AOBs LMC 16.06.2008

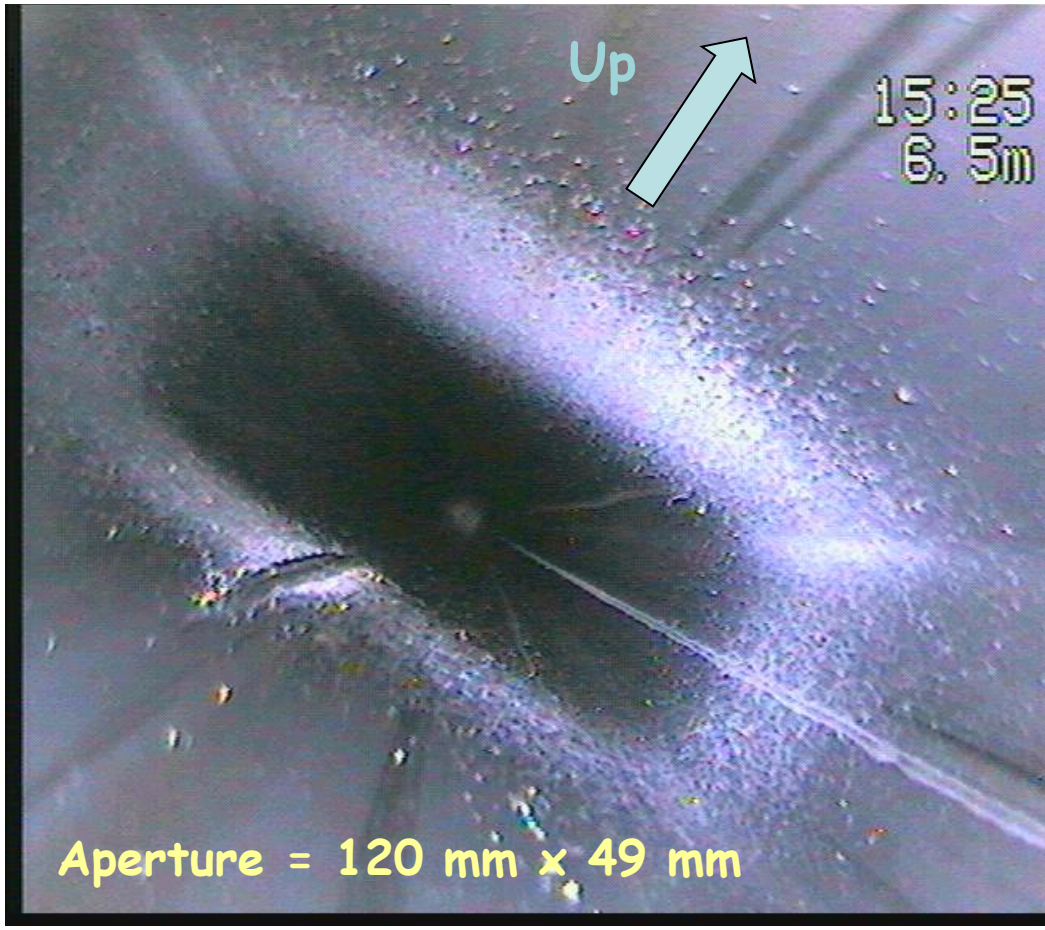
A near miss…

Continuous losses at a low level (few mGray/cycle) in SPS cell 621 (downstream from LHC ring1 extraction) triggered an inspection the magnets around the area.

Dipole MBB.62130 was found with an impressive 'scar'.

- Near miss in 2008 or 2009.
- Once more in the V plane.

- The magnet will be exchanged since the vacuum chamber is damaged and possibly deformed.
- The source of losses was not fully identified:
  - Losses reduced with V bump >> maybe the vacuum chamber or alignment of the MBB.
  - In H there is probably also an obstacle upstream, since there are losses during slow extraction



New beam position interlocks at SPS

- BI is designing a new 'dual purpose' SPS position interlock system:
  - Interlock of closed orbit before extraction (replace existing interlock).
  - H+V turn-by-turn position interlock for the ring (presently only H).
- System will be installed in LSS4 and LSS6:
  - 3 BPMs with H+V in positions 417,418,419 and 617,618,619.
  - Turn-by-turn based on LSS6 BPMs (V only), to be moved to better location later.
  - BPMs signals are split for new interlock + existing orbit system (MOPOS).
- Advantage of the new system:
  - No gains (log amplifier).
  - No delays for gates (auto-trigger).
  - Decision at -20 ms instead of -60 ms with respect to extraction time.
  - Linear : non-linearity of electronics compensates non-linearity of BPMs – no need for fancy correction at large amplitude.
  - Even for the extraction, the logic could be moved into hardware (FEC CPU no longer involved in interlock decision).

CNGS and TL interlock systems

- Full interlock commissioning in May for CNGS, TI2 and TI8 almost complete.
- Only one issue was found: time jitter on the PC surveillance user permits (up to 2 ms).
  - The time window for PC current surveillance had to be increased from 2.5 ms to 4.5 ms due to signal jitter. This implies that on average the PC checks are performed 2 ms earlier than in 2008.
  - Effect seems to be due to delays in the process execution on the PC FECs. Under investigation.
  - Not a serious issue (FMCMs on really fast circuits).
- SPS extraction kicker Beam Energy Tracking System (BETS) changes:
  - Energy window now reduced to +- 1.5 GeV ~ +-0.3 permill.
  - This window is good for CNGS (dp/p aperture > 0.5 permill), a bit wide for LHC (dp/p apertures ~< 0.3 permill).
  - Once the SPS/LHC energies are frozen, one could reduce to 0.8 GeV.

TL interlock systems – LHCb & ALICE

- LHCb injection permit for beam2 was moved from the Injection BIC to the TI8-downstream BIC (non maskable).

  This means that LHCb can inhibit the beam that is send to the downstream TI8 TED dump.

- The same change should be done for ALICE: from Injection BIC to the TI2-downstream BIC.
  - Before or after the TI2 test in July?
  - If before, ALICE must make sure that the inhibit is not set without reason during the test.

Vacuum interlock story

- It has been decided to remove the BEAM_INFO signals from the valve closure logic. Presented at the LMC on June 10th. In case of a closure request (pressure or user):
  - Vacuum USER_PERMIT set to FALSE.
  - Valve is closed. Closure will re-trigger a USER_PERMIT -> FALSE through the valve switch.
- An ECR will be prepared to document the changes.
- Simulation of the beam impact with valve will be made by R. Appleby. He is starting an implementation of the valves in SIXTRACK to identify loss locations. In collaboration with FLUKA team if required…