Minutes of Meeting

Date:	28.10.2005	**Herschel**	
Doc.-No.:	HP-2-ASED-MN-1104		
Meeting place:	EADS Astrium OTN	Chairman:	D. Hendry
Date/Time:	28.10.2005 / 12:00	Secretary	D. Hendry
Agenda dated:	PTR Standard Agenda	Close of Meeting:	28.10.2005

Subject: PTR for SPIRE IMT

Participants:	A. Aramburu (SPIRE) A.S. Goizel (SPIRE) C. Schlosser (ASED) D. Hendry (ASED) G. Doubrovik (ASP) S. Ilsen (ASD)	Additional Distribution:	ESA ASP

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☐ Brief-Minutes (except following sheets) ☐ Summary of Results of Sheets 2 till

Conclusion:

The SPIRE IMT has been completed, with no outstanding testing.

During the IMT the SPIRE cooler recycle has been verified. The achieved hold time was approx. 40 h

No NCR's as regards operational aspects.

From thermal point of view further investigations are needed to understand the behaviour of the correlation between cryo cover temperature and L1 temperature. A related NCR will be raised.

Reference	Results	Remarks
	PTR Agenda: 1. Introduction 2. Identification of Test Item 3. Review of Procedure Variations / Test Data / Test Reports 4. Review of NCR / RFW Status 5. Open Work / Open Actions 6. Conclusion	

Reference	Results	Remarks
	1. Introduction This PTR covers the 2nd part SPIRE IMT which has been conducted in CW 43. The related TRR minutes are HP-2-ASP-MN-6975. Note: 1st part of SPIRE IMT has been conducted in CW 39. After two unsuccessful cooler recycles it has been decided to interrupt the SPIRE IMT and to undertake recovery actions as described in the related NCR ASDE-NC-1513 (see below). See Interim PTR HP-2-ASED-MN-1067. Meanwhile these recovery actions have been undertaken. **2. Identification of Test Item** **Configuration of SPIRE H/W and S/W** See HP-2-ASED-MN-1061. No change during SFT He II / IMT. **Configuration of facility** The cryostat hardware status is same as during the 1st part of the SPIRE IMT with the exception that • The filling port interface to the CVV has been tightened with glue (RTV 691) • The HTT has been depleted and evacuated and will remain evacuated during future tests. The heat shields are cooled instead by helium flushing from external dewar with 150 mg/s to 250 mg/s. • The cover flushing is also performed by external dewar with a variable flow rate. The temperatures are adjusted by throttling at the transfer line valve and adjusting the dewar pressure.	

Reference	Results	Remarks
	3. Review of Procedure Variations / Test Data / Test Reports Several tests could be skipped. Other tests have been extended, e. g. gathering of thermal data with different temperature conditions for cryo cover, L1 , etc.: – 1st test at low temperatures: AXT at about 1.65 K, L0 at about 1,7 K, L1 temperatures achieved about ~6K (by high flow rate through AXT/OBA of 25 mg/s), cover below 13 K (estimated 5 K) - however due to He supply problems there was no shield cooling, 1st shield temperature was ~65 K – 2nd test with cover at ~80 K: AXT at about 1.65 K, L0 at about 1,7 K, L1 temperatures achieved about ~6K (by high flow rate through AXT/OBA of 25 mg/s), cover at ~ 75 K (nearly stable), 1st shield temperature was ~25 K – 3rd test at "high" temperatures: AXT at about 1.65 K, L0 at about 1.7 K. Heating of the AXT to achieve higher temperatures at the AXT increased the flow through AXT/OBA to ~45 mg/s. Therefore the L1, L2 and L3 temperatures were lower than at the last tests (5K,10K). Cover at ~ 80 K (nearly stable), 1st shield temperature was ~25 K Quick look analysis of the noise test data has revealed a slightly higher noise (~30-40 nV/Hz$^{1/2}$) cf (~20-30 nV/Hz$^{1/2}$) that during dark CQM ILT conditions. The source of this “extra” noise is still under investigation with the rest of the test data gathered during the bolometer load curves. Test report: For operational aspects: HP-2-ASED-TR-0101, dated 28.10.2005. For performance and thermal aspects SPIRE will establish dedicated reports following completion of their off-line analyses.	

Reference	Results	Remarks
	4. Review of NCR / RFW Status The NCR status prior to test is as per HP-2-ASED-MN-1061. The following NCR's have been updated: <u>ASED-NC-1513: SPIRE EQM Cooler recycling</u> Status after leak rate investigations at the cryostat (see HP-2-ASED-SD-0058 for details): – filling port / CVV I/F tightened with glue RTV 691 (improvement of a factor of 10 in leak rate) – HTT depleted and warmed up to 30 K – HTT pumped down, current pressure is 0.19 bar due to warming up of cold gas (improvement of a factor of 10 in leak rate) – Shield cooling with external dewar with a flow rate of about 200 mg/s – AXT filled with LHe II and evaporating through OBA (as before) – Total leak rate at IMT conditions ~ 1 x 10^{-6} mbarl/s (measured behind turbo pump) NCR open. The following anomalies have been detected: <u>Unexpectedly high correlation between cryo cover temperature and SPIRE L1 temperature</u> Cause is currently not understood and needs to be investigated by SPIRE. Problem will be tracked by NCR although no existing requirement is affected. The NCR will be closed as soon as the cause of this anomaly has been identified. <u>Other anomalies</u> Analysis of this week data will be required before being able to confirm whether any additional NCRs are applicable.	

Reference	Results	Remarks
	SPIRE NCR's Same as before. **5. Open Work / Open Actions** The following items need to be resolved prior to PACS SPIRE Parallel Mode IMT • Establish together with PACS what is the optimum cryo cover temperature for these tests. The following items need to be resolved prior to SPIRE EMC test • SPIRE state that stable cryostat temperatures (shield1, cover) temperatures are required. A cold cover temperature (<10K) would be needed if straylight problems are affecting SPIRE. Note: This statement to be assessed and commented by ASED, ASP and ESA. • NCR's to be processed. **6. Conclusion** The SPIRE IMT test sequence has been completed. The preliminary results of the performance test data analyzed show no major discrepancies with the ILT behaviour although some aspects (background and its impact in the bolometer performance) are still to be investigated. Some of the tests requiring a highly stable cryostat environment, noise tests in particular needed to be shortened due to the sometimes unstable thermal conditions as a result of cryo operation and	

Reference	Results	Remarks
	flushing with dewar configuration. This situation was improved towards the end of the test week. No outstanding IMT testing is envisaged. During the IMT the SPIRE cooler recycle has been verified. The achieved hold time was approx. 40 h No NCR's as regards operational aspects. From thermal point of view further investigations are needed to understand the behaviour of the correlation between cryo cover temperature and L1 temperature. A related NCR has been raised.	

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Action Items List

No.:	Description:	Due Date	Originator Comp./Pers.	Actionee Comp./Pers.	Source	Completion