SPIRE/PACS (CEA-SBT)	Monthly Report – February 2005	Date:	February 28th, 2005

SPIRE-SBT-REP-002412

Work Package: Cooler

1. Subsystem Progress Since Project Inception

FM SPIRE unit delivered. FM PACS unit : available for delivery

2. Subsystem Progress This Month

- ***FM1 (SPIRE)*** : DRB held Nov. 18th 2004. Awaiting comments on EIDP.
- ***FM2 (PACS)*** : Last analysis of data to determine the heat flows revealed an anomaly on pump heat switch (degraded OFF position – see test report for further infos). New set of thermal tests have been carried out on FM2 : switch has a bistable mode : "banging" on test cryostat can set the switch in a perfect OFF position or in a degraded position. When the switch is in the correct OFF position, the cooler is operating to spec. New selection process for the future switches being set-up. This FM unit will probably become a FS (TBD if the switch must be replaced). EIDP is being updated following last set of results.
- ***Heat switches*** : New batch of 4 available soon. Selection process : following the tests history on the switches, we are assuming that if a switch is still working properly after a vibration test, then it will remain fine during the subsequent tests. So we propose now to vibration test in one axis and at qualification level (worst level) all future switches (meaning the current available batch and the new one to be available soon). Of course the switches will be thermally characterized before and after the tests, and also as before the geometrical aspects (centering) will be measured. In addition ways to spot the bi-stable mode will be studied. A preliminary design of the interface tool to be used to vibration test the switches has been made : it features the same mounting interface as in the cooler, the snubber and the possibility to add a dummy mass at the I/F switch interface (Level 0 interface).
- ***PACS – Level 0 Interface*** : Following the test on the titanium STM, SBT in agreement with SAp has proposed to modify the interfaces with the level 0 straps. SBT has designed new parts allowing to decouple the mechanical and thermal constraints. Two Vespel parts mounted on the cooler structure (and photometer) mechanically support the large L0 straps, and then lightweight flexible links provide the thermal connection with the switch I/F. Preliminary mechanical modelisation performed at SBT (ANSYS) validate the concept (at least show the induced stress in the parts remain within acceptable limits). The Vespel parts provide a thermal path between the level 0 and Level 1, but the associated thermal load between 1.7 and 4 K has been found to be less than 2 x 100 µW. This solution is a proposition for now : to be discussed with PACS, ESA ?, ….
- Titanium STM : As proposed by SAp all Kevlar strings have been changed and the STM is currently being trained (series of bake out under tension). STM will then be available for potential mechanical tests (interfaces, …)
- ***FS*** : program stopped - on hold : awaiting thermometers and heaters from SAp

3. Problem Areas	Remedial Action
Potential degradation of switch OFF position	Selection process revisited : proposition to add a dedicated vibration test for the switches

4. Engineering Activities

5. Design Changes

PACS Cooler : Although not part of the cooler, SBT proposes a new design for the interfacing with the level 0 straps.

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 – Delivery by SAp of thermometers + heaters for FS units
Decision on new design for L0 interfaces

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
Spring 2005	FM2 PACS Delivery	Cooler available (becomes FS ?)
2005	FS program	On hold (lacking heaters and thermometers)

12. Schedule Changes