29/08/2017

(r)MPP meeting: Approval of MDs for MD block#3 in 2017

Present: J. Uythoven, M.Zerlauth, D.Wollmann, J.Wenninger, C. Schwick, R. Tomas, G.Iadarola, C. Bracco, M.Valette, F.S.Carlier

The meeting aimed at a discussion and approval of the MDs classified as class 'C' by MP. The slides presented are available on the following Indico site:
https://indico.cern.ch/event/661912/

M.Zerlauth briefly presented the LHC schedule and the details of the MD3 block. Comments and clarifications required to the different MDs can be found at here. A few minor comments and questions will be sent directly to those concerned. Few MDs were treated in detail at this meeting.

MD 2484 - 8b4e and other MDs (G.Iadarola) - Slides

- Large bunch intensities are to be used for 8b4e, up to 1.6E11p/b however total intensity will not exceed 3e14 p+/beam, which is a similar value as used in normal operation.
- Intensity ramp-up: 100b -- 600 b -- 1900 b. 1900 b might be limited due to beam dump block and the N2 leak (currently operating at 1550 bunches with nominal bunch intensities). The final allowable number of bunches will depend on the state of the N2 at the moment of the MD.
  D. Wollmann commented that one might want to adjust the filling pattern to avoid hot spots on the TDE block if the machine is not completely full.
- There is an interest to start first tests with 8b4e before the MD block with nominal bunch intensities. If not done before the MD, which tests would need to be done before starting the MD? If 8b4e already tested during normal operation, no special test for orbit required at the MD. If nominal intensity not tried before the MD, go straight to 1.6e11 p+. The list of checks before/during MD should include:
  - TDE N2
  - Orbit – if not done already with 8b4e
  - ADT settings exist
  - RF team: already confirmed that no changes are required, phase loop OK also with full detuning.
  - BI should be OK
  - Increase octupole currents
- While the 100b fill will be divided to the high-pileup test, the 600b fill might be used at the end of beam-beam studies. Crossing angles IP1 and IP5 will be reduced in steps of 5 urad, at half of nominal speed. The minimum angle will be as in operation not be lower than 90 urad. Octupoles and Q' changes will be tried during the test. 90 urad is very small for high intensities and might imply some considerable losses, therefore it was agreed to declare stable beams only in the initial steps and switch to ADJUST around

120 urad. Data taking is not a priority in this fill and it will hence not be extended beyond the necessary program.

- OP scans of 100 b fill can also spoil the fill as they could lead to instabilities – therefore scans should only be done the end of this fill.
- For both ramp-up fills (100b and 600b), 4h in Stable beams should be targeted to observe the full extent of equipment heating.
- If time is left, the crossing angle can also be reduced in the last fill following the same procedure.

MD2162 Dynamic aperture (R. Tomas) - Slides

- Single pilot in one beam and 4 pilots in the other beam. Use of AC dipole only on beam with one pilot or when one pilot is left.
- Collimator settings not very precisely defined. Collimator settings for B1 should be coarse all the time. B2 coarse as well and at 40 cm opening the TCPs to 10.5 sigma and TCTs at 15 mm (which corresponds already to coarse settings).
- The achievable AC dipole kick was limited in power and forbidden to do large kicks at top energy. AC dipole managed to kick 4 – 5 sigma at top energy, but in any case always below 5 sigma. In procedure, a 10 sigma kick is mentioned, the phrasing should be verified and corrected accordingly.

M**D 2410 - Beta* levelling – (J.Wenninger)** - Slides

- Collimator input still missing, this is the case for many MDs as several key people of COLL are absent. Roderik will be back on Wednesday and should be able to help clarifying.
- The MD will for a first-time test levelling with the telescopic optics. New and full controls implementation can only be tested for MD4, this first verification will be mostly done manually.
- The MD aims at the preparation of possible operation with beta* levelling in 2018.
- While IP1 and IP5 are more straight forward, the tricky part is in IP2 and IP8 where lumi is to be levelled. This would require maintaining an orbit tolerance of about 1 um, which will only work if the OFB will be able to control this efficiently. Complex also due to telescopic part around these IPs.
- 3 bunches per beam will be used throughout the nominal cycle. Step through squeeze to 30 cm in 3 steps with beams in collision.
- Open points:
    - Will 30 cm become operational? If not, this needs further setting up. Optics corrections at 30 cm have never been replayed.
    - TCT centre will not change, but adapt to beam size. To be determined with the collimation team.
    - New reconstruction determination of beta* from quad currents in SIS should be working in tele mode up to 30 cm (prepared and first to be tested during ATS MD).

- Small change in TCDQ, but not significant for test with 3 bunches. Therefore only TCTs will be modified for this MD.

AOB

MD of firing of quench heaters on the triplet was presented in MP3. As a result of this, MP3 requested to do this MD only at the very end of the 2017 run to minimise risks of losing heaters for normal operation or similar hardware problems. The test requires about 2 hours at injection, so it can also be done outside the MD block, before the end of the run. In parallel, the requestors should check for previous occasions of heater firing during normal operation, to determine if experimental data does not already exist.

Reported by J.Uythoven and M.Zerlauth