Minutes of Meeting

Date:	30.09.2005	**Herschel**	
Doc.-No.:	HP-2-ASED-MN-1067		
Meeting place:	EADS Astrium OTN	Chairman:	D. Hendry / S. Idler
Date/Time:	30.09.2005 / 12:00	Secretary	S. Idler
Agenda dated:	PTR Standard Agenda	Close of Meeting:	30.09.2005

Subject: Interim PTR for SPIRE IMT

Participants:	S. Sidher (SPIRE) S. Ilsen (ASED) S. Idler (ASED) C. Schlosser (ASED) D. Hendry (ASED) G. Doubrovik (ASP)	Additional Distribution:	ESA ASP

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

Conclusion:

The SPIRE SFT He II has been successfully performed with no NCR. During the following IMT the SPIRE cooler recycle did not achieve the required evaporator temperature to carry out meaningful performance tests. In the frame of the related NRB it has been agreed that SPIRE IMT is interrupted now. Prior to restart the cooler recycle problem has to be resolved. The way forward is detailed in the related NCR ASED-NC-1513.

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	

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Reference	Results	Remarks
	1. Introduction This Interim PTR covers the SPIRE tests carried out during CW 39/2005. The related TRR minutes are HP-2-ASED-MN-1061. The following activities have been performed: 26.09.2005 SPIRE SFT He II. Ok Start SPIRE IMT (perform steps 2 and 3 of SPIRE-RAL-NOT-002284, issue 2.2). Ok Power on HIFI and PACS and switch to stand-by. Perform SPIRE cooler recycle. Evaporator temperature does only reach below 340 mK. ASED-NC-1513 raised. Switch SPIRE to stand-by. Check PACS/SPIRE HK data records. Ok. All instruments left in stand-by during night. 27.09.2005 Check HIFI/PACS/SPIRE HK data records. Ok. Start pumping of isolation vacuum to assist cooler recycling. Start SPIRE cooler recycle. Cooler temp reached 318 mK and stabilised after 30 min on 355 mK. Switch SPIRE to stand-by. Start to convert to He I (AXT) Check PACS/SPIRE HK data records. Ok. All instruments left in stand-by during night. 28.09.2005 Check HIFI/PACS/SPIRE HK data records. Ok. Start conversion back to He II (AXT) Check PACS/SPIRE HK data records. Ok. All instruments left in stand-by during night.	

Reference	Results	Remarks
	29.09.2005 Check HIFI/PACS/SPIRE HK data records. Ok. Start SPIRE cooler recycle. Cooler temp reached 384 mK and stabilised after 1 h on about 350 mK. This temperature was stable for 4 h. Switch SPIRE to stand-by. Check PACS/SPIRE HK data records. Ok. All instruments left in stand-by during night. After the second unsuccessful cooler recycle 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). **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** See HP-2-ASED-MN-1061. The cryostat is tilted by 23.5 deg to y direction. During test the AXT has been temporarily warmed up to He I conditions for cooler temperature problem investigation purposes (ASED-NC-1513). **3. Review of Procedure Variations / Test Data / Test Reports** For SFT He II: No procedure variations. The test data showed nominal values. The test report is HP-2-ASED-TR-0095	

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	2-ASED-TR-0095. For IMT: The first 2 test steps have been done with the other instruments in off mode (due to optimise the test schedule). Cooler recycle has been done twice followed by diagnostic tests. Since the required low and stable evaporator temperature could not be achieved the IMT has been aborted. Details are given in the test report HP-2-ASED-TR-0096 (under preparation) and the related NCR (ASED-NC-1513). **4. Review of NCR / RFW Status** The NCR status prior to test is as per HP-2-ASED-MN-1061. The following new NCR's have been raised during the test: ASED-NC-1513: SPIRE EQM Cooler recycling The first SPIRE cooler recycling performed on 26.09.05 only achieved a temp of appr. 0.420K and a hold time of less than 3 hrs. A second recycle was tried on 27.09.05 after the cryostat had been pumped/evacuated for 3 hrs. The air lock had been closed for appr. 10 days when the PLM was moved to the tilting dolly prior to the start of IMT. Pump was still running following the reintegration. The leak detection was 10-4mblt/sec. The second recycle achieved a temp of 0.328K but this is not sufficient for performance tests. 27.09.05 NRB ESA,ASP,ASED,RAL: SPIRE consider that IMT cannot continue until cooler recycling can be successfully performed and a temp below 0.300K can be achieved. The possible causes of the failure were identified as follows. 1) He 4 leak causing a He film on the detector surface. This was seen during ILT and the temp was	

Reference	Results	Remarks
	increased to 4.2K to remove the film and was successful in achieving a good recycling and hold time. 2) He 3, problem with strap or heat switch. The NRB agrees 2 parallel actions. AI/1 SPIRE to analyse the load curves to investigate problems of strap and heat switch AI/2 ASED to heat up AXT to 4.2K and continue pumping for 24 to 36 hrs (till 29.09.05 morning) to remove the He film from the detector and evaporator surfaces and remove the He. Vacuum and leak detection will be monitored. Temperature, vacuum and leak detection values will be assessed prior to a further cooler recycle on 29.09.05 AM, the results of this test will be discussed in a follow on NRB to be reconvened after the test. 29.09.05 follow on NRB ESA,ASP,ASED.RAL Following the warm up to 4.2K and pumping for 36 hrs (20hrs at AXT temp 4.2K + 16hrs during cool down of AXT to 1.6K) a 3rd cooler recycle was performed with the following conditions. Evaporator temp 1.75K Cover temp app 10 K Vacuum 1.5x10-7 Back ground leak rate 1.3x10-4 During recycling after 2.5 hrs the cooler temp was 0.284K Temp started to rise and was 0.318K after 1 hr (temp plots will be attached to the NCR) SPIRE consider this is not acceptable to continue with IMT. The NRB considers that the heat transfer is caused by free He flow between cold and warm surfaces which causes a film to form on the detectors and evaporator. This free He probably comes from the know leak on the filling port I/F into the CVV and has also saturated the absorbers at the bottom of the main tank. The NRB considered that the leak tightness of the filling port/CVV I/F could be improved by inserting a glue at this I/F. For this activity the airlock and the pressure plate has to be removed and the He SS has to be closed by a dummy plug in the filling port instead of the SV121.	

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Reference	Results	Remarks
	ASED say it is not certain that the gluing of the I/F will have an effect on the leak tightness. ASED advise that due to the isolation vacuum there is a risk during the rework operation. For the proposed rework ASED will provide a detailed drawing of the I/F and plug and will identify the materials and procedure to be used AI/ASED 30.09.05. In an attempt to remove the He film and the free He within the cryostat(and instruments) the AXT will be depleted and warmed to above 20k with continual pumping. The warm up/cool down and filling port I/F rework is estimated to take 1 week. It is also considered that even with the warm up and rework there is still the possibility that as the absorbers are saturated not all the free He will be removed and could still have an effect on the cooler hold time and operation. ASP will review the load curves and temperature profile of the recycling and provide an analysis. AI/ASP 29.09.05 Follow on investigations to measure the leak rate. A mass spectrometer has been connected to the airlock SV922. The turbo pump is still running but the backing valve behind the pump is closed (ie, turbo pump not effective). The measurements from the mass spectrometer are the following. Hydrogen =1.6*10-9 He3 =1.3*10-12 He4 =1.0*10-9 Water=1.9*10-8 N2=6.5*10-9 O2=1.4*10-9 The results will be assessed by ASED cryo engineering. NCR open.	

Reference	Results	Remarks
	5. Open Work / Open Actions The following items need to be resolved prior the SPIRE IMT can be continued. • Cooler recycling (ASED-NC-1513) The following test steps of the SPIRE IMT have still to be performed (based on SPIRE hourly planning as per SPIRE-RAL-NOT-002284, Issue: 2.2, dated 21 Sept 2005): • All starting from step 4 to step 54. This sums up to about 5 further days. **6. Conclusion** The SPIRE SFT He II has been successfully performed with no NCR. During the following IMT the SPIRE cooler recycle did not achieve the required evaporator temperature to carry out meaningful performance tests. In the frame of the related NRB it has been agreed that SPIRE IMT is interrupted now. Prior to restart the cooler recycle problem has to be resolved. The way forward is detailed in the related NCR ASED-NC-1513.	

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Action Items

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

	Name	Dep./Comp.		Name	Dep./Comp.
	Alberti von Mathias Dr.	AOE22		Sonn Nico	AOE51
	Barlage Bernhard	AED11		Steininger Eric	AED44
	Bayer Thomas	AOA52	X	Stritter Rene	AED11
	Brune Holger	AOA55		Thörmer Klaus-Horst Dr.	OTN/AED65
	Fehringer Alexander	AOE13		Wagner Klaus	AOE22
X	Fricke Wolfgang Dr.	AED 65	X	Wietbrock Walter	AET12
	Geiger Hermann	AOA52		Wöhler Hans	AOE22
	Gerner Willi	AED11		Wössner Ulrich	ASE442
	Grasl Andreas	OTN/AOA54			
	Grasshoff Brigitte	AET12			
	Hauser Armin	AOE22			
X	Hendry David	Terma Resid.			
	Hengstler Reinhold	AOA 5			
	Hinger Jürgen	AOE22	X	Alcatel	ASP
	Hofmann Rolf	ASE442	X	ESA/ESTEC	ESA
	Hohn Rüdiger	AED65		**Instruments:**	
	Huber Johann	AOA52		MPE (PACS)	MPE
	Hund Walter	ASE442	X	RAL (SPIRE)	RAL
X	Idler Siegmund	AED432		SRON (HIFI)	SRON
X	Ilsen Stijn	Terma Resid.		**Subcontractors:**	
	Iványi von András	FAE22		Air Liquide, Space Department	AIR
	Jahn Gerd Dr.	AOE22		Air Liquide, Space Department	AIRS
	Kalde Clemens	APE3		Air Liquide, Orbital System	AIRT
	Kameter Rudolf	OTN/AOA54		Alcatel Bell Space	ABSP
	Kettner Bernhard	AET42		Astrium Sub-Subsyst. & Equipment	ASSE
	Knoblauch August	AET32		Austrian Aerospace	AAE
	Koelle Markus	AOA53		Austrian Aerospace	AAEM
X	Kroeker Jürgen	AED65		APCO Technologies S. A.	APCO
	Kunz Oliver Dr.	AOE22		Bieri Engineering B. V.	BIER
	Lamprecht Ernst	OTN/ASI21		BOC Edwards	BOCE
	Lang Jürgen	ASE442		Dutch Space Solar Arrays	DSSA
	Langenstein Rolf	AED15		EADS CASA Espacio	CASA
	Langfermann Michael	AOA51		EADS CASA Espacio	ECAS
	Mack Paul	OTN/AOA54		EADS Space Transportation	ASIP
	Müller Jörg	AOA52		Eurocopter	ECD
	Müller Ralf	FAE22		European Test Services	ETS
	Peltz Heinz-Willi	AOE13		HTS AG Zürich	HTSZ
	Pietroboni Karin	AED65		Linde	LIND
	Platzer Wilhelm	AED22		Patria New Technologies Oy	PANT
	Reichle Konrad	AOA52		Phoenix, Volkmarsen	PHOE
	Reuß Friedhelm	AED62		Prototech AS	PROT
X	Rühe Wolfgang	AED65		QMC Instruments Ltd.	QMC
	Runge Axel	OTN/AOA54		Rembe, Brilon	REMB
	Sachsse Bernt	AED21		Rosemount Aerospace GmbH	ROSE
	Schink Dietmar	AED44		RYMSA, Radiación y Microondas	RYM
X	Schlosser Christian	OTN/AOA54		SENER Ingenieria SA	SEN
	Schmidt Rudolf	FAE22		Stöhr, Königsbrunn	STOE
	Schweickert Gunn	AOE22		Terma A/S, Herlev	TER