

MPP meeting 5 December 2008

Agenda :

- Failure simulations of PCs and PIC configuration (B. Holzer)
- BLM system status and experience from 2008 (B. Dehning)
- AOB: news on SPS interlocks (J. Wenninger)

Present:

Bernd Dehning, Walter Venturini, Jorg Wenninger, Alick Macpherson, Stefano Redaelli, Laurette Ponce, Rayes Alemany, Daniela Macina, Robert Appleby, Rudiger Schmidt, Gianluigi Arduini, Bruno Puccio, Etienne Carlier, Jan Uythoven, Benjamin Todd, Verena Kain, Jim Strait, Mike Koratzinos,

Minutes:

B. Holzer: failure simulations

Bernhard has analysed quadrupole failures to come up with a list of which quadruples could be configured to be maskable (PIC-BIC connection) when starting the machine. His analysis is not intended as an operational tool and he does not look into the time dependence of a failure but rather calculates (analytically and also with MAD) tune shifts and beta changes. Agreement between his analytical calculations and MAD is within a percent of beta change. He comes with a list with quads in blue (meaning no problem) which in general are QTs and in red (meaning cannot be masked) which in general are the Qs. Next step is sextuples. This is a complex analysis and ideally suited as a thesis topic.

Discussion: it was pointed out that if a 60A orbit corrector trips, we do not dump the beam. Beam will be dumped only if there is a quench or very rapid orbit change. In a future meeting in February, Andres will present his thesis which deals with time-dependent failure scenarios.

B. Dehning: Status of BLMs

Bernd started by looking at the two beam quenches of September. It was pointed out that these were not "real" quenches in the sense that they would have 'healed' if there was no firing of heaters. A first question is what emittance to use. Verena mentioned that we have an emittance estimate: roughly $\frac{1}{2}$ the nominal emittance. Bernd expects that a factor of two in emittance is a factor of two in energy deposition and density due to the grazing incidence. The simulation predicts fewer losses than observed.

- Integration time: A small time window does not collect all charge – need a window of between 10-100msec to collecting everything. This has the result that for very fast losses, the effective threshold is higher.
- Upgrades: full reset capability to be added (known problem, although it has not affected operation up to now). Estimation of probability of false alarms: fellow position open. There will be a full test system commissioned in IP2. This will not be interlocked and will be used for software and hardware tests. Radiation-hard cables will be prepared for dump monitors as new simulation shows a factor of 10 more radiation than originally foreseen.
- LSA threshold data: Technical student will implement GUI. Concerning MCS (management of critical settings) comparison of hardware with database: the mechanism has worked.
- Timing problem: 1msec accuracy to be improved.
- Testing: modulation will be used to check the complete signal chain. Initialization using the sequencer: if a test fails, no beam permit will be given.
- Data volume logged: Measurement database: 30GB/day (0.5Hz logging rate). Logging database a factor of 40 lower. To be reviewed for 2009.
- The BLM PM system ready

Bernd drew our attention to the fact that the procedure to introduce a new BLM in the system is very complicated: 10 people and three DBs are involved. Can it be simplified? Bernd will bring this up to the DB review next week.

Bernhard asked if there is a warning to the operators when BLMs start registering losses: the answer is yes, there is colour coding.

Bernd stated that it is useful to define milestones for various parts of the project.

News (Joerg)

- MAC presentation received well.
- Specifications: BIC advanced, PIC FMCM ready.
- Beam quality interlocks at the SPS: timing: 20msec (currently) is a bit long as instabilities can develop in the mean time. For that reason the interlock signal will be connected to the SPS beam dump (i.e. ring BIS) and not to the extraction BIS.
- CNGS incident: 2MJ in vacuum chamber on 27 June. The beam was lost in the vertical plane where there is no position interlock (contrary to the horizontal plane). BI has agreed to develop a new turn-by-turn beam position interlock system for next year. It will be connected to a maskable SPS ring BIS input and it could hopefully be commissioned during the first part of the SPS run in 2009.
- Question : Should we invite experiments to the MPP? On a permanent basis? When needed?

Next meeting - AOB

Next meeting is next week. Also: Four persons from ITER are coming to CERN next week for a meeting on machine protection issues to be held 15/16 December 2008.