Quench Test Strategy Working Group

Date: 18th January 2013

Chairperson: Mariusz Sapinski

Scientific secretary: Agnieszka Priebe

Presentations:

- Mariusz Sapinski “Latest news concerning planning, status of EDMS documents”
- Eduardo Nebot Del Busto ”BLM threshold changes needed for all tests”
- Agnieszka Priebe "Preparation of the fast loss quench test "

Minutes:

- **Mariusz Sapinski “Latest news concerning planning, status of EDMS documents”**

  M. Sapinski presented a plan of upcoming meetings, presentations and test before the 48 h Quench Test slot. The order of Quench Tests (QTs) was discussed. It was said that the Fast Losses Quench Test (MKQ+ADT+3-corrector orbital bump) and the Quench Test on collimators with protons have the highest priority. Nevertheless due to the ion run schedule the Collimator Quench Test with ions should be done first. The Steady State Quench Test done using 3-orbital bump technique is equivalent to the QT on the collimators (with protons). Both of them will prove the quench limit in the same timescale (seconds). D. Wollmann noticed that the QT with ions was the most complicated regarding the BLM threshold settings. M. Sapinski asked people responsible for QTs to provide minimum and maximum values of ramps needed for each experiment. D. Wollmann pointed out that one additional ramp was needed for the collimator test to scale the ADT settings. M.Sapinski presented that during the Fast Losses QT octupoles should be set to zero and chromaticity should be set to small values. Although the beam would be lost in the horizontal plane, beam scraping would be done in the vertical plane to decrease the beam intensity. B. Holzer noted the possibility of coupling between both planes. T. Baer answered that the actions in the horizontal and vertical planes should be done very quickly, one by one. B. Holzer asked about an option of longitudinal beam loss and measurements of such small intensities. T. Baer said that each bunch would have different intensity. M. Sapinski explained that the vertical losses, provided by the beam blow up and scraping, were preferable due to the neutral particles propagation. R. Schmidt suggested defining the vertical beam size by collimators and then applying the beam blow-up. A. Lechner commented that it was better to shoot a larger beam onto the beam screen. T. Bear added that the collimators should be open before the beam excitation. R. Schmidt agreed with this statement.

- **Eduardo Nebot Del Busto ”BLM threshold changes needed for all tests”**

  E. Nebot del Busto initiated a discussion of possible BLM threshold changes during the QTs. D. Wollmann poited out that they would need more freedom (in IR7) for changing the BLM Monitor Factors. B. M. Salvachua Ferrando added that in 2011 quench test they used the "relaxed 2011" collimator settings which resulted in the cleaning inefficiency of 6.6e-4 at Q8 at 3.5TeV. For the 2013 quench test at 4TeV they evaluated which collimator settings should be used. They had the cleaning inefficiency of about 5e-5 for "tight" collimator settings and about 6.6e-4 for "relaxed" collimator settings. The last number needs to be confirmed at 4TeV but they expected it to be similar. At the end we prepared different collimator settings, more relaxed than the "relaxed 2011" and we achieved a cleaning ineffiency of 1e-3, but I think, this was decided after that meeting, in particular we tried the settings the 2nd Feb 2013. E. Nebot del Busto stressed the fact that all changes must have been kept as simple as possible. Master Thresholds should not be changed at the same time as the monitor factors. Moreover he added that usually beam dumps were triggered by lower BLM running sums (RS). B. M. Salvachua Ferrando said that loss maps would be done that day and they should learn about locations were the highest radiation occurred. D. Wollmann pointed out that a correlation between the ADT and excitation must have been known for the QT. D. Valuch answered that it would be the same as for the loss maps. M. Sapinski reminded the safety issue of Sector 7-8 in case of using beam 1. Beam 2 is considered safer in terms of the machine protection and Sector 6-7 is preferable. D. Wollmann said that ideally they would like to use both beams. It was stressed that no quench could be induced in Sector 7-8 during the ion QT because of worse quality of the splices. B. Dehning noted that the magnet recovery takes around 10-15 h, around 310-15 minutes are needed for the Post Mortem. T. Baer was afraid of reaching the BLM saturation level. He reminded that some time before this level was obtained with a pilot bunch at 450 GeV (5e9). M. Sapinski added that the safety must be provided in case of improper bunch gating or gating two bunches instead of one during the QT.

- **Agnieszka Priebe "Preparation of the fast loss quench test "**

  A. Priebe presented the updates of Fast Losses Quench Test preparations. Seven additional mobile BLMs had been installed in 12L6 to increase radiation dose resolution. Moreover a diamond detector was located there as well. In the close future it will be connected to a QPS oscilloscope to provide synchronization between the BLM and QPS systems. A. Jeff commented on possibility of beam intensity measurements regarding longitudinal density monitors (LDM). He said that 30 s were needed to take measurements but they would be able to see the beam losses of about 1e8-1e9. The LDM error is around 5% but, due to the beam blow-up, it can be higher. A. Jeff suggested also using the Abort Gap Monitors (AGMs) which provide bunch by bunch data acquisition but only of a single bunch (and it has to be changed manually). B. Dehning commented that Wire Scanner measurements of emittance could not be used for intensity estimations (amplitude is not linear and it was not tested). D. Wollmann pointed out that the changes of BPM interlock should be done in IP6.

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