are in charge of the development of the FPU simulators for both SPIRE and PACS instruments.

2.3.3 Mechanics and Cryogeny Team.

The Mechanic and Cryogeny Team is in charge of the design and the development of:

- The PACS and SPIRE electronics boxes.
- The PACS Photometer Focal Plane mechanics and mounting tools in close collaboration with the PACS Detector team, the LETI/LIR (bolometer and cold electronics development and BFPs integration and test) as well as with the SBT (development of the Cryo-cooler).
- The development and setting up and maintenance of the cryogenic test facilities

2.3.4 PACS Detector Team.

The PACS detector team is in charge of the overall design, the development, the test and the characterisation of the PACS Photometer Focal Plane.

This team works in close collaboration with:

- the bolometer development group at LETI.
- the SBT concerning the Cryo-cooler and thermal issues.

2.3.5 Test Equipment and RAIIV Team.

The Test Equipment, Realisation and AIV team is in charge of:

- the development and the commissioning of the electronics ground test equipment (specified by the electronics team). Members of the SIS Department are taking part to this activity as far as the Focal Plane simulators are concerned.
- the realisation and integration of the models.
- the Qualification and Validation works.

2.3.6 Product Assurance Team.

The responsibilities of the product assurance team are the following:

- Writing and maintenance of the PA documents (PAPs, method and procedures, Parts Lists,...)
- Reviews and inspections (documentation, working procedures,...)
- Selection, evaluation and procurement of the electronics parts.
- Configuration and non conformity management.
- Evaluation of radiation effects.
- Incoming inspections.
- Failure Mode Effects and Causes Analysis.

3 Working relationships and mutual commitments.

3.1 CNES and CEA Partnership.

The developments on FIRST under SAp's responsibility are funded by the CEA and the CNES.

The CEA/CNES relationship and mutual commitments are defined in the following documents:

AM1	Accord Cadre CNES/CEA	Signed	03/07/98	CEA/A4516
AM2	Lettre CNES-CEA pour FIRST	Draft	05/09/00	00.190/SAp-LV
AM3	Convention de recherche CEA/CNES	Signed	15/11/01	737/CNES/01/8919/00

3.2 CNES & CEA vs. SPIRE Consortium.

The CNES and the CEA are committed to deliver the equipment described in §1.4.1. to the SPIRE Consortium according to the following Memorandum of Understanding:

AM4	MoU CEA-CNES pour SPIRE	Draft	08/01/01	
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Members of the FIRST SAp team attend the SPIRE meetings as necessary: Consortium meetings, formal reviews, System and Project meetings.

The SPIRE instrument will be integrated at RAL. Therefore, all deliveries will be made to this institute.

3.3 CNES/CEA vs. PACS Consortium.

The CNES and the CEA are committed to deliver the equipment described in §1.4.2 to the PACS Consortium according to the following Memorandum of Understanding:

AM5	MoU CEA-CNES pour PACS	Signed	29/10/01	PACS-ME-LE-005
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Members of the FIRST SAp team attend the PACS meetings as necessary: Consortium meetings, formal reviews, System and Project meetings.

The PACS instrument will be integrated at MPE. Therefore, all deliveries will be made to this institute.

3.4 Collaboration with JPL.

The SAp and the JPL collaborate as far as the readout electronics of the JPL detector are concerned. This collaboration and the worksharing between SAp and JPL is described in the following document:

AM8	MoU CEA-JPL	Signed	10/11/01	SAp-SPIRE-LV-28-01
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3.5 Collaboration with the LETI.

The detector focal plane of the PACS Photometer are based on the Bolometer arrays developed by the LETI.

The collaboration between the CEA/DSM and the CEA/DTA is defined in the following document:

AM6	CEA/DSM-LETI: Convention	Signed	30/10/00	00-161/SAp.JLA
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3.6 Collaboration with the SBT.

The SBT develop and provide the Cryo-cooler for both SPIRE and PACS.

The collaboration between the SAp and the SBT is defined in the following document:

AM9	Business agreement SAp-SBT	Signed	16/10/00	00.166/SAp.JLA
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3.7 Collaboration with the LAM.

The LAM is in charge of the development of the Mechanism Control Electronics, which is to be integrated in the SPIRE Warm Electronics developed by the SAp. The LAM provides the Mechanism Simulator intended to be integrated in the FPU simulator.

The collaboration between the CEA/SAp and the CNRS/IAM is defined in the following document:

AM7	CEA/DSM-LAM-CNES: Convention	Draft 0.3	21/12/00	
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3.8 Collaboration with the CSL.

The CSL is in charge of the development of a subsystem of the PACS electronics interfaced with the electronics developed by the SAp.

The SAp and the SBT collaborate at the definition of the relevant ICDS.

There is no formal agreement beside the work-sharing defined at PACS project level.

3.9 Collaboration with the SEDI Department.

The SEDI are in charge of the development of:

- the design and development of the Subsystem Control Unit which is a part of the SPIRE DRCU.
- the VHDL code of the communication I/F between the SPIRE DPU and the DRCU subsystems.

The collaboration between the SAp and the SEI has been agreed during a Resource Evaluation meeting called by the DAPNIA Resource management group.

AM11	MoU SAp-SEI: CR CER FIRST	Agreed	14/06/00	0G CER R 003-2000
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3.10 Collaboration with the SIS Department.

The SIS are in charge of the development of the FPU simulators required for both SPIRE and PACS. They participate in the Call for Tender elaboration and contractual negotiation for the procurement of cryogenic facilities as well.

The collaboration between the SAp and the SIS has been agreed during a Resource Evaluation meeting called by the DAPNIA Resource management group.

AM10	MoU SAp-SIG: CR CER FIRST	Agreed	14/06/00	0G CER R 003-2000
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3.11 Collaboration with the Commercial Department of the CEA.

Internal CEA/Saclay rules make compulsory the collaboration with the Commercial Department as far as the Call for Tenders and Contract setting up are concerned.

Internal working rules are governing this collaboration.

4 Project Management.

4.1 Project control.

4.1.1 WBS & OBS.

The activities of the Herschel project are identified by a set of WBS:

- Herschel WBS: SAp-FIRST-DR-0043-01
- PACS WBS: SAp-FIRST-DR-0044-01
- SPIRE WBS: SAp-FIRST-DR-0045-01

The organisation set up at CEA/SAp is described by the Herschel OBS:

- SAp-FIRST-DR-0046-01

4.1.2 Product Trees.

- PACS Product Tree: SAp-PACS-DR-0051-01
- SPIRE Product Tree: SAp-SPIRE-DR-0045-01

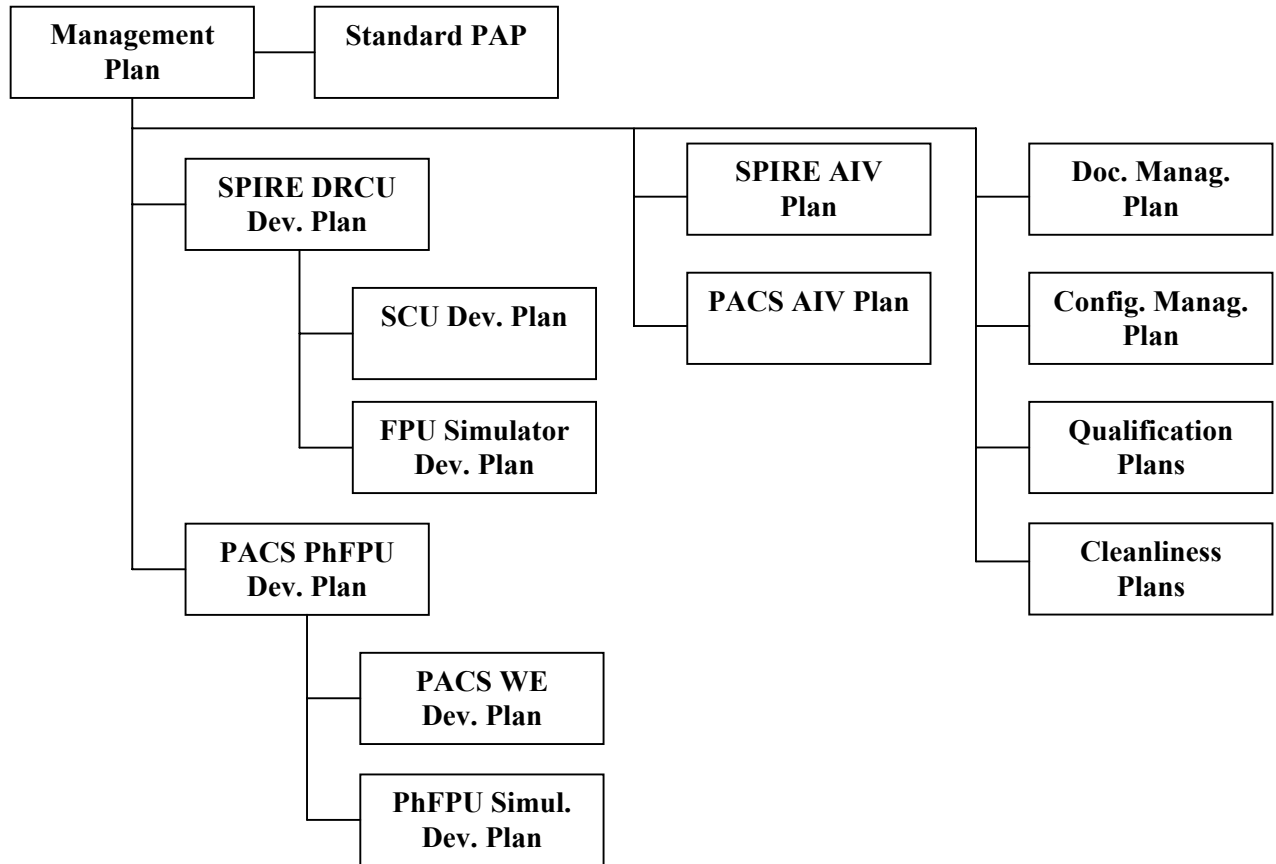
4.1.3 Schedule.

All the project activities are monitored by the mean of consolidated Herschel schedule:

- SAp-FIRST-DR-0047-01

4.1.4 Activity plans.

The structure of the activity plans is the following:



4.1.5 Risk assessment.

Risks are identified and assessed (delays, costs, reliability,...). Proposed solutions are elaborated, evaluated and submitted to SAp project approval.

Risks are collected and kept in the respective Risk analysis documents:

- PACS Risk Analysis Doc.: SAp-PACS-DR-0052-01
- SPIRE Risk Analysis Doc.: SAp-SPIRE-DR-0046-01

4.1.6 Cost control.

Cost control is achieved by the means of budget breakdown and internal ordering procedures.

The budget breakdown is described in the following document:

RF2	Découpage Budgétaire pour FIRST	SAp-FIRST-JLA-0013-00
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4.2 Progress monitoring.

4.2.1 Meetings.

Main Meetings	Instr.	Called by	Freq.	Goals
Science				
HERSCHEL Sc. Team	S/P	ESA Proj. Scientist	2 p.year	<ul style="list-style-type: none"> ➤ Discussion on scientific goals. ➤ Decisions having potential scientific and/or cost impacts.
Working Groups	S/P	Group Leader	4 p.year	<ul style="list-style-type: none"> ➤ Works on dedicated subjects (calibration, ICC,...)
Instruments				
Consortium	S/P	S/P PIs	3 p.year	<ul style="list-style-type: none"> ➤ Review of scientific and technical activities ➤ Definition of the main goals ➤ Instrument Subsystem development co-ordination.
System Management	S/P	Sys. Eng.	Monthly	<ul style="list-style-type: none"> ➤ Progress and co-ordination issues at Inst. level
	S/P	S/P PM	6 weeks + weekly telecon	
CEA				
local Coordination	S/P	SAp PM	2 weeks	<ul style="list-style-type: none"> ➤ Progress and co-ordination issues at CEA development level.
SAp/SBT Progress	S/P	SAp PM	Monthly	<ul style="list-style-type: none"> ➤ Progress and co-ordination issues on Cryo-cooler development.
SAp/LETI Progress	P	SAp PM	Monthly	<ul style="list-style-type: none"> ➤ Progress and co-ordination issues on Bolometer developments

4.2.2 Reviews.

Main Reviews	Instr.	Called by	Freq.	Goals
Reviews				
ESA	S/P	ESA Proj.	1 p.year	<ul style="list-style-type: none"> ➤ ESA Proj. key Reviews (see Milestones) ➤ CNES Proj. key Reviews
CNES	S/P	CNES	1 p.year	
DAPNIA	S/P	DAPNIA	1 p.year	<ul style="list-style-type: none"> ➤ Key Reviews
Instrument	S/P	S/P PM	1 p.year	<ul style="list-style-type: none"> ➤ Instrument development key reviews. ➤ Development reviews. ➤ PA key points
SAp Project	S/P	SAp PM	on demand	
Internal PA	S/P	SAp PA Resp.	on demand	

4.2.3 Reporting.

Who	to	Frequency
Activity team leaders	SAp Herschel Project Manager	Fortnight
SAp Project Manager	SPIRE and PACS Project Managers	Monthly
SAp Project Manager	CNES, CEA	Twice a year
SAp Co-I (or Co-PI)	SPIRE and PACS Consortia	3 per year

4.2.4 Action monitoring.

The Project Action list is kept in a centralised data base by the Project Controller. The content of the Data Base is accessible by the Project team members via the SAp intranet. Action progress reviews are carried out on a regular basis.

4.3 Documentation management.

The Herschel documentation (both internal and external (ESA, SPIRE, PACS)) is stored and regularly updated in a SAp documentation data base. Documents are accessible by the Project team via the SAp intranet.

ESA and SPIRE documentation is accessible via the Web through a Documentation Management System (Livelink).

PACS documentation is accessible via the Leuven web site.

The SAp documentation management is described in the following document:

RH4	Plan de gestion de la documentation	SAP-FIRST-FLo-0002-00
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The documents to be produced by the SAp team are given in the following respective lists:

For SPIRE:

RS4	Liste des documents SPIRE	SAP-SPIRE-FLo-0028-00
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For PACS:

RP7	Liste des documents PACS	SAP-PACS-FLo-0003-00
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