Machine Protection Workshop

11th-13th April 2005 http://lhc-mp-review.web.cern.ch/lhc-mp-review/
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Here : some main points of interest and follow-up relevant for us

(my own partial view. To be complemented by Ralph, Stefano, Oliver, John, Alex.. who attended at least part time)

- reliable beam dump crucial with safe energy tracking to 0.5 % to provide the correct kick

- LHC to some extend auto-protected for slower losses (~100ms), quenching well before damage

- potentially very dangerous : fast losses < 100 turns
  rely on loss monitors + beam dump on few turns (1turn is 89 μs)
  injection : single nominal injection about 20 times above damage level
  3.3e13 protons (288 bunches of 1.15e11), damage at ~ 2.e12

some potentially very dangerous sources for short term losses include

- injection : relies on active and passive protection with tight tolerances.
  power converter surveillance, transfer line collimators (TCDI) and LHC injection protection with the TDI which goes out after injection, make sure mode well known, move in stoppes in TI2/8 ?
  many tough questions after Verenas talk: is it reasonable to discuss with fractions of σ ? β-beat,. ..
  what happens if n-th bunch or batch far off in emittance, angle, position ..., energy error SPS/LHC..
  our reply: σ is used as unit of physical aperture, from 3-3.5 σ scraping in the SPS, ~5 σ in the transfer lines to 7.5 σ aperture in the LHC, regular check of energy match with at low intensity, commissioning in steps, needs close follow up (tomorrow InjWG TI2, LTC with me on scrapers..)

- kickers - tune kicker (Jan Uythoven) - in desing stage, maximum 1.75 σ at 450 GeV
  aperture kicker considered to be extremely dangerous - suggested to use other methods to measure the dynamic aperture

- damper, (hardware by rf-group, W. Höfle) , needed to damp injection oscillations, possible multi-bunch instabilities, abort gap cleaning, PLL ?
  rf-group : delivers hardware, follow up generally limited to longitudinal plane
  damper use /spec / simulations / commissioning in transverse plane needs follow up --> ABP

- fast moveable objects, sector valves, control roman pots from machine control room, ...