



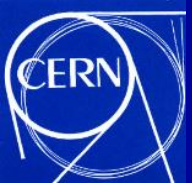
Proposal for a MPP workshop early 2013

D. Wollmann,

on behalf of

R. Schmidt, J. Wenninger, M. Zerlauth,

MPS teams, ...



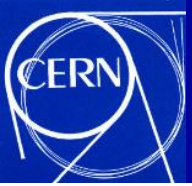
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Mandate and Goals



Discuss **mid-and longer-term improvements** of the **MP** systems:

- review of the current **operational experience** with MP systems during the first running period (2010-2012).
- understanding the **planned changes** of MP equipment during LS1 and the **consequences for operation** after LS1.
- identify areas where **improvements** are required.
- ensuring **coherence** between the different MP systems.
- identify **misses**.



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Topics (preliminary) – 1/6

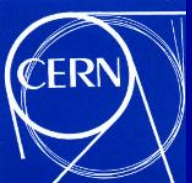


- **General**

- Attitude to system problems: Was reaction on problems adequate?
- MDs: Did current approach work? Improvements?

- **MPS experience from run 2008 - 2012**

- Possible improvement of machine availability (QPS in corrector magnets, ...).
- Experienced limitations concerning protection due to MPS (incl. nearly misses, unexpected dumps, all understood?).
- Review all PC (PIC) beam dumps: were all dumps justified?



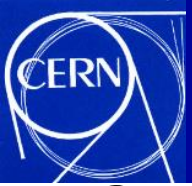
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Topics (preliminary) – 2/6



- **MPS after LS1**

- Inventory of all MP system changes during LS1.
- Needed MPS changes, which are currently not scheduled for LS1.
- BPM orbit interlock (IR6): Energy dependence? Improve post mortem inputs.
- Interlocking of dI/dt (stored beam).
- ADT, Orbit FB (incl. BPMs in TCTPs?), Q-FB, BSRT
- Re-commissioning of MPS after LS1. Further automation?
- Expected differences for post-LS1 operation.
- MPS limitations expected with 25ns?
- How to ensure redundant powering of systems?
- Further interlocking at injection?

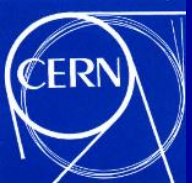


- **Operational Parameters after LS1**

- BLM thresholds for 6.5 TeV.
- Safe Beam Flag (SBF) @ 6.5 TeV: Pro and contra of further relaxation. Would a sufficient setup of Collimators still be possible?
- Interlocks from vacuum: Can thresholds be relaxed?
- Improvements in collimator setting hierarchy possible (ease MDs etc.)?
- Evolution of operational parameters in view of post LS2 operation?

- **Interlocking strategy**

- Software interlocks versus Hardware interlocks: Changes needed?
- Safe Machine Parameters (SMP): Should \square^* be added?
- General strategy for orbit interlocking (based on SIS + op experience).
- Interlocking of all PCs (Kajetan Interlock).
- SIS: dumps due to lost communication.

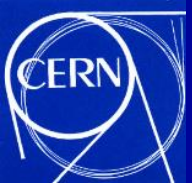


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Topics (preliminary) – 4/6



- **Beam diagnostic**
 - Planned changes in BLM installations during LS.
 - Overcoming current BLM HV limitations.
 - Diagnostics with diamonds?
 - Cryogenic BLMs.
- **Injection / LBDS**
 - New TCDQs, TDIs, TCSGP-IR6.
 - LBDS trigger, re-trigger.
 - What happens if LBDS does not work?
 - Monitoring of abort gap population: Should it be reliable? How?
 - Can we improve protection @ injection?
 - Heating of injection kickers.



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Topics (preliminary) – 5/6

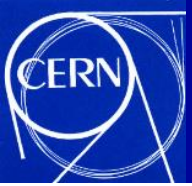


- **Collimation**

- Interlocking of (new) moveable devices (e.g. TCTPs, crystal collimators, XRPs, AFP experiment, ...)?
- Collimators with in-jaw BPM buttons: How to use?

- **Electrical circuit related protection**

- Opening energy extraction for main circuit switches by PC?
- Changes in QPS thresholds?
- QPS in corrector magnets necessary?
- Planned changes for FMCM.
- Experiments: Interlocking if CMS solenoid and LHCb trip?
- Changes in powering interlocks?
- Late dumps due to PC trips (e.g. inner triplets), how to ensure timely dumping by PC interlock?



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Topics (preliminary) – 6/6



- **Changes in injectors affecting LHC**
 - Additional future USERS for SPS (e.g. plasma acceleration beam line) and how to interlock them?
 - SPS interlocking -> 2 new BIS loops around SPS feeding into SPS extraction?
- **Vacuum**
 - Fast valves and protection.
- **Software GUIs**
 - Post Mortem (EIC experience)
 - Aperture meter.
 - Online modeling.
 - Automatic re-commissioning.