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## ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE **CERN** EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

Action to be taken		Voting Procedure
For information	SCIENTIFIC POLICY COMMITTEE 260 <sup>th</sup> Meeting 15 June 2009	
For information	FINANCE COMMITTEE 325 <sup>th</sup> Meeting 17 June 2009	
For information	COUNCIL 151 <sup>st</sup> Session 18 June 2009	

## Modified strategy and goals for 2009

As a consequence of the incident on 19 September 2008 during the commissioning of the LHC the targets for 2008 could not be achieved as outlined in the annual progress report.

Consequently also the goals for 2009 and for the following years need to be adjusted. A short summary concerning the modifications for 2009 is given here. The following years will be dealt with in the MTP for 2010-2014 in a separate document.

The highest priority for 2009 is the repair work of the LHC, the installation of preventive measures, the mitigation of collateral effects, and the start up with beam followed by first collisions end of October and a physics run extending into 2010 suppressing the usual winter shut down. All resources necessary to achieve these goals within the schedule derived at the Chamonix meeting early February 2009 have been allocated as described in the following resources sheets.

As a consequence of the reallocation of resources to the LHC machine most activities in the accelerator sector concerning luminosity upgrade of the LHC and concerning Linear Collider developments are slowed down and the achievement of the goals will be delayed by up to one year. This is in particular due to the fact that the skills and the manpower needed for the start-up of LHC are in many cases identical to those for the accelerator development.

The LHC experiments on the other hand are using the shut down time to repair some detector components and to install the parts which were missing at the September turn on. They are now in an unprecedented state of readiness for data taking.

The fixed target program will be performed as planned with the caveat that the total number of protons which can be delivered to the experiments is lower by design of the accelerator chain than expected by the experiments. Final estimates and priorities depending on the science case and the readiness of the respective experiments will be given following the discussions in the May meeting of the SPC.

In order to increase the physics output from LHC for CERN and for the scientific community as a whole an Analysis Centre will be installed at CERN for staff and users where experimenters and theorists will work together and in close collaboration with other institutes participating at the LHC.

The participation in the R&D work for a Linear Collider is mandatory for CERN in both areas, accelerator and detector. To this end, the participation in common efforts and working groups of the ILC and CLIC developments is increased. The installation of a Linear Collider Detector Project is another measure vital for CERN to prepare its future role at the energy frontier.

Despite the additional resources needed for the turn on of the LHC it is mandatory to start already in 2009 with the most urgent consolidation works. The funding allocated for this is detailed in the resources sheets.

Finally, planning for a new Tier0 centre, mandatory for the LHC community, and planning for an extension of restaurant 1 will be performed in 2009.

Table 1 summarises the revised 2009 Targets by fact sheet heading, Table 2 shows the financial impact for the expenses and Table 3 explains the variations including the budget carry forward from 2008 to 2009 in line with the Financial Rules as approved by Council in December 2008.

## Table 1: Revised 2009 Targets

Fact sheet	Title	2009 Targets MTP 2008	2009 Targets Revised	Explanation
1	LHC Machine and Injectors	Increase luminosity and stabilize operation, ramp up to 14 TeV	Sector 3-4 repair including induced consolidation, beam from September 2009, first collisions at the end of October at 10 TeV	New LHC schedule following the incident in sector 3-4 on 19/9/08
2	LHC Experiments: Atlas	Physics run at initial luminosity and nominal energy	Detector improvements and repairs, preparing upgrades, cosmic rays run until start of physics with first collisions	New LHC schedule following the incident in sector 3-4 on 19/9/08
3	LHC Experiments: CMS	Physics run at initial luminosity and nominal energy	Detector improvements (step 2) and repairs, cosmic rays run until start of physics with first collisions	New LHC schedule following the incident in sector 3-4 on 19/9/08
4	LHC Experiments: Alice	pp physics data-taking. Continuation of installation of detectors (PHOS, TRD, EMCal) and systems (DAQ) during long shutdown)	Continuation of detector completion and preparation for data-taking in October	New LHC schedule following the incident in sector 3-4 on 19/9/08
5	LHC Experiments: LHCb	Normal data taking with complete detector at nominal luminosity and energy. Physics to explore measurements, where large new physics effects are not excluded, down to the level of the Standard Model expectation	Continuation of detector completion and preparation for data-taking in October	New LHC schedule following the incident in sector 3-4 on 19/9/08
6	LHC Experiments: Totem	Complete detector installation and commissioning; Global commissioning with all subsystems; Perform the measuremetns as foreseen in the proposal	Completion of construction in cooperation with CMS and machine safety system teams; and preparation for data-taking	New LHC schedule following the incident in sector 3-4 on 19/9/08 and interface with machine protection
7	LHC Computing	First extended production run, need to ensure a certain level of service capable of withstanding planned and unplanned incidents	Production run (with cosmic rays until first collisions), implementation impact of new LHC schedule with long-run from end 2009 onwards without shutdown	New LHC schedule following the incident in sector 3-4 on 19/9/08
8	Non-LHC Physics		As planned, non-LHC diversification workshop in May and neutrino workshop in September	New inititaive for non-LHC physics programme by incoming Management
9	Scientific support	Additional manpower support for physics data handling / support physics run	Support for detector repairs, preparation of long LHC run from late 2009 onwards	New LHC schedule following the incident in sector 3-4 on 19/9/08, new initiative for physics analysis centre
a	Theory	Support physics run	Support physics run / participation in studies on scientific risks and discovery potential	
b	Physics analysis centre		Creation of physics analysis centre	
10	PS and SPS complexes, accelerator technical services	ISOLDE: resolve ventilation problems in ISOLDE target area, construct and test two new target prototypes for production of new isotopes for approved scientific programme, R&D on SC linac upgrade	As planned, with corrected total number of protons	The total number of protons which can be delivered to the experiments is lower by design of the accelerator chain than expected by the experiments
11	Infrastructure			
a	Manufacturing facilitites		As planned More transport related to LHC repair	
c	Informatics		As planned	
12	Safety, health and environment		As planned	
13	Administration		As planned	
a	Outreach and Scientific Exchanges		As planned	
b	Knowledge and Technology Transfer		Enhance mandate to include knowledge transfer	
15	Centralised expenses		As planned	
16	Linear Collider		As planned but CDP delayed by several	Less mannower available due to highest
a	CLIC	Complete CLIC Test Facility installlation	nonths	priority for LHC repair New initiative to have CERN participating
b	Linear Collider Detector R&D		Start of integration into the world wide study	in the detector R&D for future linear colliders
17	LINAC 4	Finish machine tunnel construction	runnel construction and preparation for machine construction	Less manpower available due to highest priority for LHC repair
18	LHC Focus Quadrupoles (NbTi)	Completion of TDR report, establish collaborations	Completion of TDR now in 2010 but collaborations established	Less manpower available due to highest priority for LHC repair
19	R&D accelerators		As planned	
20	Construction of PS2, SPL, and the S-LHC		n / a	
21	Consolidation			
a	accelerator and LHC consolidation and reliability	Continuation of additional acceleator consolidation to ensure reliable LHC operation	Recuperate delays from 2008 in consolidation projects (carry forwards)	Less manpower available due to highest priority for LHC repair
b	general infrastructure consolidation		Bringing forward funds from 2011 for most urgent repairs	New initiative to ensure reliable site operation addressing high risks of equipment failure, safety and reliability

Table 2: 1	Revised	2009	Budget	(expenses)
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	2009 Budget	2009 Revised	Variations of		
	CFRN/FC/5304/Rev.	Budget	Rev. Bud. with	Explanations for variations	
Activity	(2009 prices)	(2009 prices)	respect to Final		
	(2005 prices)	kCHE	Budget		
LHC programme (incl. projects)	252.035	263.990	11.955		
LHC machine and injectors	117.795	135,795	18.000		
I HC machine and experimental areas	115 265	106 385	-8,880	Change from operation to sector 3-4 renair	
Sector 3-4 repair	110,200	27 505	27 505	Impact from the Sentember 2008 incident	
LHC injectors (for heavy lons)	2 530	1 905	-625	Delayed to 2010 (focus on renair)	
	94 570	02 355	-2 215		
ATLAS detector	34,370 27.410	<b>52,333</b> 26,805	-2,213		
CMS detector	27,410	20,855	1 940		
ALICE detector	20,290	24,430	-1,040		
ALICE detector	11,985	11,950	-30		
LHCD detector	12,565	12,385	-180		
Common items, other experiments (inc. Totem, LHCf	5,860	9,490	3,630	Technical support is grouped	
Detectors re-scoping	10,460	7,185	-3,275	Additional allocations granted in 2008 (to CMS)	
LHC computing	39,670	35,840	-3,830	Reduction to start saving for the computing centre upgrade	
Other programmes	162,785	164,065	1,280		
Non-LHC physics	5,925	6,470	545	Additional funding for Na62, Cloud, etc.	
Theory	11,850	12,005	155	EU projects adjustment	
Physics analysis centre	5,085	6,125	1,040	Additional seed-funding / carry forward	
Scientific support	41,040	42,650	1,610		
Low and medium accelerators	8,280	7,990	-290		
PS and SPS complexes	52,260	49,395	-2,865	Move to accelerator technical services	
Accelerator technical services	38,345	39,430	1,085	From PS and SPS complexes and low and medium accelerators	
Infrastructure and services	339,925	357,720	17,795		
Manufacturing facilities	13,290	20,120	6,830	Carry forward from maintenance project, impact sector 3-4 repair	
General facilities and logistics	59,065	59,815	750	Carry forward from 2008, sector 3-4 transport	
Informatics	40,240	43,305	3,065	Carry forward and Openlab expenses covered by revenues	
Safety, health and environment	27,880	30,700	2,820	Carry forward of unspent waste-management project funds	
Administration	35,995	37,395	1,400	New organisational structure since 2009	
Outreach and KTT	17,420	17,350	-70		
Centralised expenses	122,620	125,620	3,000		
Centralised personnel expenses	28,815	31,115	2,300	Increased staff turnover and contribution to CHIS for pensioners	
Internal taxation	24,015	24,015			
Personnel on detachment	, · · ·	700	700	Expenses covered by revenues	
Energy and water	62.795	62.795			
Insurances and postal charges	6.995	6.995			
Interests and financial costs	23.415	23.415			
Projects	121,990	148,130	26,140		
CLIC	20.685	22.260	1.575	Carry forward, from 2008	
Linear collider detector	.,	570	570	New initiative by incoming management	
Linac 4	20.075	25.310	5.235	Re-profiling and carry forward from 2008	
Focus guadrupoles (NbTi)	5.090	4.810	-280	Re-profiling	
R&D	12,585	14,770	2,185		
R&D accelerators	3 855	5 880	2 025	Carry forward from 2008 and new EU projects	
Other B&D	8 730	8,890	160	FIL adjustments	
IHC ungrade (PS2, SPS, SPI studies, detectors)	16 890	18 640	1 750	Be-profiling and carry forward from 2008	
Accelerator consolidation	13,050	14 795	1,730	Carry forward from 2008	
IHC reliability and consolidation	78 205	14,733	1,070	Carry forward from 2008	
General infrastructure consolidation	20,505	10 500	12 345	Re-profiling and carry forward from 2008	
Grand Total in KCHE	3,235	18,580	13,343		
	876,735	953,905	57,170		

Please note that the amount of 57.2 MCHF corresponds to 4.8% of the total revenues.

## Table 3: Variations and impact between final 2009 budget and revised 2009 budget

2009 prices	
Carry forward from 2008 to 2009	29.4
Projects (Linac4, CLIC, Focus quadrupoles, consolidation etc.)	22.3
Carry forward (end of year) and committed but not yet received goods and services	
charged against operation headings with corresponding unspent budget	7.1
Additional expenses covered by revenues	8.9
EU income (reprofiling and new projects EUCARD and COFUND)	6.4
Open Lab, KTT and other external expenditure	2.5
Bringing forward of funds for consolidation / reprofiling	16.6
This covers both management initiative for most urgent repairs for reliable site operation,	
induced LHC consolidation of sector 3-4 incident	
Increased Centralized Expenses	2.3
Increase in staff turnover and in contribution to health insurance for pensioners	
Total in MCHF	57.2

Please note that the amount of 16.6 MCHF brought forward corresponds to 1.4% of the total revenues.