Proposal for LHC CC Design Review 2010

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First questions

- What is the purpose of phase 0?
 - Iuminosity increase (how much is worthwhile)?
 - Proof of Technology and Reliability?
 - Show crabbing works in high intensity hadron machine?
 - Decision 400 or 800 MHz ?

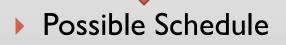
Need clear objectives to prove something.

- Frequency: If phase I @ 400 MHz, why phase 0 @ 800 MHz?
 - ▶ 800 MHz cavity is not a prototype for 400 MHz cavity.
- Invisibility for high intensity beam when "off" or "warm"?
 - Do not disturb luminosity physics
 - Instabilities due to CC
- Will point 4 remain available?
- > 2 experiments? How many crab cavities?

Getting to Phase 0

Phases to final testing of crab cavity in LHC:

- Confirm frequency
- R & D on delicate items
- Confirm main parameters for CC (meeting?)
- All efforts in one direction —> documentation for final design
- Design Review to launch final phase 0 construction with schedule taking into account status LHC
- Construction and system testing
- Installation and beam tests



Schedule

					2009			2010			2011		2012	
R & D and test stand work	Cavity													
	Vertical test													
	HOM couplers													
	LOM coupler													
	Main coupler													
	Tuner													
	Cryostat													
Confirmation main parameters														
Full Prototype Design for	Cryostat plus cavity													
	Personnel / Hardware safety													
	Tunnel layout, cryogenics interface													
	Survey / Alignment													
installation	Radiation Issues													
Installation	Cavity servo-control control													
	Synchronisation control													
	Slow controls													
	RF power source													
Paperwork for review														
Design validation review														
Construction & Installation	Construction cryomodules													
	Full bunker tests													
	Construction power source													
	Construction electronics													
	System tests													
	Tunnel mods.													
	Installation													
	Beam tests													

• April 2009:

- Confirm phase 0 CC parameters in April 2009.
- Review installation schedule and possibilities according to LHC status
- Get approval from CERN management for possible installation

July 2010:

- Design review to validate final crab cavity system design and to decide on the number of cavities to be built for installation in LHC at point 4
- Review installation schedule
- Installation of capture cavities @ 200 MHz / transverse damper upgrade will require a complete rethink.
- No attempt has been made to define the necessary resources

Conclusion

- Define aims of phase 0 installation
- Decide on final frequency to minimise effort
- Design review in 2010
 - to validate the complete CC system design and infrastructure to be installed in 2012 as phase 0.
 - To give a focus for the R & D and design and also is an occasion to make sure that all interfaces with the LHC have been adequately looked at.

Questions

- Do you agree?
- Are enough resources available?