

SMC: rational and history

Gijs de Rijk
Cern

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SMC as NED phase 1.5



- 3 FP6-CARE-NED partners CEA, CERN & RAL + LBNL started the informal project Short Model Coil beginning 2007
- Aim: build a small, limited resources, racetrack magnet as successor to NED , awaiting a larger new initiative (FP7-EuCARD)
- Roles:
 - Project leaders: A. Devred and after 5 months G. de Rijk
Afterwards M. Bajko and since 2 years J-C. Perez
 - design CEA, RAL, CERN, LBNL
 - Structure manufacturing CEA
 - Coil manufacturing RAL, CERN
 - Assembly CERN
 - Test CERN
- Planned SMC coil assemblies in 2007
 - SMC1 14 strand cable, 1.25 mm Alstom IT strand, RAL insulation
 - “classical route”
 - SMC2 14 strand cable, 1.25 mm Alstom IT strand, ceramic insul.
 - “innovative route”

SMC1



- The original design was reported in 2 reports (on CERN CDS)
 - Mechanical Design of the SMC (Short Model Coil) Dipole Magnet / Regis, F (CERN) ; Manil, P (CEA) ; Fessia, P (CERN) ; Bajko, M (CERN) ; de Rijk, G (CERN) , EuCARD-PUB-2009-005. - 2009.
 - Magnetic Design and Code Benchmarking of the SMC (Short Model Coil) Dipole Magnet / Manil, P (CEA) ; Regis, F (CERN) ; Rochford, J (RAL) ; Fessia, P (CERN) ; Canfer, S (RAL) ; Baynham, E (RAL) ; Nunio, F (CEA) ; de Rijk, G (CERN) ; Védrine, P (CEA) , EuCARD-PUB-2009-004. - 2010

SMC and EuCARD-Fresca2



- When EuCARD-WP7-HFM was started in 2009, the need for an SMC step in the Fresca2 construction was clearly identified (experience at LBNL)
- The SMC project was partly ‘annexed’ into EuCARD
- Aim of SMC in EuCARD:
 - Learn to make coils and structure. Get experience with Nb₃Sn
 - Certify manufacturing procedures for the EuCARD-Fresca2 magnet
- Planned Fresca2 preparation SMCs from 2009 (the numbering was changed)
 - **SMC1** cable: 14 strand, 1.25 mm Alstom IT
 - **SMC3** cable: 14 strand, 1.25 mm EAS-Bruker PIT
 - SMC4 cable: 18 strand, 1.00 mm EAS-Bruker PIT
 - SMC5 cable: 40 strand, 1.00 mm EAS-Bruker PIT: “Fresca2” cable
(the numbering from SMC4 onwards has changed again since)
- The SMC2 (Ceramic) stayed outside EuCARD

This review



Question to the reviewers:

- Is SMC the correct way for preparing the Fresca2 magnet project ?
- What is eventually missing in the SMC program ?

Taking into account that SMC is not the core of the EuCARD project, and that we are already late : we have announced to the EC that, at the official end of EuCARD (April 2013), only one FRESCA2 coil will be tested, and that the full dipole will be tested only at the end of 2013 (main deliverable of task 3)

- Are there improvements to be done for SMC3b and further (the next ones to be built) ?