PROJECT: SPIRE	**MINUTES OF MEETING**	**Doc. No:** SPIRE-RAL-MOM-000619 **Date: 3-April-2001** **No. of Sheets: 8**

Subject: SPIRE AIV – Kick Off Meeting with AS Scientific

Meeting Place: RAL Date / Time: 3-April-2001 10:30 Agenda Dated:		Chairman: D.L.Smith Secretary: Close of Meeting: 14:30
PARTICIPANTS		**ADDITIONAL DISTRIBUTION**
D.L.Smith (RAL) M.Harman (RAL) Sam Heys (RAL) Eric Clark (RAL) Martin Caldwell (RAL) Colin Hilier (AS Scientific) Beth Evans (AS Scientific)	Kevin Ayres (Stainless Metalcraft) Martin Lawrence (Stainless Metalcraft)	

Agenda:

1. Introductions
2. Agree Agenda
3. Technical Discussion to Include
   - Thermal Design
   - Mechanical
   - Optical Interfaces
   - Electrical Interfaces
4. Quality Assurance
5. Schedule
6. AOB

Attachments:

1. Proposed location of cryostat temperature sensors

2. Draft requirements for acceptance data package

Action / Comment Number	Short Title	Action (A), Recommendation (R), Decision (D), Observation (O)	Action / Ref. with:	Action Deadline
	Cryostat Responsibilities	Stainless Metalcraft will build the outer vacuum vessel. AS Scientific will be responsible for the internal elements of the cryostat and are the technical point of contact to RAL.		
	Vacuum Vessel	Stainless Metalcraft needed to clarify the critical interfaces to progress the design of the outer vacuum vessel, in particular the optical ports and low conductivity support feet. They are also concerned about the temperature and pressure ranges of the vessel. Filter interfaces will be fine machined after main manufacture to specified flatness. QMW should provide O-ring in optical window mount		

Action / Comment Number	Short Title	Action (A), Recommendation (R), Decision (D), Observation (O)	Action / Ref. with:	Action Deadline
A-01	**Update Drawings**	Mark Harman to iterate current provisional drawings to a formal issue. The support feet will take the force of the support frame plus the instrument ~ 150kg. The 9K radiation shield will be supported from the top of the tank. He cans will be supported from the top of the tank N2 shield support is TBD. AS Scientific to decide how best to support this shield.	MH	05/04/2001
A-02	**Position of feedthroughs**	Review position of electrical feedthroughs. For the cryostat operations CH suggested approximately 6 temperature sensors and 4 heaters for each flexible hose to ensure that the N2 is efficiently removed after pre cooling. The eventual number of sensors will depend on the design. SH presented initial results of cooldown analysis. These showed a cooldown period of 170 Hours! Most of this time was for cooling to 77K. After this the cooldown was much more rapid due to the low heat capacity at low temperatures. Concern was raised about thermal shocks.	MH/DS	05/04/2001

Action / Comment Number	Short Title	Action (A), Recommendation (R), Decision (D), Observation (O)	Action / Ref. with:	Action Deadline
A-03	**Temperature Gradients**	Ask MSSL about the acceptable temperature gradients across SPIRE The vacuum vessel will run at 300K and should cope with 0.5bar above atmospheric pressure. The vessel should conform to BS5500 Stainless Metalcraft use AutoCAD. It is possible for them to generate dxf output. AS to propose a method for attaching temperature sensors. AS will supply the temperature sensors. CERENOX sensors are NOT essential Interfaces for the instrument electrical harness are still open. AS will provide connectors for all temperature sensors and heaters. A provisional list of sensors is given in attachment A. SH noted that the 9K shield will be required to operate over a range of temperatures from 9K to 15K. A heater will be required for the boil-off to control the 10K shield.	SH	

Action / Comment Number	Short Title	Action (A), Recommendation (R), Decision (D), Observation (O)	Action / Ref. with:	Action Deadline
		The thermal model assumes 1.7K interface to the cooler. The current cryostat design will only give an estimated 2-2.2K.		
A-04	**Interface Temperatures**	Investigate the effect of a 2.2K interface to SPIRE. Is this acceptable?	SH	
A-05	**Hydroblast Spec**	AS will ensure that the vacuum vessel is cleaned on arrival. CH to send MH a copy of the Hydroblast cleaning spec.	CH	
	Quality Assurance	Eric Clark gave an overview of the documentation that is expected by the project. AS are not ISO-9000 accredited but have other QA procedures in place. On completion of the work by Stainless Metalcraft, Richard Day will accept the vacuum vessel and it will become property of CLRC under AS Scientific's care.		
	Schedule	The scheduled delivery date for the cryostat is the end of November 2001. This is dependent on A-01 being completed on time.		

SPIRE Cryostat Temperature Sensors

26-03-01

Sam Heys

Ref. No.	Location		No.Off	*Min Temp Required (K)*	Temp Range (K)		Cold Temperature Accuracy (+/- K)
					min	max	
1	70K Shield	Endcap 1	1	*70*	60	325	1
2		Endcap 2	1	*70*	60	325	1
3		Filter Flange	1	*70*	60	325	1
4	9K Shield	Inlet Pipe	1	*8*	4.2	325	0.1
5		Outlet Pipe	1	*8*	4.2	325	0.1
6		Endcap 1	1	*8*	4.2	325	0.1
7		Endcap 2	1	*8*	4.2	325	0.1
8		Cylinder End 1	1	*8*	4.2	325	0.1
9		Cylinder Centre	1	*8*	4.2	325	0.1
10		Cylinder End 2	1	*8*	4.2	325	0.1
11		Filter Flange	1	*8*	4.2	325	0.1
12	9K Support Frame	Vacuum Vessel Standoff 1	1	*8*	4.2	325	0.1
13		Vacuum Vessel Standoff 2	1	*8*	4.2	325	0.1
14		Vacuum Vessel Standoff 3	1	*8*	4.2	325	0.1
15		Vacuum Vessel Standoff 4	1	*8*	4.2	325	0.1
16	9K Interface Plate	Phot JFET Enclosure	1	*8*	4.2	325	0.1
17		Spec JFET Enclosure	1	*8*	4.2	325	0.1
18		FPU Foot 1Interface	1	*8*	4.2	325	0.1
19		FPU Foot 2 Interface	1	*8*	4.2	325	0.1
20		FPU Foot 3 Interface	1	*8*	4.2	325	0.1
21		Harness Sink - RF Filters	1	*8*	4.2	325	0.1
22		Harness Sink - Phot JFET	1	*8*	4.2	325	0.1
23		Harness Sink - Spec JFET	1	*8*	4.2	325	0.1
24	4K Stage	Vessel Top	1	*3*	1.4	325	0.05
25		Vessel Bottom	1	*3*	1.4	325	0.05
26		FPU Level 1 Strap interface	1	*3*	1.4	325	0.05
27	2K Stage	Vessel - Bottom	1	*1.6*	1.4	325	0.01
28		FPU Box Strap interface	1	*1.6*	1.4	325	0.01
29		FPU Pump Strap interface	1	*1.6*	1.4	325	0.01
30		FPU Evap Strap interface	1	*1.6*	1.4	325	0.01
TOTAL NUMBER OF SENSORS:			30				

FOR COMMENT

Draft List of requirements and responsibilities.

SECT	CONTENTS	REQ D.	Responsibility	COMMENTS
1	Shipping Documents	Yes	Contractor	
2	Procedures for Transport Handling and Installation	Yes	Contractor	
3	C of C / Delivery Review Board MOM AI-Lists	Yes	Contractor	
4	Qualification Status List / Test Matrix			
5	Top Level Drawings (inc. Family Tree)			
6	Interface Drawings			
7	Functional Diagrams (Block Diagram)			
8	Electrical Circuit Diagrams			
9	As Built Configuration Status List			
10	Serialised Components List			
11	List of Waivers			
12	Copies of Waivers			
13	Operational Manual			
14	Historical Record			
15	Logbook / Diary of Events			
16	Operating Time / Cycle Record			
17	Connector Mating Record			
18	Age Sensitive Items Record			
19	Pressure Vessel History / Test Record			

20	Calibration Data Record			
21	Temporary Installation Record			
22	Open Work / Deferred Work / Open Tests			
23	List of Non-Conformance Reports			
24	Copies of Non-Conformance Reports			
25	Test Reports			
26	Proof Load Certificates			
27	Reference List of Lower Level ADP's			
28	Mass Records / Power Budget			
29	Cleanliness Statement			
30	Other Useful Information: *Compliance Matrix			
31	Delivery Schedule (to Include reviews & inspection	Yes	Contractor	
32	Configuration control of drawings.			
33	DO to follow ISO9000 RAL Processes 1987			
34	RAL Goods in inspection