MPP meeting 18 September 2009

Original agenda:

Agenda:
- CMS permits (R. Hall-Wilton)
- Flexible energy window for SMP flags (B. Todd)
- First FMCM commissioning results (M Zerlauth)
- SIS interlocks on orbit and orbit correctors (J. Wenninger)
- Roman Pot operation in NO_BEAM mode (M. Deile)
- AOB

Present:

Andrzej Siemko, Mariusz Sapinski, Nicola Bacchetta, Richard Hall-Wilton, Richard Jacobsson (LHCb), Massimiliano Ferro-Luzzi, David Mcfarlane, Markus Zerlauth, Siegfried Wenig (ATLAS), Mario Deile, Alick Macpherson, Jim Strait, Benjamin Todd, Antonio Di Mauro (ALICE), AnniKa Nordt, Robert Appleby, Christos Zamantzas, Jorg Wenninger, Mike Koratzinos

Minutes:

Information (Jorg)

Jorg informed the meeting about various issues rising since last meeting:

- Apertures close to experimental regions are being revisited; ABP will sort things out. For example, alignment tolerances allow discrepancies of 15mm, not coming from initial alignment but from subsequent movement through time.
- BIS external review done. The auditors are a Canadian company who will write their report by 1 October. There will be a report in MPP in the near future.
- Hardware commissioning: in the near future a beam interlock meeting will follow HCC meetings. We need to decide what will be activated from the beam interlock system at the early stages of LHC running. The Beam dumping system has a lot of redundancy and we will start with a subsystem.

CMS permits (Richard Hall-WIlton)

Richard gave a summary of the BEAM_PERMIT from CMS, without discussing TOTEM who have their own system. This is designed to protect CMS from damage resulting from beam losses. There are three components to the CMS BEAM_PERMIT: Magnet (which is set always to TRUE); crash button at pt 5; beam condition monitors (BCMs) that are able to detect both fast and slow (>1sec) losses.

There are two BCMs: BCM2 at z=14meters, r=4.5cm 24 sensors in total; BCM1L at z=1.8meters, r=4.5cm 8 sensors in total. 4.5cm is approximately the inner radius of the pixel detector. Sensors are 1cm2 diamond detectors.

Abort strategy: any single diamond detector can trigger an abort; no coincidence is required. Up to three failed detectors (out of four) are allowed per side, i.e. system can work with only one functioning detector per side.

Initially the thresholds for BCM1L will be set to very high values. Thresholds for BCM2L: fast losses: trigger for single losses of about 10^6 particles; slow losses: threshold set at 3 times nominal luminosity (2×10^{34}).

INJRCTION_PERMIT: signals if CMS is in safe state for injection (until the post-mortem analysis from previous dump is understood). The system is able to take input from the BCM detectors, but this is not used in the current logic. Currently INJECTION_PERMIT will be held off manually until post mortem analysis is finished.

Systems was commissioned last year so should be fast to re-commission. There was some discussion as to from what date onward would the systems be considered 'live'. Jorg will organize a date to test everything (could be the 1 November). Alick will make sure that the machine Post Mortem data is propagated to the experiments at some future date.

Flexible energy windows for Safe machine parameters (Ben)

Ben reported on a proposal regarding the safe machine parameter (SMP) flags STABLE_BEAMS and MOVEABLE_DEVICES. The SMP has redundant energy and intensity inputs and it outputs flags either directly or through GMT. The SPS uses the same system. STABLE_BEAMS is true when MODE_LHC = "STABLE" and the LHC energy is within predefined bounds. MOVABLE_DEVICES_ALLOWED_IN is true in the above case and also when the MODE_LHC = "UNSTABLE". These are two of the 22 possible MODE_LHC modes. Currently the energy bounds are written directly in the hardware and need an expert to change. The proposal is to keep wide hardware limits, plus more strict software limits, enforced by software rules (for instance, higher-lower energy = 20GeV).

Roman pot operation in NO_BEAM mode (Mario)

In the original Roman Pot (RP) operation logic diagram, NO_BEAM mode sets DEVICE_ALLOWED = FALSE which means that the RP cannot be operated. Various solutions were presented to allow RP operation with no beam. Jorg suggested to discuss possible solutions off line. (He also reminded the meeting that NO_BEAM beam mode was never used at LEP.)

First FMCM commissioning results (Markus)

Markus presented the results from commissioning a number of Fast Magnet Current Change Monitors (FMCMs): on top of 14 units already commissioned and in operation for some two years in TI2, TI8/CNGS, 12 additional FMCMs were installed in non-superconducting circuits of the LHC. The functionality of these units is slightly different than that of the transfer lines. They need to detect changes of $3.5*10^{-4}$ in less than 1ms. The first tests and dry runs performed in IR2 successfully validated the first version of sequences and the FMCMs performed as expected (tests comprised ramping, artificially provoking a converter fault and measuring trigger delays). For operation in the future, thresholds will probably be relaxed slightly in favour of stability. A pleasant surprise from the tests was that the WIC reacts before the FMCMs. Documentation exists on the sharepoint site of the machine protection group.