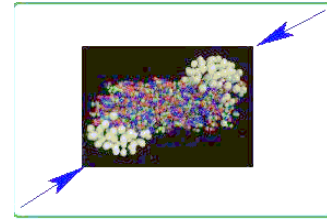




High Energy
High Intensity
Hadron Beams



CARE-HHH Network: Second Quarterly Report 2005

F. Ruggiero and W. Scandale, 31 August 2005

In the second quarter of 2005 the activity of CARE-HHH continued being devoted to provide the planned deliverables and to clarify the additional networking aspects introduced in the first quarter of 2005, aiming at the optimal use of the existing European hadron accelerator facilities at CERN and GSI. The list of tasks accomplished is given below in chronological sequence.

Overall CARE-HHH Network activities in the Second Quarter 2005

- April 2005: second meeting on LHC upgrade with ATLAS and CMS physicists (8 participants). Items discussed: possible IR upgrade scenarios and implementation, request for identification of a team to estimate the effects of high luminosity interaction debris on the superconducting triplets.
- May 2005: second meeting of the Pulsed Magnet Working Group with 19 participants (see minutes <http://pmwg.web.cern.ch/PMWG/2nd%20meeting.htm>). The main goals were:
 - To define an inventory of resources (tooling and personnel) that may become available.
 - To review the present activity and identify possible synergies within presently available resources.
 - To discuss the organization of the CARE-HHH-AMT workshop in Frascati.
- May 2005: contribution to PAC 2005 (USA): Papers of R. Ostojic et al. (http://care-hhh.web.cern.ch/care-hhh/Literature/MPPT043_Ostojic.pdf), and P. McIntyre et al.:
 1. <http://dphs10.saclay.cea.fr/Doc/Care/Files/care-conf-05-004.pdf>,
 2. <http://dphs10.saclay.cea.fr/Doc/Care/Files/care-conf-05-006.pdf>
 3. <http://dphs10.saclay.cea.fr/Doc/Care/Files/care-conf-05-007.pdf>
- May 2005: invited contribution to the HIF 2005 workshop organized by the INFN. W. Scandale presented a talk “High Intensity Injector Chain for the LHC” <http://agenda.pi.infn.it/askArchive.php?base=agenda&categ=a0523&id=a0523s1t3/transparencies>.
- June 2005: A. Devred took part to the DOE review of LARP at FNAL.
- July 2005: contribution to the 61th meeting of the LHC collimation working group (see minutes http://lhc-collimation.web.cern.ch/lhc-collimation/files/minutes_2005-07-08.pdf) W. Scandale presented a possible scenario to investigate crystal collimation in the SPS in view of the LHC intensity upgrade (see transparencies http://www.cern.ch/lhc-collimation/files/WScandale1_2005-07-08.pdf)
- July 2005: contribution to the Atlas Tracker Upgrade Workshop in Genova (see web-site: <http://atu-2005.ge.infn.it/>) F. Ruggiero presented the plans for the Super LHC (see

transparencies

<http://agenda.cern.ch/askArchive.php?base=agenda&categ=a053875&id=a053875s0t2/transparencies>).

- July 2005: publication of the proceedings of the workshop HHH-2004
- July 2005: completion of the proceedings of the workshop CC-2005, <http://care-hhh.web.cern.ch/CARE%2DHHH/CrystalCollimation/>
- July 2005: creation of the web page for the CARE-HHH-APD work-package.
- July 2005: progress on the web based code repository included in the CARE-HHH-APD work-packages (CERN summer student R. Basset supervised by F. Zimmermann).
- July 2005: written contribution to the HIF 2005 proceedings. Author W. Scandale, title: "Possible scenarios for the LHC upgrade", <http://care-hhh.web.cern.ch/CARE-HHH/LUMI-05/Organization/Arcidosso/LiteratureForLumi05.html> .
- August 2005: completion of the preparation of the Workshop on "Scenarios for the LHC luminosity upgrade", Arcidosso, 31/08-3/09/2005: <http://care-hhh.web.cern.ch/CARE-HHH/LUMI-05/>.

Planning of Future CARE-HHH workshops in 2005

- CARE-HHH-APD Workshop on "Scenarios for the LHC luminosity upgrade", Arcidosso, 31/08-3/09/2005. Web site: <http://care-hhh.web.cern.ch/CARE-HHH/LUMI-05/> . Topics:
 - (i) optical designs and luminosity performance for alternative IR layouts (dipole first vs quadrupole first (Nb-Ti or Ni3Sn) vs ironless magnet at very low β^* ,
 - (ii) beam-beam compensation schemes and machine-experiment interface,
 - (iii) machine and magnet parameters for high energy injectors: lattice, magnet aperture, injection and extraction for new ring in the ISR tunnel, super-SPS with new transfer lines, or booster ring in the LHC tunnel.

We acknowledge the support of the European Community-Research Infrastructure Activity under the FP6 "Structuring the European Research Area" programme (CARE, contract number RII3-CT-2003-506395).

Table 1: Overview of meetings, workshops and events (co)organized by the Activity or with Activity contributions

HHH Activity 2005	January	February	March	April	May	June	July	August	September	October	November	December
Activity yearly and/ or steering meeting			2 CERN (CH) coordination meeting	5&6 CERN (CH) steering meeting								
Meeting/Workshop WP1 AMT			3-4 workshop CERN (CH); 22-23 workshop CERN (CH)									
Meeting/Workshop WP2 ABI		3 CERN (CH) AB seminar										
Meeting/Workshop WP3 APD			7-8 workshop CC-2005 CERN (CH)		8-7 collimation WG CERN(CH)							
Workshop with other CARE activity												
Joint meeting with other collaborations												
PMWG		17-18 CERN (CH)			18-19 CERN (CH)							
LUMIUP	14 CERN (CH)			13 CERN (CH)								
Conferences & workshops												
PAC05					18-25 contributed papers							
US-LARP				6-8 collaboration meeting								
HIF2005					29 invited talk		29 written contribution					
IFAE2005			30/03-02/04 invited talk									
CPPM Marseille				7-8 invited talk								
ATU2005						3	18 invited talk					

Table 2: List of meetings, workshops and events (co)organized by the Activity during 2005

Date	Title/subject	location	Main organizer	Number of participants	Comments and Web site
14 Jan	1 st LUMIUP meeting	CERN (CH)	HHH-coordinators	7	Discussion on LHC luminosity upgrade scenarios. http://care-hhh.web.cern.ch/care-hhh/Meetings/LHCUG20050114.txt
3 Feb	AB seminar	CERN (CH)	AB-seminar-coordinator	About 50	<i>LHC Upgraded Taking Shape – Highlights of HHH-2004: “Beam Dynamics in Future Hadron Colliders and Rapidly Cycling Synchrotrons”</i> W. Scandale (part I), F. Zimmermann (part II)
17-18 Feb	1 st PMWG meeting	CERN (CH)	HHH-coordinators	About 20	Pulsed Magnet Working Group meeting. http://pmwg.web.cern.ch/PMWG/1st%20meeting.htm
2 Mar	CARE-HHH coordination meeting	CERN (CH)	HHH-coordinators	5	Review of the HHH activity http://care-hhh.web.cern.ch/care-hhh/Meetings/CAREHHHcoordinationmeeting02032005.txt
3-4 Mar	2 nd HHH-AMT workshop	CERN (CH)	HHH-AMT (WP1) coordinators	About 80	Review of thermal effects induced by beam on SC magnets. http://amt.web.cern.ch/amt/
7-8 Mar	2 nd HHH-APD mini-workshop	CERN	HHH & HHH-APD (WP3) coordinators	About 80	Review of crystal assisted extraction and collimation in circular accelerators. http://care-hhh.web.cern.ch/CARE%2DHHH/CrystalCollimation/
Mar & Apr	Meeting with and seminars by P. McIntyre	CERN (CH)	HHH-coordinators	From 2 to 80	http://care-hhh.web.cern.ch/care-hhh/meetings.htm
22-23 Mar	3 rd HHH-AMT workshop	CERN (CH)	R. Maccaferri (CERN) & S. Gourlay (NLBL)	About 80	Review of insulation in SC magnets. http://amt.web.cern.ch/amt/
30 Mar – 2 Apr	IFAE 2005	Catania (I)	Ad hoc committee of INFN Catania	About 100	Review High Intensity physics experiments. http://cms.ct.infn.it/ifae/
5-6 Apr	CARE steering committee	CERN (CH)	CARE-coordinators	About 20	http://care.lal.in2p3.fr/CAREmeetings/Management/Steering/april-05-05/HHH.ppt
6-8 Apr	US-LARP collaboration meeting	Port Jefferson (USA)	US-LARP-coordinators	About 60	Financial issues for FI2006 and FY 2007 http://www.agsrhichome.bnl.gov/LARP/050406_danfords/
7-8 Apr	Mini-workshop on Future Hadron Acc.	Marseille (F)	Ad hoc organizing committee	About 30	Issues related to future hadron colliders; http://maretude.in2p3.fr/cdsagenda/fullAgenda.php?ida=a0523
13 Apr	2 nd LUMIUP meeting	CERN (CH)	HHH-coordinators	10	Discussion on LHC luminosity upgrade scenarios. Web site

18-25 May	PAC 2005	USA	PAC committee	700	http://care-hhh.web.cern.ch/care-hhh/Literature/MPPT043_Ostojic.pdf
19-20 May	2 nd PMWG meeting	CERN (CH)	HHH-coordinators	About 25	Pulsed Magnet Working Group meeting. http://pmwg.web.cern.ch/PMWG/2nd%20meeting.htm
29 May	HIF 2005	Elba Island (I)	INFN	80	http://agenda.pi.infn.it/askArchive.php?base=agenda&categ=a0523&id=a0523s1t3/transparencies
8 July	61 th Collimation Working Goup	CERN (CH)	CERN Collimation Team	15	http://lhc-collimation.web.cern.ch/lhc-collimation/files/minutes_2005-07-08.pdf http://www.cern.ch/lhc-collimation/files/WScandale 1 2005-07-08.pdf
18-20 July	ATU2005	Genova (I)	INFN	80	http://atu-2005.ge.infn.it/ http://agenda.cern.ch/askArchive.php?base=agenda&categ=a053875&id=a053875s0t2/transparencies
29 Jul	HIP 2005	Elba Island (I)	INFN	80	http://care-hhh.web.cern.ch/CARE-HHH/LUMI-05/Organization/Arcidosso/LiteratureForLumi05.html

Table 3: List of talks to workshops and conferences made by HHH members and which are about (or include) activities carried within HHH

#	Subject	Speaker/Lab	Event	Date	Talk Web site	CARE-Conf
1	LHC Upgrade	W.Scandale & F. Zimmermann /CERN	AB seminar	03/02/2005		
2	Collider Technologies	P. Mcinthyre /CARE expert	AT seminar	18/03/2005		
3	Magnet Technologies	P. Mcinthyre /CARE expert	AT seminar	04/04/2005		
4	LHC Energy Tripler	P. Mcinthyre /CARE expert	AT seminar	14/04/2005		
5	Cure for e-cloud	P. Mcinthyre /CARE expert	AT seminar	15/04/2005		
6	LHC Energy Tripler	P. Mcinthyre /CARE expert	Seminar in Dip. di Fisica di Milano	18/04/2005		
7	LHC Energy Tripler	P. Mcinthyre /CARE expert	CEA/Saclay seminar	20/04/2005		
8	LHC Upgrade	W. Scandale /CERN	IFAE 2005	31/03/3005	http://agenda.cern.ch/askArchive.php?base=agenda&categ=a051438&id=a051438s6t1/moreinfo	
9	HHH status report	F. Ruggiero /CERN	CARE-steering committee	06/04/2005	http://care.lal.in2p3.fr/CAREmeetings/Management/Steering/april-05-05/HHH.ppt	
10	LHC Upgrade	F. Ruggiero /CERN	CPMP meeting /Marseille	07/04/2005	http://atu-2005.ge.infn.it/	
11	LHC Injector Upgrade	W. Scandale /CERN	HIF 2005	29/05/2005	http://agenda.pi.infn.it/askArchive.php?base=agenda&categ=a0523&id=a0523s1t3/transparencies	
12	Crystal Collimation	W. Scandale /CERN	61 th Collimation WG	08/07/2005	http://www.cern.ch/lhc-collimation/files/WScandale_1_2005-07-08.pdf	
13	LHC Upgrade	F. Ruggiero /CERN	ATU 2005	18/07/2005	http://agenda.cern.ch/askArchive.php?base=agenda&categ=a053875&id=a053875s0t2/transparencies	

Table 4: List of document issued by HHH-participants

#	CARE document type and number	Title	Authors and Labs	Date
1	CARE-Conf-04-024-HHH	Proceedings of the 1st CARE-N3-ABI networking meeting		April 2005
2	CARE-Conf-04-023-HHH	Proceedings of the 2nd CARE-N3-ABI networking meeting		April 2005
3	CARE-Conf-05-001-HHH	Proceedings of the E-CLOUD'04 Workshop	Editor F. Zimmermann	
4	CARE-Conf-05-002-HHH	Proceedings of the HHH 2004 Workshop	Editor F. Zimmermann	
5	CARE-Conf-05-004-HHH	On the feasibility of a tripler upgrade for LHC	P. McIntyre, A. Sattarov	May 2005
6	CARE-Conf-05-005-HHH	Low- β quadrupole design for the LHC luminosity upgrade	R. Ostojic et al.	May 2005
7	CARE-Conf-05-006-HHH	Towards an optimization of the LHC intersection region using new magnet technology	P. McIntyre, A. Sattarov, J.P. Koutchouk	May 2005
8	CARE-Conf-05-007-HHH	Killing the electron cloud effect in the LHC arcs	P. McIntyre, A. Sattarov	May 2005
9	CARE-Report-05-15-HHH	First 2005 intermediate report on the HHH collaboration	F. Ruggiero, W. Scandale	April 2005

Table 5: Temporary staff hiring

#	Lab	Job Type	Duration	Work subject	Status

Table 6: Status of the lowest Sub tasks level in the WP which are supposed to have started according to the MS project breakdown in Annex 1

WBS #	Title	Original begin date (Annex 1)	Original end date (annex1)	Estimated Status	Revised end date
General	MS: annual HHH meeting				
	HHH coordination meeting (ID8)	T1-2005	T2-2005	100 %	
WP1-AMT	MS: AMT topical meeting on Insulation and Impregnation Techniques	T1-2005	T1-2005	100 %	On time: T1-2005
	MS: AMT workshop on Beam Generated heat and Magnet Quench Level	T1-2005	T1-2005	100 %	On time: T1-2005
	Web-based database for SC cable and magnets	T3-2004	T4-2006	10 %	Delayed to T4-2007
	MS: specific meeting on database	T2-2005	T2-2005	0 %	Delayed to T4-2005
	ID: first report on web based database	T2-2005	T2-2005	0 %	Delayed to T4-2005
	Catalogue of numerical codes for AMT1 and AMT4	T1-2004	T1-2004	20 %	Delayed to T4-2005
	Comparison of codes for AMT1 and AMT4	T1-2004	T2-2004	20 %	Delayed to T4-2005
	Identifications of main limiting issues	T2-2004	T4-2004	20 %	Delayed to T2-2005
	ID: Proceedings of the first topical workshop on superconductors	T1-2005	T1-2005	100 %	On time: T1-2005
	ID: report on AMT organization and conductor development	T1-2005	T1-2005	80 %	Delayed to T3-2005
	Comparative studies of alternatives using low field magnets for AMT2 and AMT3	T3-2004	T4-2004	30 %	Delayed to T3-2005
	Identification of general issues relevant for magnet design for AMT5	T3-2004	T4-2004	10 %	Delayed to T4-2005

	Review of the development in US and for ITER on conductors and magnet technology relevant for AMT1 and AMT2	T1-2005	T1-2005	90 %	Delayed: T3-2005
	Comparative studies for alternatives using low field magnets for AMT2 and AMT3	T4-2004	T2-2005	20 %	Delayed to T4-2005
	Determination of scaling law for magnets and cryogenic cost for AMT5	T4-2004	T2-2005	20 %	Delayed to T3-2005
	MS: preliminary report on scaling law for magnets and cryogenic cost for AMT5	T2-2005	T2-2005	20%	Delayed to T4-2005
WP2-ABI	ID: proceedings of the first ABI topical workshop	T1-2005	T1-2006	100 %	On time: T1-2005
	ID: proceedings of the second ABI workshop	T2-2005	T3-2005	90 %	On time: T2-2005
WP3-APD	Comparison of alternative synchrotron and IR design	T1-2004	T2-2004	75 %	Delayed to T3-2005
	ID: proceedings of the first APD workshop	T1-2005	T1-2005	100 %	On time: T1-2005
	Second topical workshop	T1-2005	T1-2005	100 %	On time: T1-2005
	MS: general APD meeting	T2-2005	T2-2005	0 %	

Table 7: Status with respect to the interim reports and deliverables to be done in 2005 according to the MS project breakdown

WBS #	Title	Due date in Annex 1	Status	Revised delivery date
General	-	-	-	
WP1-AMT				
15	MS: AMT topical meeting on Insulation	T1-2005	100 %	T1-2005
16	ID: proceedings if the first AMT topical workshop on superconductors	T1-2005	100 %	T1-2005
17	ID: report on AMT organization and conductor development	T4-2004	80 %	T2-2005
19	MS: AMT topical meeting on Beam loss induced thermal effects	T1-2005	100 %	T1-2005
WP2-ABI				
W3-APD				
48	MS: proceedings of the first topical APD workshop	T1-2005	100 %	T1-2005
49	ID: meeting on simulation code bench marks	T1-2005	0 %	T3-2005

NOTE: The development of the web-based database for SC cables and magnets has been slow down. The main reason of the delay is that the budget to hire a dedicated fellow was not yet available in T2-2005.

Table 8: Status of the expenditures per participant and activity (in €)

participants	Integrated cost for permanent staff in 2004		Integrated cost for permanent staff in 2004		Integrated cost for equipment in 2004		Integrated cost for consumable in 2004		Integrated cost for travel in 2004	
	engaged	spent	engaged	spent	engaged	spent	engaged	spent	engaged	spent
01. CEA									2756.00	2756.00
04. GSI									3261.00	3261.00
05. DESY									2367.00	2367.00
10. INFN									5930.00	1893.00
11. TEU										
15. WUT									614.00	614.00
16. CSIC									2340.00	2340.00
17. CERN									26142.00	20637.00
19. PSI										
20. CCLRC									761.00	761.00

Table 9 Gantt table of the HHH Network progress in 2004

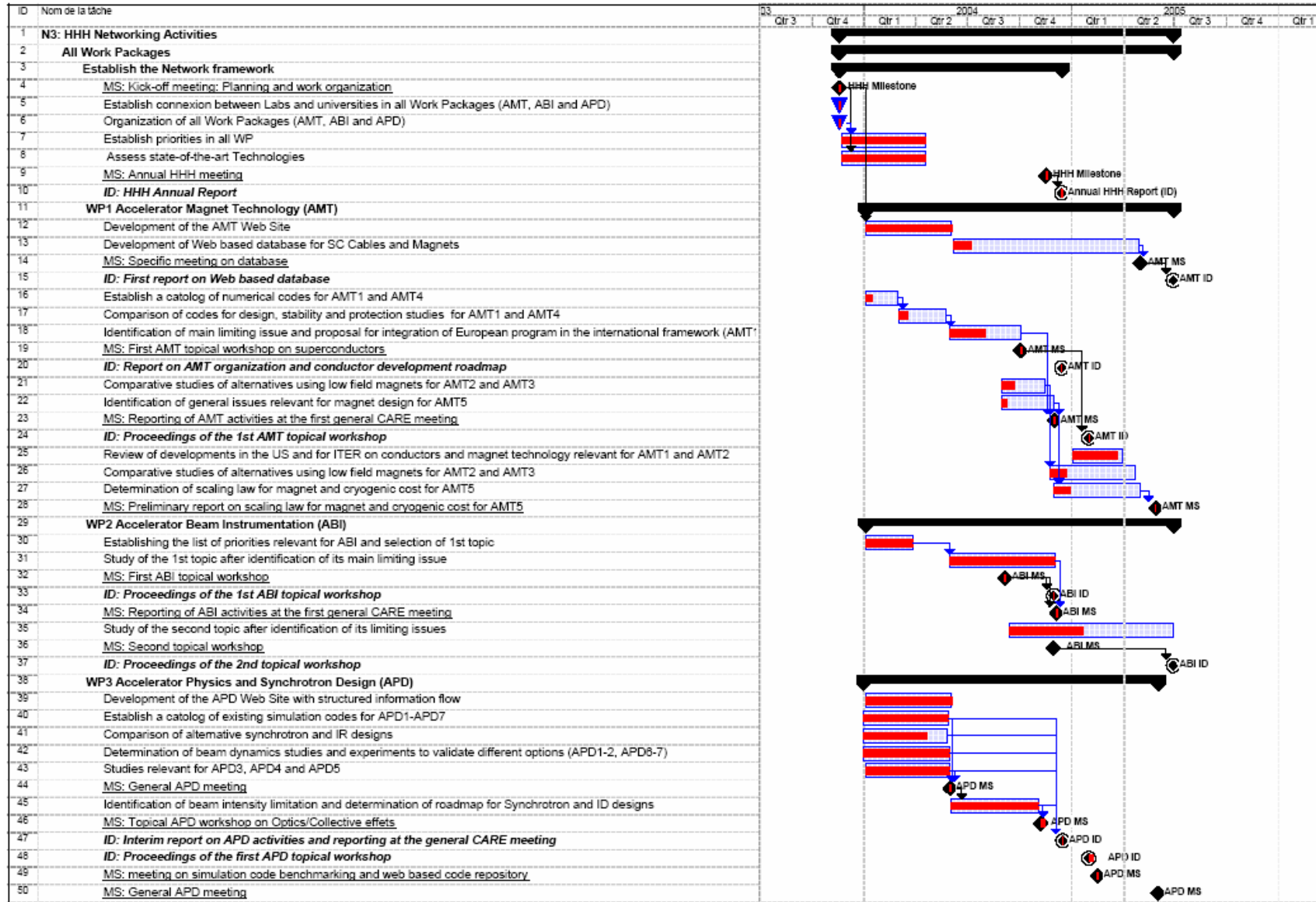


Table 10 Gantt table of the HHH Network progress expected in the next 18 months

