

Preliminary proposal for an SPS upgrade planning

(subset of slides presented at LMC 14.4.2010)

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The M, T, P resource estimates are consistently **very preliminary** ! They need to be refined and completed with profiles. Some of the estimates (only pre-studies, due to time available) have **large error bars** (> 1 MCHF) – even when made with the experience from other projects.

The convention for the specified time line was: Without “hard” reason (time to wait for civil engineering authorizations, mandatory prototyping phase, ...) a **planning is presented which is compatible with the given time frame**. For some items the feasibility – technical + time-wise – needs to be confirmed with results from ongoing studies + R&D.

To stay in the set time frame will require **significant manpower in the short term** – its availability (through re-prioritising other work, optimal phasing of activities over time, external help, ...) has not been addressed at this stage.

Simultaneous high work load from concurrent activities (upgrades, other projects, consolidation, ...) can generate **additional resource needs** (material, manpower) for specific teams (e.g. transport, radioprotection, vacuum, ...) – this has not been taken into account.

For some items the **resource needs depend strongly on the adopted option** and parameters. Depending on the general directions taken (e.g. the way and rate of coating) and various boundary conditions (concrete resource situation, concurrent workload for specific teams, external contributions, workshop space, ...) the most appropriate option(s) need to be re-laborated in detail, and the optimisation potential exploited.

Phases and overall time lines indicative; cost + manpower estimates very preliminary.

Activity\Year	2010			2011			2012			2013			2014			2015			M	P						
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	M	P
LHC Operation																									M	P
Injector Chain Operation																									M	P
SPS Upgrade							???			???															M	P

ZS	Studies	Studies	Co	Inst	Constr ?	Inst																		0.3	1.4	
Coating - existing chambers	Qualif.	Preparation		Coat	Prep.	Coa																		4.2	13	
Coating - new chambers	Qualif.	Preparation		Coat	Repl.	Pre	Coat	Rep	Preparation		Coating		Repl.											17.3	25	
Fast Feedback	Studies, design		Construction			Inst																		1.8	5	
200 MHz RF system	Studies, auth.		Purchase, construction, installation						Inst.															26.3	10.5	
Collimators	Studies, des.		Construction			Inst																			4	
Beam instrumentation	Studies, des.		Construction			Inst																			3.3	7.5
Dump system	Studies, design		Construction (incl. prototyping)						Inst.															5		
Kickers	Studies, design		Construction (incl. prototyping)						Inst.															4.1		

Suggestions for US-LARP involvement:

ZS, kickers: MD preparation + analysis, impedance measurements, simulations

Coating: R&D, production setting up, help during bulk work

Fast feedback (already ongoing): FB algorithms, signal processing, stripline kickers, pickups

Collimators (?): simulations, design