ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE
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Laboratoire Européen pour la Physique des Particules
European Laboratory for Particle Physics

CLIC-PLO/2007-002 13 February 2007

Minutes of the CTF3 Collaboration Board

(formerly called CTF3 Coordination Committee)

held at CERN on 16 January 2007

Participation:

CERN	R.Aymar/DG, J.P.Delahaye, G.Geschonke
Finland	D.O. Riska (Helsinki Institute of Physics)
France	Ch. Cavata, G.Fioni (DSM- CEA-DAPNIA)
	G.Wormser (LAL-Orsay)
	Y. Karyotakis (LAPP-Annecy)
	A. Mueller (IN2P3)
India:	V.C. Sahni, P. Shrivastava (RRCAT)
Italy	M. Calvetti, A. Ghigo (INFN-LNF)
Pakistan	H. Hoorani
Spain	D. Espriu, L. Garcia-Tabares (CIEMAT),
Sweden	T. Ekelof (Uppsala University)
Switzerland	L. Rivkin (PSI)
USA	M. Velasco (NWU)
	R. Ruth (SLAC)

Observers:

UK	J. Dainton (Cockcroft Institute)
	G. Blair (J.Adams Institute)
USA	A. Hutton (Thomas Jefferson Lab)

Excused:

Turkey	A. Kenan Ciftci (Ankara University)
Russia	V.N. Samoilov (JINR-Dubna)
	A.G.Litvak (IAP)
	A.N. Skrinsky (BINP)

1. Introduction by the CERN Director General (R. Aymar)

R. Aymar welcomed the delegations and reminded the board of the scope of CTF3 as well as the wish to run the CTF3 collaboration similarly to a Physics experiment collaboration, in line with the MoU. Up to now 16 collaboration agreements have been signed involving a total of 21 institutions. The latest members are PSI and India. The list of the members and observers as well as the MoU and the addenda describing the specific contribution of each member is available under the URL below:

https://clic-meeting.web.cern.ch/clic-meeting/2006/CTF3_Coordination_Mtg/Table_MoU.htm

R. Aymar stressed the fact, that CLIC and CTF3 have a high priority for CERN and that the CERN management has in the past supported CTF3 with additional resources whenever necessary, within the financial limitations and intends to continue this as far as possible.

Following a proposal of T.Ekelof, the name of the "CTF3 Co-ordination Committee" as defined in the MoU is modified to "CTF3 Collaboration Board" for better consistency with Physics collaborations. The membership of the Collaboration Board, as defined by the MoU of the CTF3 Collaboration, was discussed. Every "Party" can have two representatives in the Collaboration Board, namely a team leader and a deputy (adviser in MoU) but with a single vote. A "Party" is a collaborating institute or a funding agency. One MoU can cover several collaborating institutes. The delegations are invited to check the validity of the persons nominated for their representation in Annex 1 and to inform Sonia Escaffre of any modification.

In this context, it was pointed out, that in the future the three institutes collaborating with CTF3 under one common MoU signed by the Spanish Ministry of Science and Education, i.e. CIEMAT, the Politechnical University of Catalonia (UPC) and the Instituto de Fisica corpuscular (IFIC) Valencia, will be considered as individual members with corresponding representatives in the Collaboration Board.

The agenda and all slides are here.

Finally, a web site with links to the documentation and previous meetings of the board has been set-up and is available under the URL below:

http://clic-study.web.cern.ch/CLIC-Study/Collaborations.htm

2. Mandates and election of the Chairman of the Collaboration Board and of the CTF3 Spokesperson

The mandates (see Annex 1) of the chairman of the collaboration board and of the spokesperson of the CTF3 collaboration were discussed and accepted without modification.

A.Ghigo announced that he as well as C.Biscari were withdrawing their candidature for the election of the chairman of the Collaboration Board.

Candidates for the Chairman of the Collaboration Board were M.Calvetti and T.Ekelöf

and for the Collaboration Spokesperson G.Geschonke.

In a secret vote M. Calvetti and G.Geschonke were elected.

3. Highlights of the Progress in 2006 and Perspectives for the Future by G. Geschonke

G.Geschonke presented the status of CTF3. The major highlights in 2006 were:

a) Commissioning of the Delay Loop with a "phase coded" beam:

   The sub-harmonic bunching system has been brought into operation with three bunchers driven by travelling wave tubes and bunch interleaving of five bunches in the Delay Loop could be demonstrated.

b) Operation of part of the linac for 30 GHz RF power production to test CLIC RF components. This is now done routinely on a continuous schedule, 24 hrs per day, 7 days per week. The structure conditioning is done automatically, the accelerator is supervised from the CERN Control Centre (CCC). Up to 100 MW at 30 GHz were produced.

c) The transfer line TL1 between the Delay Loop and the Combiner Ring was installed, as well as many components of the Combiner Ring. TL1 and the injection area of the Combiner Ring were commissioned with beam. The installation of the Combiner Ring is somewhat late, beam could not be circulated because a number of components are still missing. Installation will be completed during the winter shutdown. This has, however, no impact on the rest of the programme.

The next step will be the full commissioning of the Combiner Ring scheduled for spring 2007.

The Transfer line TL2 from the Combiner Ring into CLEX is being designed and will be installed towards the end of the year, first beam will be sent into CLEX in 2008.

The CLEX building is nearing completion, equipment can be installed from the middle of 2007 onwards. Part of the equipment foreseen for CLEX is now

covered by collaborations. The Probe Beam is under the responsibility of CEA Saclay, the Two Beam Test stand is being built by Uppsala University with the PETS and accelerating structures being under the responsibility of CERN.

CIEMAT will produce precision magnet movers for TBL, as well as one prototype PETS including vacuum tank. Presently uncovered in TBL are all series elements. i.e. 15 more PETS, 16 quadrupole magnets the vacuum system as well as the RF diagnostics.

Operation in 2007 will start in March and continue all year, again split between 30 GHz conditioning and machine commissioning and studies.

Work on the Photo Injector is progressing, the laser has been transported from RAL to CERN and will be commissioned with the help of people from INFN Frascati, Milan and CERN. The nominal specifications have not been met yet and much more work is required for the phase coding. It is very important to finish the work on the laser amplifier soon, since the beam will also be used for the photo injector of the probe beam.

A new list of work packages which are still open in the moment will be published soon.

The present responsibilities and resources provided by the members of the CTF3 Collaborations are presented in Annex 3 and summarized in Annex 4 over the whole duration of the CTf3 project.

The recent change of the CLIC RF frequency to 12 GHz and the lowering of the accelerating gradient to 100 MV/m were discussed briefly. For the CTF3 installation this has no major consequence, other than changing the combination factor of the Combiner Ring from 5 to 4, which can be done by slightly changing the orbit length, well within the range of the wiggler. Of course also the PETS structures for the Test Beam Line TBL have to be built for 12 GHz as well as the RF equipment for the Two Beam Test Stand.

4. News from Collaboration Institutes

All delegations made statements about the status of their contributions.

Spain (D.Espriou): Many components have already been delivered, 2 MSFr and 4 my have been spent The focus of future contributions has slightly changed, instead of delivering the 16 quadrupole magnets, CIEMAT will design and build a prototype of a PETS system for TBL. Work on the pulser for the kicker will continue, but it will most likely be used for the "Tail Clipper" in TL2.

INFN (A.Ghigo): LNF is committed to deliver the vacuum chambers for the Combiner Ring and install them in January/February 2007. They will also participate in machine commissioning.

A Ghigo stressed the importance to finish the gun for the photo injector soon, in order to fulfil requirements of the EU FP6 funding.

INFN will provide expert manpower for the commissioning of the Probe Beam laser.

HIP, Helsinki (O. Riska): The past participation in CLIC structure work was mentioned, in the future it is planned to provide two engineering students to work on CLIC HDS accelerating structures, with focus on micro-precision machining. HIP expressed interest to get involved in studies of surface damage due to RF break-down.

SLAC (R.Ruth): For the moment the US participation is mainly focused on High Gradient work for accelerating structures. This is done in the frame of a "US High Gradient Collaboration" chaired by S.Tantawi, and by testing 11.4 GHz accelerating structures in NLCTA. Collaboration for this test programme might increase in the future. The impact of the CLIC gradient and frequency change on the US programme still has to be evaluated, but opens new possibilities of collaboration by using the power sources already available.

J.Adams Institute (G.Blair): At the moment there is no funding for a collaboration with CTF3, however some funds might become available in April. Academic staff will be appointed and a PhD student could start working on CTF3. The J.Adams Institute is planning to participate in a proposal to be submitted to FP7.

JLab (A.Hutton): Suitable topics for a collaboration have still to be identified. However, the present funding situation of JLab does not permit any large investments.

CEA/DAPNIA (G.Fioni): Substantial progress was reported on the Probe Beam complex (Califes). Pre-assembly of components has already started at CERN. For CLIC accelerating structure work a test cavity will be prepared in Saclay under clean conditions.

LAL (G.Wormser): LAL has provided already two thermionic guns for CTF3, one for the Preliminary Phase, the other one is presently the electron source for CTF3. The RF gun for PHIN is ready for brazing at CERN, for the Probe Beam gun all pieces are already manufactured.

Cockcroft Institute (J. Dainton): The Cockcroft Institute is already contributing to the study of a Multi-Beam Klystron (MBK). More scientific staff will be hired in the institute, a participation in CTF3 is envisaged. Collaboration within FP7 is somewhat difficult, because matching funds to the EU contribution have to be provided. A future reorganisation of the British particle and accelerator research could improve this situation.

North Western University Illinois (M.Velasco): Work is going on in the field of Beam Instrumentation. DoE support has been reached for the RF monitor. A reliable beam loss monitoring system will be implemented. Support from Fermilab for fast electronics has been obtained.

LAPP (Y.Kayotakis): Work on CLIC/CTF3 has high priority in IN2P3. LAPP is active in the development and series production of electronics for Beam Position Monitoring. Presently three people, including two engineers, are working on this project.

RRCAT (V.Sahni): India is collaborating with CTF3 on several topics. Two software engineers have developed applications programming for machine operation. The optics design for TL2 is done by RRCAT and is nearing completion. The vacuum chambers as well as five dipole magnets for this line will be built, design work and prototyping is under way.

PSI (L. Rivkin): A stronger PSI-CERN collaboration is desirable, testing of FEL prototypes with RF cavities at 12 GHz can be beneficial both for PSI and CTF3. A modulator for a 3-GHz klystron was shipped to CERN.

Uppsala University (T.Ekelöf): Work on the Two Beam Test Stand is advancing as foreseen. Developments of a bunch phase monitor continue and a new design of a "nearly confocal resonator" is being pursued (within EuroTeV). In the moment three people are working full-time on the Two Beam Test Stand.

T.Ekelöf discussed expressed his worries about not having 12 GHz testing possibilities at CERN for nearly two years.

5. Proposal for a Machine Advisory Committee

Jean-Pierre Delahaye presented the mandate and possible members of a Machine Advisory Committee for CLIC. The mandate is attached in Annex 5. Since CTF3 is part of the CLIC study, the CLIC MAC would report to the CERN directorate for CLIC, but also to the Collaboration Board for CTF3 related issues.

M.Calvetti proposed to hold two meetings per year for better communication and exchange between the members of the collaboration.

G.Geschonke J.P. Delahaye

ANNEX 1: CTF3 collaboration members (addendum signed)

Countries	Funding Agencies	Laboratory	Team Leader and Deputy
CERN	CERN	CERN	J-P. Delahaye, G. Geschonke
FINLAND		Helsinki Inst of Phys (HIP)	D.O. Riska, K. Österberg
FRANCE	CEA/DSM-Saclay	DAPNIA	A. Mosnier
	CNRS/IN2P3	LAL, LURE	G. Wormser
		LAPP	Y. Kariotakis
INDIA*	Indian DAE	RRCAT, Indore	V. Sahni, P. Shrivastava
ITALY	INFN	LNF	M. Calvetti, A. Ghigo
RUSSIA		Budker Inst (BINP)	A. Skrinski
		IAP	A.G. Litvak
	Dubna	JINR	V. Samoilov
SPAIN	Ministry of Education & Science (MEC)	CIEMAT, UPC, IFIC	J. Fuster, L. Garcia-Tabares
SWEDEN	Swedish Research Council	Uppsala Univ and Svedberg Lab (TSL)	T. Ekelof, V. Ziemann
	Wallenberg Foundation		
SWITZERLAND		Paul Scherrer Inst (PSI)	R. Eichler, L. Rivkin
TURKEY		Ankara Univ Group	A.K. Ciftçi
USA	DOE	Northwestern Univ Illinois (NWU)	M. Velasco
		SLAC	R. Ruth, S. Tantawi

* India has not signed the CTF3 MoU, but has an agreement with CERN for the development of novel accelerator technologies, of which CTF3 is part.

Observers

Countries	Funding Agencies	Laboratory	Team Leader and Deputy
IRAN		Inst for Theoretical Phys and Math (IPM)	H. Arfaei
PAKISTAN		National Centre for Physics (NCP)	H. Hoorani, S. Ahmad
UNITED-KINGDOM	PPARC	RAL	G. Hirst, H. Hutchinson
		J. Adams Institute for Accelerator Science	G. Blair, K. Peach
		Cockroft Institute	S. Chattopadhyay, J. Dainton

Annex 2:

Mandate of the CTF3 Collaboration Board Chairperson

The CTF3 Collaboration Board Chairperson is elected by the CTF3 Collaboration Board for a term of 2 years, renewable.

The Chairperson has the following duties:

- Call the CTF3 Collaboration Board at least once a year and prepare the agenda for these meetings
- Strive to reach decisions by consensus in the CTF3 Collaboration Board
- In case of a decision by vote, decide on the votation procedure ("normal" or "special" according to the terms of the CTF3 MoU)
- Represent the CTF3 Collaboration Board Members in their relation to the CTF3 Project Management
- Represent, together with the Spokesperson, the CTF3 Collaboration in its outside relations to other groups and authorities.

Mandate of the CTF3 Spokesperson

The CTF3 Spokesperson is elected by the CTF3 Collaboration Board for a term of 3 years, renewable.

The Spokesperson has the following duties:

- Set up and lead a CTF3 Project Management Team, the composition of which should be endorsed by the CTF3 Collaboration Board
- Lead the daily execution of the project
- Follow up, with each CTF3 Collaboration Members, the commitments made by that Member in the CTF3 MoU
- Monitor financial and personnel resources and report the status of these resources to the CTF3 Collaboration Board
- Represent, together with the Collaboration Board Chairperson, the CTF3 Collaboration in its outside relations to other groups and authorities.

ANNEX 3: Work packages under the responsibilities of and resources provided by the CTF3 collaboration members

15.12.2006		spent up to end 2004		pledged for 2005-2009		totals	
		manpower my	cost kSFr	manpower my	cost kSFr	*manpower*	*cost*
Addendum signed							
Helsinki Institute of Physics (HIP)	specialist in micro machining technologies for CLIC structure developments			3.00		*3.00*	
	establish dedicated project for development of technology with industrial and academic partners						
Budker institute of Nuclear Physics (BINP) Novosibirsk	11 quadrupoles, 26 sextupoles				270		*270*
	future: more magnets as required according to the same conditions.						
Northwestern University Illinois	one accelerating structure		100			*3.00*	*350*
	beam loss monitor		100		50		
	total manpower	2.00		1.00			
	RF pick-up for bunch length				100		
CERN	existing facilities		40'000			*225.00*	*70'815*
	new equipment		16'000				
	total manpower	100.00					
	power converters				860		
	waveguides				100		
	CLEX				2'500		
	technical services				2'500		
	project management						
	TL1 and CR				600		
	magnets for CR				330		
	vacuum equipment for CR				200		
	installation TL1 and CR				1'600		
	Controls CR				100		
	CTF3 commissioning, testing						
	accelerating and PETS development				4'000		
	total manpower			125.00			
	Probe Beam				1'950		
	ISTC 30 GHz source				75		
Ankara University	manpower for CTF3 operation	0.25		5.00		*5.25*	
IAP	30 GHz power source				1'024	*0.00*	*1'024*
	Manpower and material , ISTC 227k$ included						
SLAC	electron gun triode (long term loan)		320			*3.00*	*320*
	injector design and commissioning	3.00					
JINR Dubna	Manpower for automatic conditioning		114				*114*
Sweden	Preliminary phase participation	1.50				*3.00*	*2'800*
	Phase monitor	1.50	150				
	Celsius magnets				150		
	Phase monitor cont.				200		
	Two Beam Test Stand				2'300		
CEA	Probe Beam linac			30.00	1'950	*30.00*	*1'950*
CNRS IN3P3	LURE 32 quadrupoles					*23.00*	*450*
	LAL						
	Thermionic guns (15 my = 2.25 MCHF)	15.00					
	probe beam photo gun			3.00	300		
	LAPP BPM read-out electronics			5.00	150		
Spain	15 qadrupoles for TBL + precision tables					*4.00*	*2'000*
	2 Septa for CR						
	Extraction kicker for CR						
	HV pulser for kicker						
	32 corrector magnets for CR						
	PETS design						
	Contribution to BPM design for TBL			4.00	2'000		
INFN	Delay Loop	25.00	4'000			*33.00*	*4'900*
	vacuum chamber TL1 and CR			4.00	900		
	CTF3 commissioning, operation			4.00			
PSI	Modulator components				200		*200*
	sum:	**148.25**	**60'784**	**184.00**	**24'409**		
Under discussion							
India	TL2 design,						
	Alu vac chambers for TL2						
UK	Beam Instrumentation line,						
	Studies						
RAL	Laser for photo injector						
	total sum without CERN	**48.25**	**4'784**	**59.00**	**9'594**		

ANNEX4 : Summary of the resources presently allocated to and still missing on the CTF3 project

		Status March 04		Status Nov 05	
		Budget	Manpower	Budget	Manpower
		MCHF	p-y	MCHF	p-y
TOTAL TO COMPLETION		95.4	393.3	101.1	395.8
CERN	Existing Equipments	40.0		40.0	
	Contrib. 2000-2003	16.0	100.0	16.0	100.0
	Pledged 2004-2009	17.4	150.0	14.9	125.0
	Contingency	0.0	0.0	5.5	25.0
COLLAB	Contrib. 2000-2003	4.8	48.3	4.8	48.3
	Pledged 2004-2009	0.0	0.0	9.4	59.0
Missing		17.2	95.0	10.5	38.5

ANNEX 5: **CLIC Machine Advisory Committee (MAC)**

Generalities

The objective of the CLIC study is to develop the technology to extend experimental physics with Electron Positron Linear Colliders into the Multi-TeV colliding-beam energy range [1]. This ambitious goal led to a novel machine concept, the Two-Beam Acceleration (TBA) scheme, consisting of the Main Beam and a parallel Drive Beam providing the RF power for acceleration [2], [3]. This requires challenging R&D both on technological and theoretical aspects concerning various subjects and novel schemes like the Drive Beam generation and High Frequency RF power production, high accelerating gradient, precise alignment and high geometrical stability, etc.

The short term goal of the CLIC study [4] is to answer the main feasibility issues related to the CLIC technology by the year 2010. The study focuses on three main areas:

a) Design of a Multi-TeV Linear Collider based on the CLIC technology including beam dynamics studies

b) Development of CLIC specific components, especially Accelerating Structures and Power Extraction Structures

c) Address the key issues of the feasibility of the CLIC scheme in a CLIC Test Facility CTF3 [5], [6], which serves as a power source for high frequency and a test bed of the two-beam concept with high power tests of CLIC components.

CTF3 is being built in stages in the frame of a multi-lateral collaboration [7] of 16 Institutes from 11 countries, each one responsible for well identified work packages with its own resources, and managing together the project.

Mandate

A CLIC Machine Advisory Committee is being set up with the following mandate

- Assess the scope of the CLIC study and the technical choices for optimum performance and cost.
- Assess the work programme aiming at a demonstration of the main CLIC feasibility issues and the preparation of a Conceptual Design Report by 2010.
- Identify technical difficulties or risks of the study
- Check the compatibility of the available resources with the work programme
- Monitor the progress

Organization

The MAC acts as an advisory committee reporting to the CERN DG and the CTF3 Collaboration Board

It meets at least once a year and provides a written report including recommendations at the latest two weeks after the meeting.

Members are nominated for three years.