



DISCUSSION: SUPER CYCLE MANAGEMENT ACROSS MACHINES

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LHC requirement

- Until now “Parallel filling”
- Probe (Pilot) beam
- Intermediate intensity 50 ns beam with 12 bunches.
- Full blown 50 ns beam with 36 bunches



What is the issue ?

- We have multiple **Sequences** that can contain several **Super Cycles**, which all need to be coherent.
- Each change in the super cycle needs to be followed up in PSB, PS and SPS
 - Redistribute cycles to take into account promised ratio's
 - Any change needs to be propagates in all the super cycles than can be executed (up to 7 or 8 super cycles)
 - Take into account specific spacing requirements
 - SPS MD's with coasts are very demanding....
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- **Sometimes 80% of the time of one person on shift in the PS complex is only used to change super cycles**

Sequences & Super Cycles

4xCNGS1-LHC2 (12 Bunches) -phase 0/1/2	Pulse Start - Phase 0/1/2 SFT Long2 - 2xCNGS-L... Pulse Stop - Phase 0/1/2	LHC2 50ns 12 bunches
4xCNGS1-LHC2 (36 Bunches) -phase 0/1/2	Pulse Start - Phase 0/1/2 SFTLong2 - 2xCNGS - ... Pulse Stop - Phase 0/1/2	LHC2 50ns 36 bunches
4xCNGS1-LHC4 for Vdm scan -phase 0/1/2	Pulse Start - Phase 0/1/2 SFTLONG2-MD1-2xCN... Pulse Stop - Phase 0/1/2	LHC4 with 4 batches of LHCINDIV
CNGS, LH3 25ns, LHCFast3 25ns phase 0/1/2	Pulse Start - Phase 0/1/2 Dedicated LHC4inj Pulse Stop - Phase 0/1/2	
Cycle coastable 15 Bp LHCMD1 0/1/2	Pulse Start - Phase 0/1/2 LHCMD1 Coastable 15B... Coastpr1 15Bp 0/1/2 Coast1 15 Bp 0/1/2 Coastre1 15 Bp 0/1/2 Pulse Stop - Phase 0/1/2	Cycle MD_26_120_18000_2009_V1
Cycle coastable 15 Bp LHCMDION 0/3/4	Pulse Start - Phase 0/3/4 LHCMDION 0/3/4 COASTPR2 0/3/4 COAST2 0/3/4 COASTRE2 0/3/4 Pulse Stop - Phase 0/3/4	Cycle setting:MD_ION_4inj_FT2000_...
Cycle coastable 26 Bp LHCMD2 0/1/2	Pulse Start - Phase 0/1/2 LHCMD2 Coastable 26 ... Coastpr2 26 Bp 0/1/2 Coast2 26 Bp 0/1/2 Coastre2 26 Bp 0/1/2 Pulse Stop - Phase 0/1/2	Cycle MD_25.92_55_270_2009_V1

1 super cycles per sequence to edit

4 super cycles per sequence to edit

- Many Sequences
- Many super cycles



SPS Normal/Spare for the LHC

- For the startup 2012 the SPS will be able to make use of **normal** and **spare** for the LHC filling.
- The sequences for the 12 bunch and the 36 bunch 50 ns beams will be combined in one.
 - One sequence less, as Probe will still be a separate sequence.



(Provocative) Discussion Points

- Leave like it is....
- Dedicated filling....
- Simplification in sequences and super cycles
- Fixed super cycle length
- More rigid planning and commitment to respect it
 - Dedicated setting up period for LHC MD preparation, etc.
- Modifications to CBCM

Up to you now....