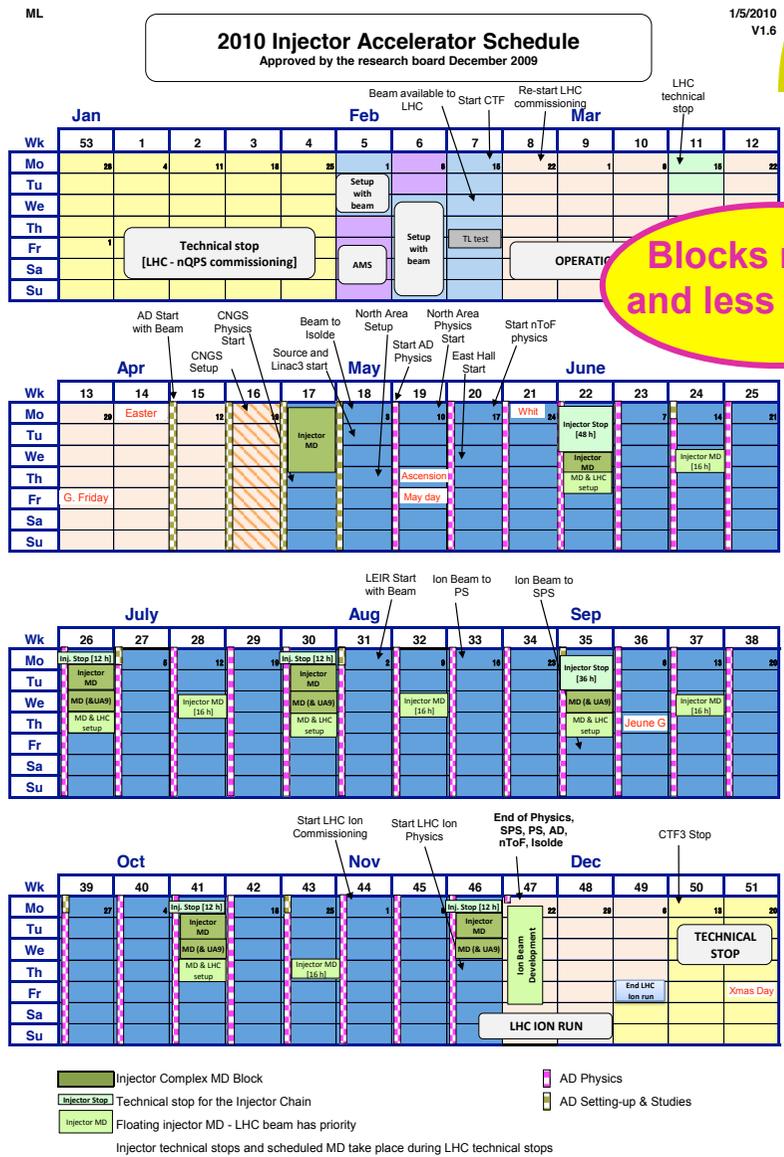


STRATEGY FOR MACHINE DEVELOPMENT STUDIES IN 2010 – UPDATE SINCE 12/05/2010

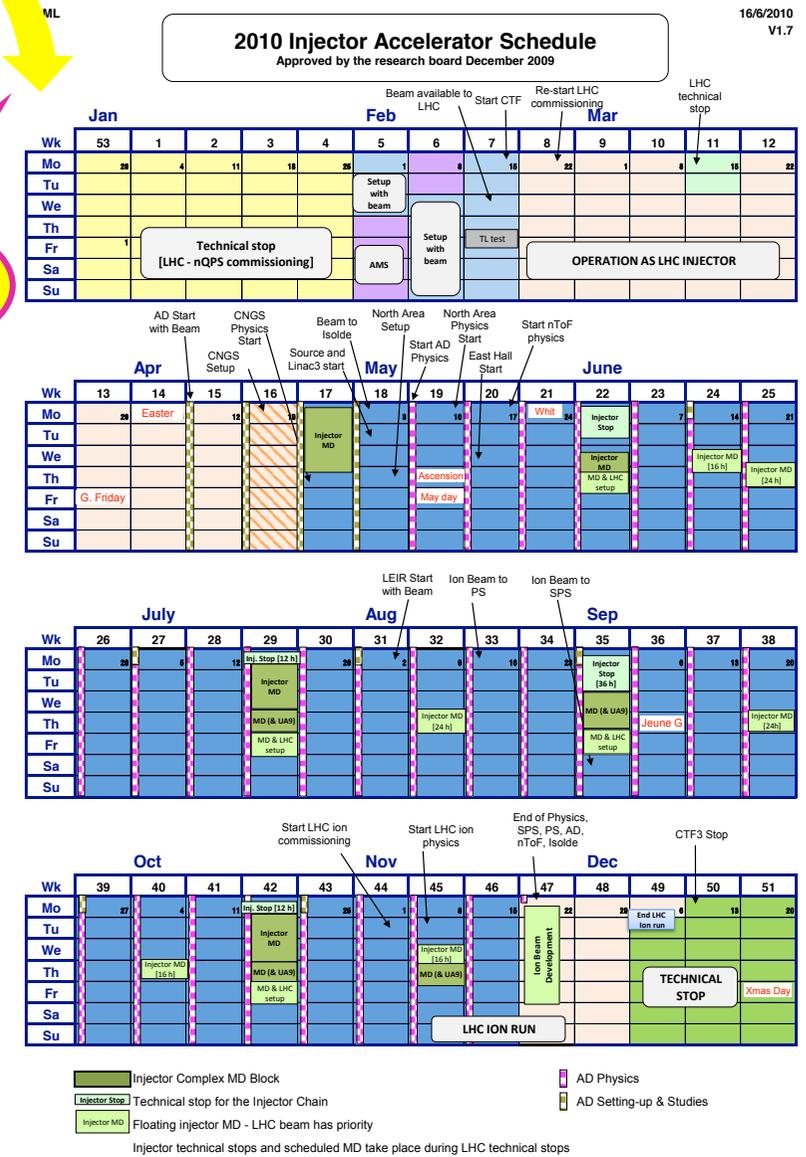
E. Métral

- ◆ This talk should have been given on 12/05/2010 => See: https://ab-mgt-md-users.web.cern.ch/ab-mgt-md-users/2010/StrategyForMachineDevelopmentStudiesIn2010_IEFC_12-05-10.pdf
- ◆ Update since then

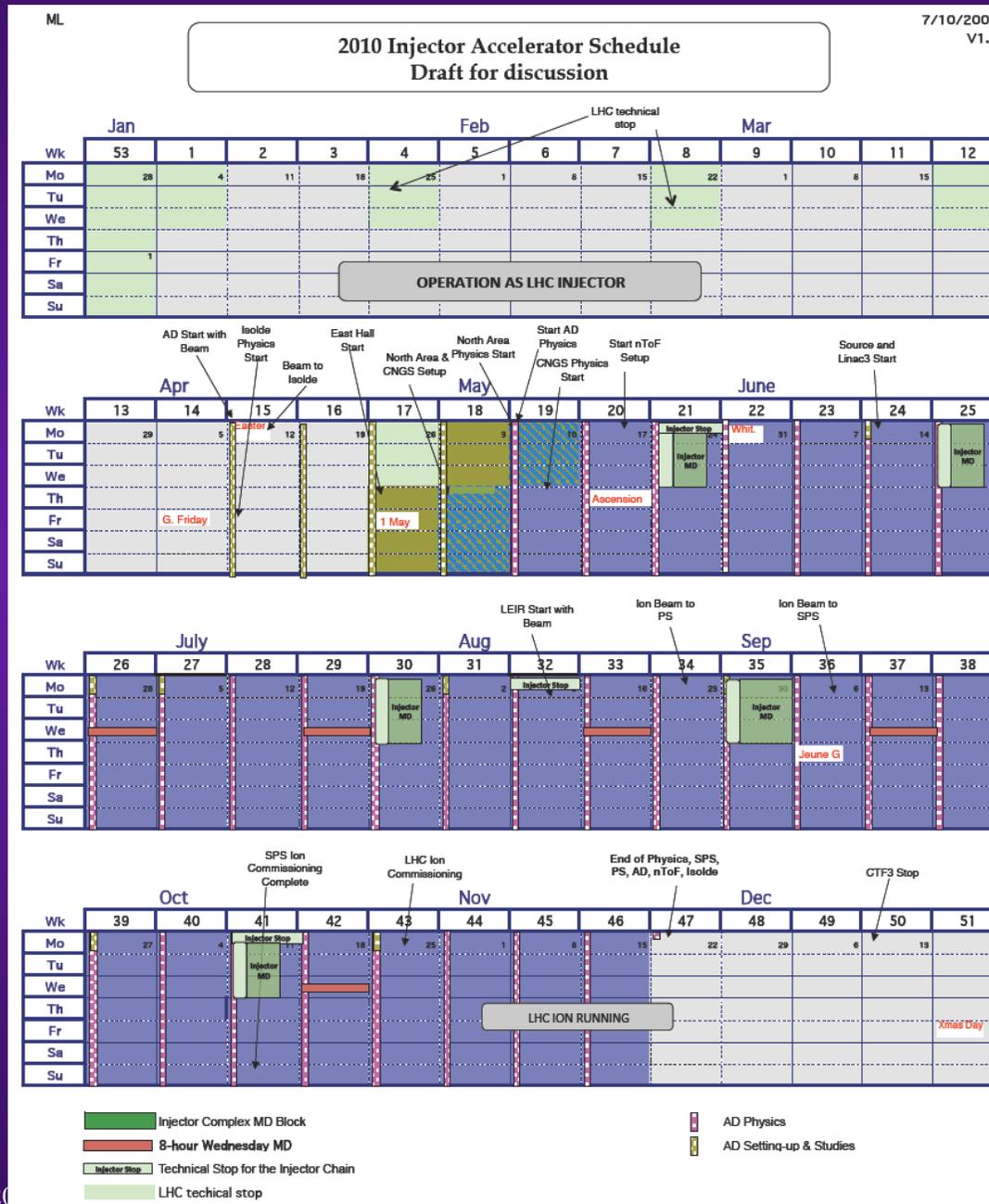
2010 INJECTOR ACCELERATOR SCHEDULE: V1.7 vs. V1.6



Blocks moved and less MD time



REMINDER ON THE 2010 SCHEDULE V1.1



LHC INJECTORS' MD TIME (1/2)

- ◆ **Each year is special but this one is certainly more special than the others (let's see next years!): LHC mastership => Many changes of schedule (issues with vacation etc.) + MD time lost in the changes of schedule's version**
- ◆ **Several days lost due to SPS magnets' changes:**
 - MD time used for the exchange
 - MD time lost at the beginning of the real MD due to outgassing!
- ◆ **Ion MDs + commissioning + Fragmented ion beam test for NA61**

=> MORE MD TIME IS NEEDED (in particular for high intensity and ecloud studies and ions)! => We would like to add (at least) 1 block of 10 h in week 44 and 1 block of 10 h in week 46 for the ions

LHC INJECTORS' MD TIME (2/2)

- ◆ **The LHC Technical Stop of week 35 was under discussion at the last FOM => Proposition from the LHC to remove it, but this MD is absolutely crucial for the SPS Upgrade studies (Elena Chapochnikova)** since important decisions about SPS coating in 2010/2011 shutdown should be taken already at the end of this year to allow one year of preparation. For these studies we need 3 newly coated MBB magnets to be installed in the ring. One of them is already prepared and 2 other will be ready in two weeks. We need these 3 magnets to perform two different types of measurements – dynamic pressure (2 MBBs) and microwave transmission (1 MBB). These magnets are coated in the different way (with magnet opening) than those installed in 2009. 48 hours minimum are required for their installation. Then the LHCbeam with 25 ns spacing is needed for the tests themselves. We also must have these magnets in the ring as long as possible for ageing test, but already very little time is left till the end of the year... Another planned intervention which requires 24 hours is the installation of the St St liners for the direct e-cloud measurements. Without this diagnostics all other planned e-cloud tests (e.g. 50 ns spacing with ultimate intensity) are practically impossible

THE 150 NS BEAM (1/3)

- ◆ **Email from P. Collier on 13/05/2010 =>** Look into the feasibility of providing such a beam for the LHC with NOMINAL bunch intensity through the MSWG
- ◆ **There were some discussions already in the past on the 150 ns beam but this was for a “new request from ALICE”** (https://ab-mgt-md-users.web.cern.ch/ab-mgt-md-users/2009/StrategyForMachineDevelopmentStudiesIn2009_IEFC_17-04-09.pdf) **and only ~ 1/3 or ~ 1/2 of the nominal intensity was requested =>** In the new request above, the ~ nominal intensity is required!
- ◆ **MDs foreseen in the PSB-PS in week 23 starting on 07/06/2010** (<https://ab-mgt-md-users.web.cern.ch/ab-mgt-md-users/2010/pmd23.htm>)
- ◆ **MDs foreseen in the SPS in week 24 starting on 14/06/2010** (<https://ab-mgt-md-users.web.cern.ch/ab-mgt-md-users/2010/pmd24.htm>)

THE 150 NS BEAM (2/3)

- ◆ See LMC of 07/07/10 and last MSWG meeting where the results were presented for 80% of the nominal intensity (above this, the beam is longitudinally unstable in the PS)

CONCLUSION AND POSSIBLE NEXT STEP

- ◆ 12 bunches spaced by 150 ns have been produced in the PS with $\sim 2/3$ of the nominal intensity (i.e. $\sim 8E10$ p/b) and kept in the SPS until extraction:
 - Concerning the longitudinal plane, the most reproducible conditions at top energy with TWC800 on and blow-up off/on were
 - a) blow-up off, TWC800 on: min: 1.2 ns, max: 1.3 ns - 1.4 ns
 - b) blow-up on, TWC800 on: min: 1.55 ns, max: 1.65 ns - 1.70 ns
 - The transverse emittances at top energy were ~ 1 -1.5 microm (rms, norm)
- ◆ POSSIBLE NEXT STEP: Since the SPS anyway will need to blow up this beam, we should have a joint MD to see what level of beam quality degradation can be tolerated (with a larger longitudinal emittance in the PS the beam intensity can be increased but then we have to check the injection process in the SPS...)

THE 150 NS BEAM (3/3)

- ◆ **This beam was taken at the beginning of the week with nominal intensity in the following 2 cases:** with a longitudinal instability in the PS **and** with a controlled longitudinal emittance increase in the PS to stabilize the beam
 - ◆ **It seems (from preliminary analysis by Thomas Bohl) that both cases were very similar and that the nominal intensity was reached at 450 GeV/c with satellites smaller than 1%**
- => To be confirmed by Thomas Bohl (and the LHC, for the satellites) but it seems that this beam could be sent to the LHC!**

MD COORDINATOR CHANGE

- ◆ **Giovanni Rumolo is the new MD coordinator since July 1st**

UA9 STUDIES

- ◆ **Email from W. Scandale: ... the first SPS run of UA9 in 2010 was a great success. Thanks to the effort of the MD coordinator and of the OP-teams the beam was delivered on time and with the right properties for our need. This was a precious and very appreciated support...**

MANY SUCCESSFUL MDS

- ◆ **LHC50ns ultimate beam at PS extraction!; ~ Ultimate LHC25ns beam injected for the 1st time in the SPS (with larger transverse emittances... many issues to be solved in the SPS...); A single bunch > 3E11 p/b can be sent to the SPS and is being studied (TMCI); PSB ring 4 instability solved and more intensity is now sent to ISOLDE...**