Machine Protection Panel during LS1 + Action List

MPP meeting

February 2013

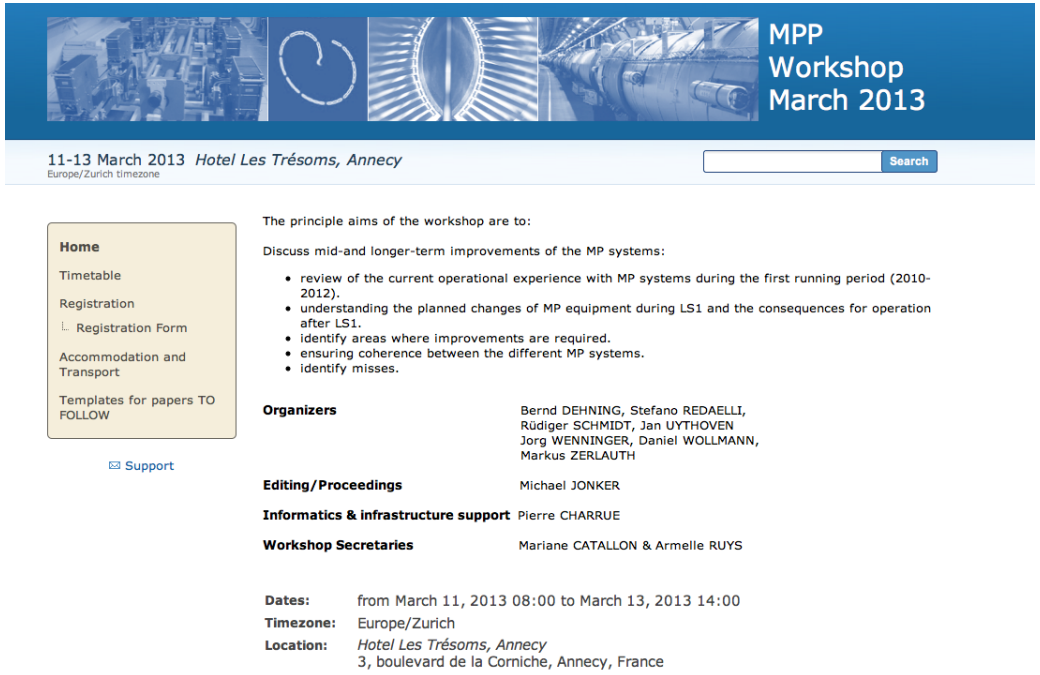
1v0

The first 3 years are over…

Despite (or because of LS1) MPP Workshop to…

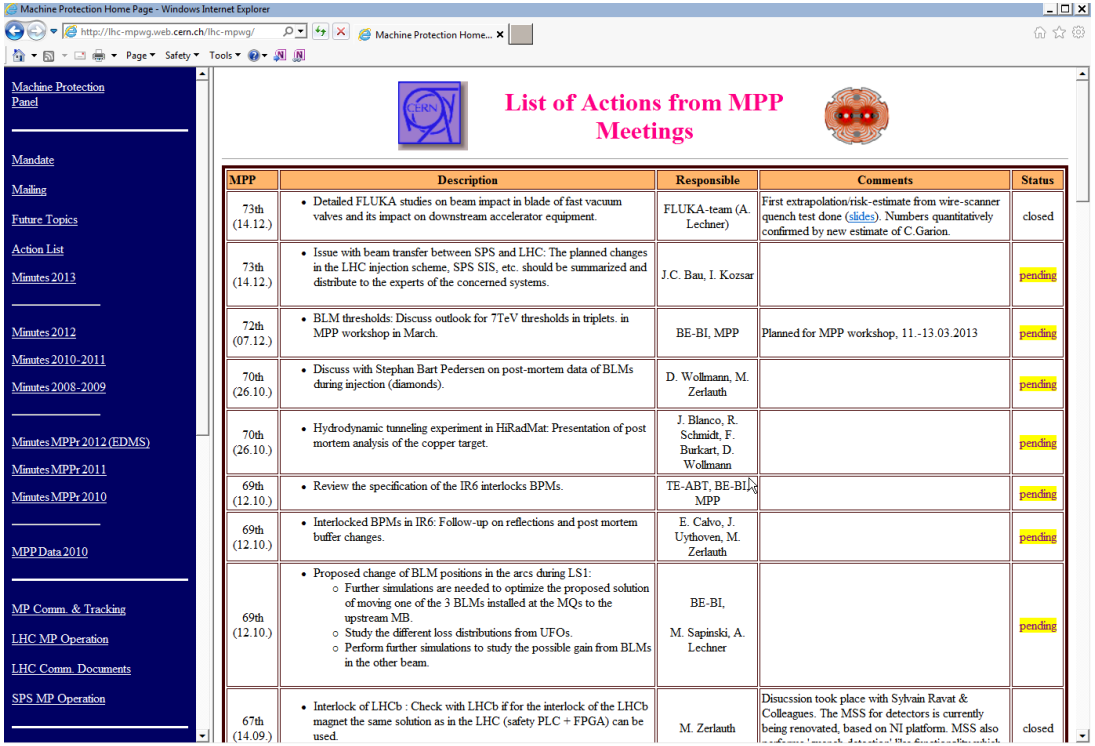
Discuss **mid-and longer-term improvements** of the **MP for the LHC** + injector complex:

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



MPP meetings ctd…

- Continue digesting discussions/outcome of MPP Workshop and open actions in regular MPP meetings during LS1
  - Reduced frequency, probably every 3-4 weeks
  - Possible change of time-slot (due to weekly shutdown-meetings LHC/IEFC planned for Friday morning)
  - Action list ~ 30 follow-ups defined since April 2012, ~ 15 fully closed



Machine Protection Home Page - Windows Internet Explorer

http://lhc-mpwg.web.cern.ch/lhc-mpwg/

Machine Protection Home...

Page Safety Tools

Machine Protection Panel

Mandate
Mailing
Future Topics
Action List
Minutes 2013
Minutes 2012
Minutes 2010-2011
Minutes 2008-2009
Minutes MPPr 2012 (EDMS)
Minutes MPPr 2011
Minutes MPPr 2010
MPP Data 2010
MP Comm. & Tracking
LHC MP Operation
LHC Comm. Documents
SPS MP Operation

List of Actions from MPP Meetings

MPP	Description	Responsible	Comments	Status
73th (14.12.)	• Detailed FLUKA studies on beam impact in blade of fast vacuum valves and its impact on downstream accelerator equipment.	FLUKA-team (A. Lechner)	First extrapolation/risk-estimate from wire-scanner quench test done (slides). Numbers quantitatively confirmed by new estimate of C.Garion.	closed
73th (14.12.)	• Issue with beam transfer between SPS and LHC: The planned changes in the LHC injection scheme, SPS SIS, etc. should be summarized and distribute to the experts of the concerned systems.	J.C. Bau, I. Kozsar		pending
72th (07.12.)	• BLM thresholds: Discuss outlook for 7TeV thresholds in triplets. in MPP workshop in March.	BE-BI, MPP	Planned for MPP workshop, 11.-13.03.2013	pending
70th (26.10.)	• Discuss with Stephan Bart Pedersen on post-mortem data of BLMs during injection (diamonds).	D. Wollmann, M. Zerlauth		pending
70th (26.10.)	• Hydrodynamic tunneling experiment in HiRadMat: Presentation of post mortem analysis of the copper target.	J. Blanco, R. Schmidt, F. Burkart, D. Wollmann		pending
69th (12.10.)	• Review the specification of the IR6 interlocks BPMs.	TE-ABT, BE-BI, MPP		pending
69th (12.10.)	• Interlocked BPMs in IR6: Follow-up on reflections and post mortem buffer changes.	E. Calvo, J. Uythoven, M. Zerlauth		pending
69th (12.10.)	• Proposed change of BLM positions in the arcs during LS1: ○ Further simulations are needed to optimize the proposed solution of moving one of the 3 BLMs installed at the MQs to the upstream MB. ○ Study the different loss distributions from UFOs. ○ Perform further simulations to study the possible gain from BLMs in the other beam.	BE-BI, M. Sapinski, A. Lechner		pending
67th (14.09.)	• Interlock of LHCb : Check with LHCb if for the interlock of the LHCb magnet the same solution as in the LHC (safety PLC + FPGA) can be used.	M. Zerlauth	Disucssion took place with Sylvain Ravat & Colleagues. The MSS for detectors is currently being renovated, based on NI platform. MSS also	closed

MPP meetings ctd…

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MPP meetings ctd…

66th (31.08.)	• Linac4 failure catalogue: Meet with the different experts to get the missing information.	A. Apollonio		pending
66th (31.08.)	• Linac4 BIS: Finalize BIS specification.	B. Mikulec, B. Puccio		pending
66th (31.08.)	• Linac4 BIS: Discussion strategy for mask-able and un-mask-able inputs to the BIC.	B. Mikulec, B. Puccio, R. Schmidt, M. Zerlauth		pending

65th (17.08.)	• CMS solenoid: Add fast power abort of CMS solenoid to CMS beam permit, to avoid its recently observed influences on the beam (beams were dumped due to high losses in IR7). Discuss with N. Bacchetta in September.P
	  ○ Discuss with N. Bacchetta in September.
	  ○ Present possible solutions to MPP.
	• Idem for recent rip of LHCb power supply trip. Sylvain Ravat to investigate possibilities to decrease the filter time + relay activation time of the MSS (10+15ms)
		N. Bacchetta, S. Ravat,D. Wollmann, M. Zerlauth	CMS features an MSS (Magnet Safety System) + CIBU, the latter is however currently not connected. A HW Signal (indicating a Fast Discharge or Slow Discharge event in the solenoid) exists already. Everyone agreed hwoever that only a Fast Dicharge should be considered to eventually dump the beams. All 4 LHC experiements used the same MSS, due to obselete components (Fuse Programmable ALTERA FPGA), a new design is already undergoing for LS1 (based on National Instruments Rio card). Upon this occasion a HW Signal for Fast Discharges will be provided, if and when this Signal will then be connected to the CIBU can be decided as a Funktion of other mitigation measures available after LS1 (slow OFB during SB, SIS on slow changes,). -) The LHCb trip was correctly reported by the MSS but has an unusual delay of 25 ms after the initial failure of the power converter (no big orbit changes nor losses observed yet). This was traced back to input filters and additional safety relays at the output of the MSS. Due to the ongoing re-design of the MSS (see above), the involved colleagues will study the possibility of using opto-couplers instead of slow relays + reduce the filtering needs (by replacing voltage signals with current loops for less EMC sensitivity). It is expected to bring down the additional delay to ~5-10 ms.	pending

MPP meetings ctd…

65th (17.08.)	• LS1 work on the upgrade of the UPS power distribution of the LBDS:
	  ○ TE-MPE shall provide the redundant link from the BIS to the re-triggering lines of the LBDS (allowing to trigger a delayed asynchronous dump in case the LBDS doesn't cause a synchronous one within 250µs).
	  ○ The LBDS UPS powering upgrade should be re-addressed in MPP next year to report on the status of the mitigations.
		TE-MPE
		
		MPP
			Work ongoing for both items	pending

64th (13.07.)	• PSpice simulation of the converter trip in RTQX2.L2:
	  ○ Correlate the current change and the orbit change, with the help of the post mortem data. (MZ, ER)
	  ○ Discuss possibilities to improve the circuit current supervision in the triplet, to ease the understanding of these types of events.
	  ○ Discussed presented results with Hugues and Valerie.
	  ○ Decrease the validation time of an I_ERR deviation (currently 2 seconds). To be done during LS1.
		M. Zerlauth,
		E. Ravaioli,
		V. Akpata-Buchon
			Simulated current changes seems consistent with orbit recordings in PM.
			
			Possibilities for adding additional LEMs in the free-wheeling paths of the triplet circuit have been discussed with EPC. An Ethernet based data acquisition system (like for the SVC) might be adapted for this purpose. To be followed by EPC.
				pending

Fin

Thanks a lot for your attention + see you soon in Annecy!