Task 3: High field model

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DOW task 7.3

Task 3. High field model

- Design, build and test a 1.5 m long, 100 mm aperture dipole model with a design field of 13 T using Nb_3Sn high current Rutherford cables.

Task 3. High field model

The technologies to be used for Nb_3Sn magnets, which are residing with the partners (e.g. high current density conductors, Nb_3Sn wind-and-react coil fabrication, insulation) are to be brought together and tested in short models. Several of these technologies (superconducting cable, insulation, coil design, support structures) were partly developed during the FP6-CARE-NED project.

The proposed dipole model will test these technologies for large accelerator magnets and the model will afterwards be used to upgrade the superconducting cable test facility FRESCA at CERN from 10 T to 13 T. The issues are to reach high fields in large apertures with good temperature margins in the coil, beyond the possibilities of Nb-Ti conductors.

As a test bed for high field accelerator magnets a 1.5 m long dipole model will be build with an aperture of 100 mm and a design field of 13 T. For this dipole model, CEA-DSM and CERN will design together the magnet. CERN will do the conductor characterization. PWR will do the thermal design and thermal component tests. CEA-DSM will fabricate the coils and CERN will build the mechanical support structure. Combined teams will integrate the coils into the support structure. The cryogenic test of the model will be done in the CERN test station.

DOW task 7.3

Deliverables of tasks	Description/title	Nature	Delivery month
7.3.1	Dipole model test results analyzed	R	M48

Mile-stone	Description/title	Nature	Delivery month	Comment
7.1.1	1st annual HFM review meeting	O	M12	
7.1.2	2nd annual HFM review meeting	O	M24	
7.1.3	3rd annual HFM review meeting	O	M36	
7.1.4	Final HFM review meeting	O	M48	
7.2.1	Methodology for the certification of radiation resistance of coil insulation material	R	M24	
7.2.2	Preliminary heat deposition model for a dipole Nb_3Sn model magnet	R	M12	publication on web
7.2.3	Engineering heat deposition model for a dipole Nb_3Sn model magnet	R	M24	publication on web
7.3.1	Dipole Nb_3Sn coils finished	D	M36	2 coils ready for mounting
7.3.2	Dipole Nb_3Sn model magnet finished	D	M42	Ready for cold test

budget

EuCARD - WP7 HFM - Task 7.3: Models v5

Beneficiary short name [a]	Average direct monthly salary * (€)	Rate for personnel indirect costs (%)	Rate for material and travel indirect costs (%)
IRFU/CEA-DSM	5,900	63	0
CERN	5,900	60	60
WME/PWR	3,800	60	60

20/02/2008 WRUT: salary 2875, pm 10, consum 20000, travel 5000, total 86 k, EC 34.08 k
21/02/2008 WRUT: 0
21/02/2008 WRUT: salary 3800, pm 7, consum 15000, travel 4000, total 72.96 k, EC 36.48 k

* To prevent rounding problems on the cost data, give the monthly salary as a multiple of 100 €
[a] In alphabetic order

Beneficiary short name (all costs in €)	Person-Months	Personnel direct costs	Personnel indirect costs	Sub-contracting cost	Consumable and prototype direct costs	Travel direct costs	Material and travel indirect costs	Total direct costs	Toal indirect costs	Total costs (direct +indirect)	EC requested funding[1]
IRFU/CEA-DSM	47	277,300	174,699	0	200,080	15,000	0	492,380	174,699	667,079	205,900
CERN	49	289,100	173,460	0	283,025	15,000	178,815	587,125	352,275	939,400	272,959
WME/PWR	7	26,600	15,960	0	15,000	4,000	11,400	45,600	27,360	72,960	36,500
0		0	0	0			0	0	0	0	
0		0	0	0			0	0	0	0	
0		0	0	0			0	0	0	0	
0		0	0	0			0	0	0	0	
0		0	0	0			0	0	0	0	
Totals:	103	593,000	364,119	0	498,105	34,000	190,215	1,125,105	554,334	1,679,439	515,359
FIXED TARGETS										1,679,400	518,400
CHECKING THE CONDITION										NOT OK	OK

[1] In principle 30% of total costs

people

CEA	CERN	PWR
J-M Rifflet (TL)	G. de Rijk (LC & design))	J. Polinski (LC)
M. Durante (LC)	G. Kirby (design)	
F. Rondeaux (technical Responsible)	E. Todesco (design)	
P. Manil (design & construction)	M. Karppinen (construction)	
	J-C. Perez (construction)	
	M. Bajko (cold test)	
	F. Borgnoluti (design)	
	L. Oberli (conductor)	
	L. Bottura (conductor characterization)	
	S. Sgobba (materials)	