SPIRE/PACS (CEA-SBT)	Monthly Report – March 2005	Date:	April 4th, 2005

SPIRE-SBT-REP-002417

Work Package: Cooler

1. Subsystem Progress Since Project Inception

FM SPIRE unit delivered. FM PACS unit : heat switch to be replaced

2. Subsystem Progress This Month

- ***FM1 (SPIRE)*** : DRB held Nov. 18th 2004. Awaiting comments on EIDP.
- ***FM2 (PACS)*** : Defective switch (pump side – HS#6) has been removed from FM unit. It has been thermally characterized along with a couple of spare switches initially intented for the spare models. The results on HS#6 did not reveal any problem (although we know it is defective !). All available switches have also been geometrically checked (centering aspect). HS#6 is off centered.. These spare switches will undergo a random vibration test (11.5 Grms) shortly, to be followed by a last thermal characterisation. Note that HS#6 will also be vibration tested to check for the evolution of the defect. Selection will be made then - so far HS#5 is foreseen to be used as a replacement in the FM PACS unit (fingers crossed that HS#5 remains OK).
- ***Heat switches*** : New batch of 4 : major problems during the brazing process; all 4 switches defective. A new process has been proposed by the subcontractor to solve the problems and ease the assembling (the subcontractor defends the fact we are at a technological limit, and thus we can succeed in assembling 10 switches and then fail for the following ones). After various meetings with the subcontractor the reasons for the problems may have been identified. It has then been decided (and agreed by CNES) the following :
    - Manufacturing of 5 "standard" heat switches (identical to the current one) and assembly (brazing phase) as before (with minor modification on the tooling used)
    - Manufacturing of 5 "new" heat switches (difference is basically in the play between parts and the addition of a small groove) and use of 3 different brazing solders allowing to perform each brazing in sequence (not simultaneously anymore) and thus for each one take advantage of the gravity (one of the brazing with the current units is done upside down). To validate this new process two representative samples have been manufactured and will be brazed in the coming days.

At the outcome of this program, hopefully we'll have the 4-5 switches required for the future models.

- ***PACS – Level 0 Interface*** : It appears now very likely the solution proposed by SBT (decoupling of mechanical and thermal constraints – see previous PR) will be implemented in the PACS flight instrument. A mock up has been made to look at the thermal aspects : the first results indicate the added contact conductance is very good (≈ 2500 mW/K at 2K with 4 M4 screws) but the strap bulk is limited to 80-100 mW/K. An improved second proto-strap is currently being manufactured. It will be thermally tested again and then delivered to MPE along with the titanium STM equipped with a (working) heat switch. The new level 0 interface will be mounted and the full system will be vibration tested for qualification. The STM will be returned to SBT for investigation (check of HS)
- ***FS*** : thermometers and heaters have been supplied by SAp. The two cooler hearts will be instrumented soon.

3. Problem Areas	Remedial Action
Heat switch brazing process	New process to be validated. Plus current process slightly updated (see above)

4. Engineering Activities

5. Design Changes

If confirmed, minor modifications on heat switch parts (play). New interface for level 0 strap : TBC too.

6. PA/QA Activities

General QA management.

7. Subsystem Management Issues

None

8. Actions Requiring Immediate Attention

SBT documents approval by SPIRE and PACS projects

9. Status of Previous Actions

None

10. Activities Yet to be Achieved

11. Milestones		Status
Mid 2004	FM assembling	Completed
Fall 2004	FM Acceptance program	Completed
Fall 2004	FM1 SPIRE Delivery	Completed
Summer 2005	FM2 PACS Delivery	Cooler to be updated
2005	FS program	On going

12. Schedule Changes