



# LHC Crab Cavities - Phase 1 - Schedule

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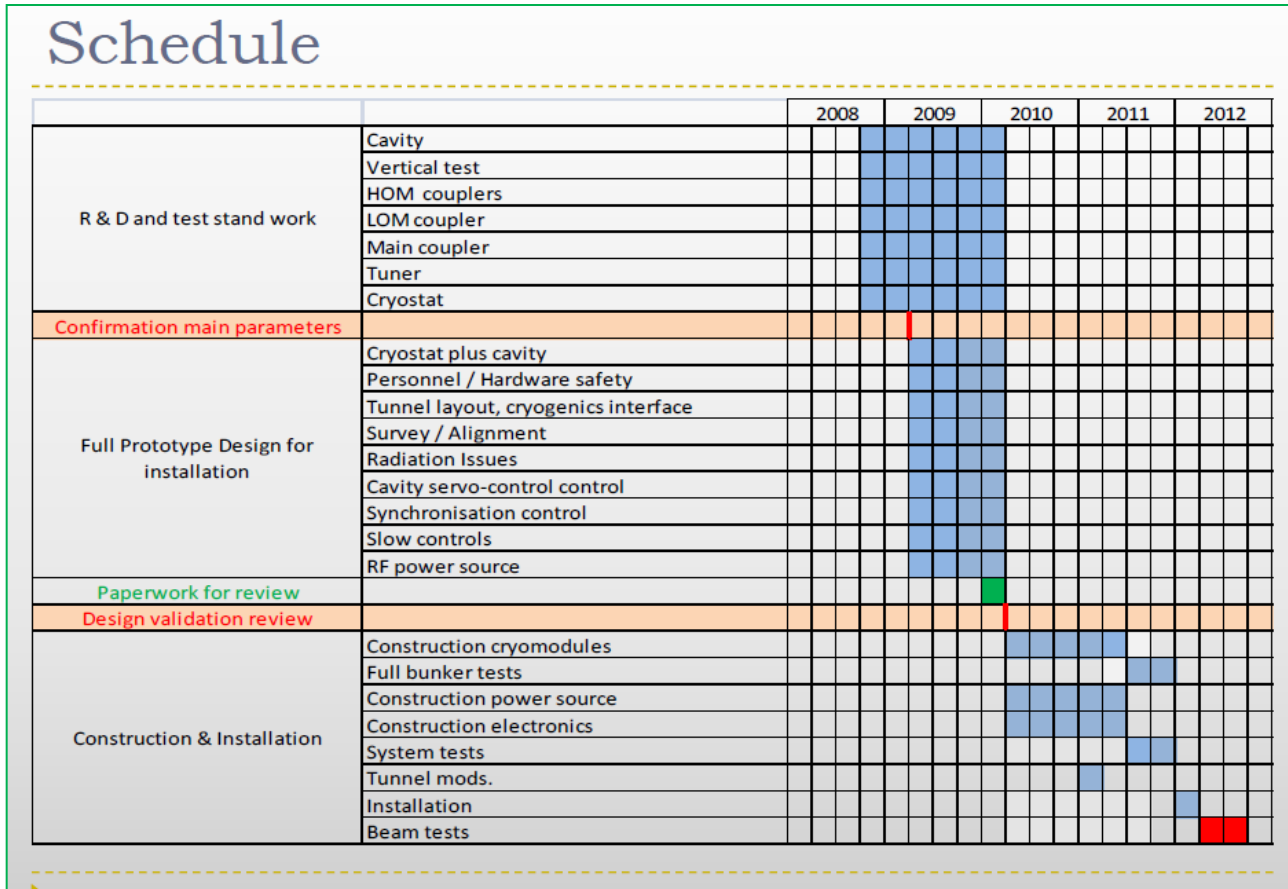


- 2008 Mini Workshop - reminder
- Activities & Planning
- Planning
- Remarks

“Proposal for LHC CC Design Review 2010” T. Linnecar et al.

## First questions

- ▶ What is the purpose of phase 0?
  - ▶ luminosity 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?



- Beam tests end 2012
- Now, LHC Phase 1 Upgrade ‘Ultimate’ planned for 2013/2014 shut down



# LHC Crab Cavities – Schedule



Colour scheme				
Main critical Path	Red	Red	Red	Red
Critical activity	Orange	Orange	Orange	Orange
Critical - needs to fit in LHC shutdowns	Yellow	Yellow	Yellow	Yellow
Non-critical - if resources available!	Green	Green	Green	Green

Activity/Workpackage	2009	2010	2011	2012	2013	2014	2015 on
<b>Phase 1</b>							
Cavity "Down Selection"	Red						
Final design proposal "CDR", approval		Red					
Finalize a Cavity Design, prepare specs for manufacture		Red					
Cavity & He tank construction (SBIR model) 2 yrs (including all RF tests, tuning, Q vs E measures)		Red	Red	Red	Red		
Cryostat Design, studies, drawings safety approval etc.		Orange					
Cryostat Construction (1.5 yrs min)		Orange	Orange	Orange	Orange		
Coupler Design & construction		Orange	Orange	Orange	Orange		
HOM coupler design & construction & test		Orange	Orange	Orange	Orange		
Tuner design and construction		Orange	Orange	Orange	Orange		
QRL & Cryogenics (2K) install (10 weeks) + commission		Yellow	Yellow	Yellow			
Preparation/commissioning of test area SM18		Green	Green	Green			
Full power tests, conditioning, measurement in SM18					Red		
Tunnel Installation of RFpower, electronics, infrastructure		Yellow	Yellow	Yellow			
Hardware commissioning in LHC						Red	
<b>Beam Commissioning &amp; Validation</b>						Red	



- Phase 1 - Not easy for 2013/14 shutdown (approval & other milestones – planning at limit)
- Availability of space in P4 a concern (200 MHz & additional damper may both be needed)
- Another concern: Installation and commissioning of a new crab cavity after just after Phase 1 installation, in view of commissioning which this upgrade itself needs.
- Need to start compact design for Phase 2/Global before validation with beam in Phase 1 in order to manage in a reasonable time...
- Implies double development – elliptical and compact at the same time (costly!)
- **Should we concentrate on compact design only, but plan for installation and beam test later than 2013/2014, in IR4 or IR1/IR5, after Phase 1 IR upgrade complete & commissioned ?**