

Minutes from the 41st BLM Threshold Working Group meeting – 02.08.16

Present: C. Bahamonde, W. Bartmann, C. Bracco, F. Burkart, B. Holzer, M. Kalliokoski, A. Mereghetti, S. Le Naour, M. Valette, C. Xu.

BLM measurements at collimators and the TDI in Fill 5074 (A. Mereghetti)

Slide 3: Dump was triggered by TCTPV, therefore not on L2 where the TDI is located but on R2.

Slide 4: Losses may have been induced by the upper jaw touching some beam halo, for example, with one of the two corners of the jaw (there is roughly 1 second of interval allowed for jaw movement).

Slide 5: When zooming in the loss profile (left plot), it is possible to see a slow rise over 200 ms and a 10 Hz modulation on the losses. From the right plot it is clear that we triggered the dump due to the integration of the loss profile and not due to a spike.

Slide 6: From the time evolution of BLM signals we can see that in both TDI and TCP BLMs, there was a slow increase before an abrupt change happened.

Slide 8: Based on the plot, *Alessio* thinks the TDI was intercepting the halo but not the primary halo, more like there was a vertical shift of the Closed Orbit that made the TDI behave as a secondary collimator. He also thinks the jaw angle positioning of the TDI could also have an influence.

As a curious thing, RS01 of the TDI BLMs showed more signal than that on the TCP in Point 7. *Barbara* wants to understand this, since her, *Chen* and *Matti* say the BLMs on the TDI all have filters. *Alessio* says the ones on the TCPs don't have a filter, although he will check this again because according to *Barbara* the losses on the TCP must absolutely be higher than on the TDI.

Alessio says he would like to know why the secondary halo could have piled up to produce this.

Chiara remarks that, in any case, the dedicated monitors in ALICE should take care that this phenomenon does not affect them.

Signals at ALICE BLMs in Fill 5074 vs threshold proposal (M. Kalliokoski)

This presentation will address the same phenomenon than *Alessio's* presentation did but focusing on what happened in ALICE BLMs meanwhile.

Slide 2: BLMs named _BKGD are placed at the top and bottom of the beam pipe.

Slide 4: Looking at RS01 losses, it is clear that in general there were no fast losses and specially not in the case of this event.

Slide 5: BCMs on ALICE have short RS so they might not see this phenomenon, while steady state losses are the highest since May. For this reason, RS07 should be the one used for triggering the dump instead.

Slide 6: There was a gap of 100 ms since the end of the TDI movement and the actual beam dump. First the BLM signals triggered the dump and shortly afterwards ALICE tripped.

Slide 7 and 8: *Matti* wonders how much more easily could have we dumped if we had set another threshold based on RS07.

Slide 9: This modification would split the losses in half.

Slide 10: Assuming background at 2% level.

Slide 11: From the plot it is possible to see that there were several loss scenarios in ALICE that didn't trigger a dump. *Alessio* points out that the LHC was in commissioning stage at the date of the plot.

Matti concludes that to protect against losses that last longer we could pick a threshold based on previous data and scale it up, so we still protect against UFOs but we're not constantly dumping or under warning. He'll talk to the ALICE responsible people on this subject when they get back from holidays.

First assessment of 2016 injection losses vs BLM thresholds in IR2/8 (C.Xu)

Chen looked on the losses on injection and compared them with current thresholds.

Slide 3: By normal families *Chen* means they're not related directly to injection, they're simply placed in a sensitive area. In IR2 there are 22 BLMs with a small filter and 1 with a large filter, while in IR8 there are 25 BLMs with a small filter and 1 with a large filter. Currently, large filters make loss signals down by a factor of 90. The dates of analysis correspond to a period that goes from right after commissioning to right before Machine Development. In general, point 2 Beam 1 monitors see the highest losses.

Slide 4: The blue framed parts mean those monitors are on the other side of the IP. If a value goes over 10% of the set threshold it will be shown in a plot, taking into account that the plots show always applied thresholds, not master table ones. *Chiara* points out the data should be scaled to 280 bunches and she says this analysis was already done in 2012, after the shielding was installed (installation happened during Christmas break 2010-2011).

Slide 5: During the next technical stop the monitors circled in red dashed line will change.

Point 2

Chiara says she would only change the TCTPV case. *Barbara* says there's at least one BLM that has a filter that shouldn't have it and she also says injection people should review the analysis and check if the current situation is what they'd like to have set.

Black dashed monitors on Slide 12 (THRI.IP28.P something) should be changed. *Wolfgang* says it would be interesting to see in how many fills does this happen loss pattern happen. He reminds that the TDI sees longitudinal losses and therefore everything downstream from it sees these sort of losses too, while upstream from the TDI transverse losses dominate. It was questioned if we actually need a filter on monitors in B0 position, since there's currently one installed.

Point 8

Barbara points out that in the past analysis it wasn't taken into account if the losses were too far away from the set threshold (therefore it wasn't checked if the thresholds should be lowered), it was only analyzed if the losses were coming too close to the thresholds in case there was a need to increase them. She also says the threshold requirements from the injection people should come before the next Technical Stop.