Introduction: Roman Pots and Machine Protection

- There were several issues with Roman Pots, some around since some time, culminating in an ‘incident’ Sunday, 6/11/2011
  - Roman Pots do not move when requested to do so. Commands must be repeated (ALFA & TOTEM). A priori a controls issue, but does not inspire confidence…
  - RPs stuck due to PXI problem (ALFA)
  - Incoherence between requested positions and LVDTs, move towards the beam instead of away from the beam...
  - Issues with position reset procedure.
  - Roman pots that are not in the shadow of the collimation system
- For future (high luminosity) operation with RP in physics settings this is not acceptable – we have to take these warnings seriously.
- It was suggested to organize a meeting where issues related to Roman Pot movements are discussed
  - soon, to have the option for improvements during the Xmas stop, if required

Risks

- Roman pots move into (high intensity) beam
  - If the same happens with a primary collimator, other collimators would catch most of the protons
  - For Roman pots, the protons will be directly scattered into the cold part of the LHC – the consequence might be quenching of magnets (with a certain risk of openings an interconnect before consolidation)
  - Normally, this should be detected by beam loss monitors
- Roman pots are in a wrong position (not respecting the collimation hierarchy, not in the shadow of the collimation system, in particular of the TCDQ /TCSG)
  - This might not be detected during normal operation
  - During an asynchronous beam dump bunches can hit the pots
  - During a regular beam dump particles in the abort gap can hit the pots
  - Worst case is a hole in the pot, loss of vacuum, …
  - Positioning very delicate for the H plane, less critical for the V plane
  - Depends on gap of the Roman pots –small gaps are more critical

Protection

- Collimation system correctly set-up (validated with loss maps)
- Interlocks that prevent Roman pots moving into the beam
- Beam loss monitors will detect beam losses and are expected to dump the beam in time
- Beam position monitoring to prevent that the orbit moves away from the center of the pots

Objective of the workshop: Review RP operation until today with the aim to identify possible improvements for the interlocking of the Roman Pots (e.g. redundant position reading, flaws in SW/controls, test procedures,…) to be implemented for 2012 start-up

Agenda

- Introduction to meeting – 10 min (J.Wenninger/M.Zerlauth/R.Schmidt)
- Status of the FLUKA machine models from the RP locations to the DS for IP1 and IP5. – 10 min (V. Boccone)
- Description of the HW system – 20 min (M.Deile)
- Software and Controls for RP – 20 min (S. Ravat)
- Operational procedures and observations – 20 min (S.Redaelli)
- How to use the Roman Pots in 2012 and beyond? - 10 min each for a total of 20 min (P.Fassnacht/M.Deile)
- Summary / Discussion of next steps