MPP meeting 16 September 2011

Original agenda:

1) Beam Intensity Interlock (DIDT) – Status report (M.Pfaudwadel)
2) Reactivation of ATLAS BCM – Experience with improved logic during 2011 run (H.Merritt) - **postponed**
3) Procedure in case of non-working dump trigger (M.Zerlauth)
4) AOB

Present:

Tobias Baer, Edward Nebot, Jan Uythoven, Etienne Carlier, Siegfried Wenig (Atlas), Lars Jensen, David Belohrad, Juan Carlos Allica, Alfonso Benot-Morell, Mike Lamont, Ben Todd, Stephane Gabourin, Ruediger Schmidt, Jorg Wenninger, Juan Blanco, Markus Zerlauth, Mike Koratzinos.

Minutes:

DIDT system (Mathias Pfauwadel)

Mathias gave us a status report of the DIDT system (or beam current change monitor). This is a redundant system being developed complementary to the BLMs to detect beam losses. In the near future it will only be used for monitoring, but later it is envisaged to be fully integrated as a (maskable) user input to into the beam interlock system.

It operates by measuring the intensity of all bunches in the machine as a function of time. Bunches come at 40MHz, the system uses 4 times oversampling (160MHz). It then calculates the total beam current and calculates the difference over 1,4,16,64,256,1024 turns. This difference is the losses. It then compares the losses to a predefined threshold (energy dependent). The total loss is an absolute number, not a relative percentage in order to avoid triggers on comparably small losses when operating with small beam intensities. There was some discussion as to how to calibrate the system. The critical part of the algorithm is in hardware. The acquisition is via Ethernet. The first version of the hardware exists – the final version will have 2 channels.

Preliminary planning is as follows: 1st October: analyze bunch result using FESA class; 15th October: modified FPGA for 2 channels; 7 November: installation of two boxes for both beams. End February 2012: final system. It was mentioned that an operational DIDT system cannot be promised for end February, although every effort will be made to have it ready.

Specifications: accuracy: 1% loss per turn easy (integrated over all bunches), 1 per mil possible – not easy to test in the lab.

Ruediger reminded us that such a system was the main protection system for Hera for many years. Markus urged to try and have things ready to get some experience this year.

What to do if dumping the beams does not work (Markus Zerlauth)

Markus presented the Emergency dump procedure. This procedure is to be used in case a dump does not work. (example: the CCC is running blind due to a power cut, the dump request being ignored due to some serious malfunction, etc.) Jorg started defining this in February. This procedure is a sequence of actions most of which have to be executed manually using guidance by an automated procedure (with a pop up to help the operator). Step 1: use the dump switch; Step 2: activate the AC dipole (using a key which is kept in the CCC) Step 3: power cycle the BIS in the CCR; Step 4: trigger the LBDS internally; Step 5: scrape the beam slowly while staying below the quench limit. Here one needs to be very careful though not to go above the quench limit; Step 6: power cycling the LBDS VME crates (forcing an asynchronous dump).

After discussion it was decided that step 6 should go before step 5. It was felt that step 5 has more risks in case a magnet quenches due to beam losses.

Medium term measures also include implementation of a direct dump switch in the CCC (this will be an asynchronous dump) and the implementation of a passive 'beam presence' monitor in the CCC (in case we lose all monitors for instance). Brennan remarked that we should be careful not to compromise the safety of the system elsewhere by solving this issue.

Document exists. Markus will try and circulate the document for comments in the next couple of weeks.

AOB: first dump trigger by the direct dump BLMs (Eduardo Nebot)

Eduardo showed the first instance of the direct dump BLMs giving a dump signal: Fill 2102, injection energy. This was an operator dump, but the direct dump signal would have dumped the beam if it would have not come second. Signals of the ICs and direct dump are similar within a factor of 2-3. The direct dump threshold was 20000 ADC counts, two monitors measured more than that (20500 and 25000).

AOB:

Ion run: Jorg (for information): most probably 100nsec separation (stored energy around 3 times more than last year), beta* in Alice of 1m is under discussion. The issue of opening (as during last years run) the TCTVs in order not to shadow the ZDC needs still to be approved -> Will be done in next weeks rMPP. Matteo: there is some discussion about changing the filling scheme so that bucket 1 collides in Alice (instead of Atlas). This would make a ~10% gain in Alice (as the abort gaps would not be “colliding” in Alice as much). No direct issue on MP of such change was brought forward.