

Spectrometer Solenoid Schedule

September 13th 2011

Roy Preece



Science & Technology
Facilities Council

Sections

- Construction
 - Cold Mass – Reworking for the additional cryo coolers, resistor conduction, fill / vent tubes.
 - Cooler Towers – Reworking for the additional cryo coolers, flanges and access ports.
 - Instrumentation – New sensors, harness and feedthroughs. External cabling and hardware.
 - MLI – Focus on each part to be insulated.
- Assembly
 - Sequential process for assembly with control points for quality checking.
- Testing
 - Cool down, instrumentation, magnetic training and mapping.
- Shipping / Integration
 - Method of packing and shipping to RAL.



Construction

- Conservative estimates for timescales
 - _ Estimate from previous experience of the construction
 - _ Slack included in the estimate.
- Risk
 - _ Quality checks – MLI, instrumentation...etc
 - _ Periodic review – MICO, Collaboration Meetings, MAP PMG, in house meetings
 - _ Documentation / Drawings / Models / Pictures
- Parallel work
 - _ Personnel and work space an issue.
 - _ Instrumentation, MLI, documentation, models and drawings.
 - _ Vacuum Vessel and Radiation shield



Assembly / Test

- Sequence of assembly
 - Utilising the crane structure and support beam.
 - Working space.
 - Only one magnet at a time.
- Cool down and Test
 - Initial cooldown – semi automated LN2 cooling
 - He fill
 - Run the cryo coolers and stabilise - 3 days
 - Limit to 1 quench / day and then stabilise again
 - Continue until stable running of coils and cryo coolers – at least 24h continuous running
 - Characterise using heaters
- Magnet mapping
 - Can be carried out when stable operations can be replicated.



Shipping / Integration

- Shipping / Integration
 - Sea Cargo
 - Pack into open topped shipping container, 20'.
 - Lift in and out from top
 - Truck overland to New York / Ship to Folkestone
 - Ship all parts of the magnet system together
 - Air Freight
 - Special cargo plane
 - Expensive
 - Just the Magnet, coolers, compressors..etc separately
 - Ship without the stand welded to the vacuum vessel
 - Reduces height
 - Possibly eases integration issues – Bolted arrangement.
 - Discussions with RAL team.



Milestones

- Major milestones taken from current schedule
 - Upstream Spectrometer Solenoid
 - Cold Mass ready for assembly – 3rd October
 - Upstream and Downstream Radiation Shields ready for installation – 4th October
 - Vacuum Vessel ready to start assembly – 22nd September (Complete)
 - Assembly starts – 4th October
 - Cold Mass Aligned to Vacuum Vessel – 2nd November
 - Vacuum Vessel closed – 22nd December
 - Ready for training – 9th January 2012
 - Ready to Ship – 13th February
 - Arrival at RAL – 26th March
 - Downstream Spectrometer Solenoid
 - Cold Mass lifted onto beam – 2nd November
 - Assembly starts – 21st December
 - Cold Mass Aligned to Vacuum Vessel – 16th February
 - Vacuum Vessel closed – 9th March
 - Ready for training – 13th April
 - Ready to Ship – 25th May
 - Arrival at RAL – 3rd July

