

MPP meeting 5 February 2010

Agenda:

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- First experience with abort gap monitoring and cleaning (M. Meddahi)
- Follow up from Evian and Chamonix (J. Wenninger)
- Intensity increase in 2010 - draft plan (J. Wenninger)
- AOB

Present:

Arjan Verweij, Laurette Ponce, Annika Nordt, Robert Appleby, Ruediger Schmidt, Antonio Di Mauro (Alice), Wolfgang Hofle, Benjamin Todd, Andrea Boccardi, Stephane Bart Pedersen, Brennan Goddard, Mike Lamont, Mariusz Sapinski, Christoph Kurfuerst, Thibaut Lefevre, Stephano Redaelli, Enrico Bravin, Richard Jacobsson (LHCb), Siegfried Wenig (ATLAS), Eva Barbara Holzer, Bernd Dehning, Andrzej Siemko, Bruno Puccio, Jan Uythoven, Massimiliano Ferro-Luzzi, Markus Zerlauth, Malika Meddahi, Jorg Wenninger, Mike Koratzinos

Minutes:

Abort gap cleaning tests (Malika)

Malika presented the outcome of abort gap cleaning tests performed in December.

Test 1: cleaning of a bunched beam: result: procedure very effective; even with the smallest kick amplitude beam is lost in a few minutes. Next step is to check cleaning time against a model. Test is automatic.

Test2: cleaning of a 3 us gap between two bunches: large losses of downstream bunch. Eventually after tuning the result was better but surrounding bunches are still affected. To do: optimization (need to correct the phases of all amplifiers in the loop).

Test 3: cleaning of debunched beam. Window of .75usec cleaned but outside window still a bit of beam left (as can be seen in mountain range graph). To check: increase the kick (amplitude or duration) to see if cleaning improves

Abort gap monitor: BSRA is a synchrotron light based monitor. (need the undulators below 1.2TeV, but are useless above 1.3TeV. Nevertheless, it was decided in Evian to leave them on). BSRA needs to be calibrated and checked.

Proposal for interlock: monitor abort gap continuously with the BSRA. Continuous cleaning. Software interlock if population gets above a threshold. If the BSRA is not functioning the idea is not to dump the beam but rely on TCDQ to protect from losses. Operational experience will allow us to fine-tune the strategy.

In summary, all systems working as needed. Functionality of the abort gap cleaning is demonstrated.

There followed some discussion on the interlocking proposal: The system is not designed to be interlocked, and if interlocking is needed the project should change scope. The machine should be safe against asynchronous beam dump anyway. However, we need to do everything to keep abort gap as clean as possible. Ruediger mentioned that interlocking will help but we should not implement it in a hurry. Ruediger also mentioned that if we have a different independent way to monitor the abort gap it would be useful. Richard said that the LHCb can easily provide the bucket numbers where they see some activity. Jorg said that an interlock strategy will be defined in due time. The discussion expanded on interlocks in general and if, for instance, we lose monitoring but interlocks still work. Jorg's idea would be not to dump the beam immediately but try to remedy the situation for a few minutes, then dump.

Follow up from Evian and Chamonix (J. Wenninger)

Jorg presented a series of points coming from presentations and discussions at Evian and Chamonix:

Miscellaneous: Velo position limits: document next week. SMP: will be discussed next week. Squeeze factor: Stephano found pairs of quads that are promising for normal operation but need to be checked for 'exotic' b^* values. Power cut tests: will be reviewed in the future. Ralph mentioned that the collimator system was fully satisfied with the (unprogrammed) glitch of power.

SIS: New injection interlock on the QPS_OK signal: block injection if QPS_OK =FALSE. But not dump the beam. This functionality can be masked; To avoid the problem with RF synchronization there is a new injection interlock on the RF TDCs.

BLM issues: 'Beam1' monitor for Q3/triplet protection installed on D1 systematically triggering when a pilot is send to the TDI. On inspection it was found that in LSS2 the BLM was installed ~20 cm above the beam line, while in LSS8 it was installed below the beam line (because of a RAMSES monitor). The LSS8 monitor moved to same position than LSS22 monitor.

BLMs 2nd issue: saturating BLMs on the TDI : The dynamic range of one monitor will be increased by a factor 100 (by pulse stretching). The other monitor will not be touched (for fast loss measurements).

Issue of large backgrounds in Alice during over-injection (dumped the beam on a TDI): will check for next MPP meeting.

Collimation BLMs saturation: currently they saturate well below the damage level. Ongoing discussions to address the issue.

LHCf: issues related to "DIP to CMW" servers. Need clear instruction of how to restart.

Wire scan limits: (Mariutz:) performing wire scans at 3.5TeV in the first phase should be no problem.

Energy tracking in the kickers: adapt the energy to the new LHC matching and reduce the tolerance of some kick voltages.

Test documentation: some systems document their test very well, some not so well. This should improve this year. Instead of dumping the beam at the end of a fill, do a machine interlock test every time.

Intensity increase in 2010 - draft plan (Jorg)

Jorg then talked about the strategy for increasing intensity on 2010: a formal proposal will need to be made in the near future; this is the first draft for discussion: Jorg proposes a series of steps in intensity going up by factors of 2 every time, reaching about 40 bunches with 5×10^{10} protons each.

Jorg showed a first draft of a table with a possible scheme starting with 4 pilots. When we eventually go to trains go to 4 trains of 12 bunches (with a crossing angle). Approximate run time per step 2 weeks: this means 10 fills minimum if no problems or longer if there are things to understand. In this plan we will reach a luminosity of 5×10^{30} after 3 months of running with b^* of 2m. The stored energy will be then 1MJoule. Massi remarked that we should explore the region above 5×10^{10} protons per bunch (up to 2×10^{11} if possible). Ralph commented that the test plan should show the roadmap to 30MJ stored energy. There was some discussion on the draft.

AOB: Proposed system changes for the BLM system (Barbara)

Barbara started discussing the proposed system changes (dynamic range issues) for the BLM system. The meeting was continued as a meeting of experts who will report on what was decided at a future date.