

FIRST SPL COLLABORATION MEETING

11-12 December 2008

Working Group on

CRYO-MODULES DESIGN AND INTEGRATION **(design, construction, assembly...)**

GOALS:

1. Understand limits of scope of CEA and CNRS contributions
2. Identification of integration needs: components type, interfaces, functional needs (ex.cooling power HOM)
3. Identify uncovered items and possible distribution to institutes interested
4. Define list of topics towards a functional specification: alignment requirements, thermal budgets (static+dynamic), mechanical requirements
5. Define input for mechanical layouts, cryogenics specs (pressures & temperatures)
6. Define the key ingredients for defining a layout for tunnel interfaces: longitudinal layout, interconnect space, coupler layout (vertical, lateral?)
7. Elaborate a work organization structure

Planned talks:

1. General overview (V.Parma): 10'+5'
2. French contributions under the collaboration agreement (CNRS/P.Duthil, CEA/S.Chel?): 2x(10'+5')
3. Possible quadrupole solutions (D.Tommasini, CERN): 10'+5'

Issues to be discussed:

1. Type of coupler, integration needs, mechanical interface
2. Type of tuner, integration needs, interface to cavity helium vessel
3. Magnetic shielding design & integration (internal? external?)
4. Quadrupole magnets: requirements, possible solutions
5. Alignment requirements and assembly principles
6. cryogenics distribution architecture: general requirements and possible schemes, slope, H/W related issues (ex. Valve boxes)
8. Mechanical and vibration studies. 4.5 K perturbations
9. thermo-mechanical simulation studies: cool-down/warm-up transients
10. testing instrumentation: cryo, mechanical vibrations...

#	Task Description	Interested institute	Deadline/comment
1	Cryostat design and integration and procurement of cryostat components for 1 prototype cryo-module	CNRS	French contribution
2	Design and procurement of the supporting/guiding system for the string of cavities in the cryostat	CNRS	French contribution
3	Design and procurement of 2 helium vessels for cavities $\beta=0.92$.	CEA	French contribution
4	Design and procurement of cryostat assembly tooling	CEA	French contribution
5	Design of quadrupole package	CERN	Required for prototype
6	Design of current leads for quads	CERN	Required for prototype
7	Definition of clean room assembly procedures and design of tooling	TBD	Required for prototype
8	Design of cryomodule interconnections (expansion joint systems, external bellows...)	TBD	
9	Prototype instrumentation and diagnostics (T measurements, survey alignment measurements, vibrations ...)	TBD	
10	Vibration studies (4.5 K perturbations, thermal shield cooling lines...).	TBD	
11	Thermo-mechanical cool-down/warm-up transient studies	TBD	
12	Advantages of introducing a second active thermal screen (thermal study, engineering complexity and cost)	TBD	
13	Design of Technical Service Module for cryo-module testing	TBD	Required for prototype

