

Review of MPS readiness for unsafe beam / trains

J. Uythoven, J. Wenninger, D. Wollmann, M. Zerlauth

MPS re-commissioning status:

- MPS re-commissioning 2017

Injection / LBDS (from Wolfgang)

- Validation of Interlock BPMs: before 3b stable beams; ABT and BI, ~4h
- BLM inhibit: No need before unsafe beams; Christos and ABT, few hours pilot, few train injections (probably possible parasitically)
- TCLIB.P8 hierarchy check: Before 12b; X-measurement; ABT; Requires loss maps afterwards (check timing with Daniele M.)
- 12b injection: Check if 1st bunch location on waveform is correct; ABT
- BETS TDI check: No beam; Before 12b; ABT; Ideally if TDI BETS tables in HW updated, but not absolutely necessary
- BETS TCDQ: Ramp with pilot; Before 3b in stable beams; Loss maps required
- AG cleaning: Before trains are ramped; AG monitoring required;
- Inj gap cleaning: No MP relevance
- Verify Direct BLM triggering

BI/BLM

- Interlock Inhibit at injection has not been tested yet - not blocking

Collimation

Stefano: A short summary from collimation. Still some activities to do:

- TCLIB issue with hierarchy — solved.
- Roman pot alignment and preparation of settings/sequences.
- Energy and betastar limits were deployed. We are checking off line the various cycles done so far.
- SIS Interlock: to be discussed with Joerg. From collimation side, we completed the planned beam tests at injection and top energy.
- We are also evaluating a proposal from Marek, which seems very pertinent, to add sequencer checks on the clomp status.
- Loss maps table is proceeding, but is to be completed.
- We have some strange pattern in IR7 during the preliminary off momentum loss maps done yesterday. If possible, we want to check the alignment of a few collimators at flat top.
- Alignment issues with TCL.4L5.B2: we see a tilt angle that we need to investigate further. Inspection in the tunnel done yesterday did not reveal any issue, but a detailed survey was not possible. Can operate like that until TS1, so this is not blocking at this stage.
- In addition to the loss maps, we request, like in 2016 a dump with tighter TCT settings.
- Collimators with wires: still missing machine protection tests on fifth axes.

- Loss maps performed and verified
- Verification of DOROS BPMs during upcoming stable beams

Loss map status

Loss Maps	450 GeV		Ramp & Squeeze	6.5 TeV				
	Inj. Prot. IN	Inj. Prot. OUT		Flat Top	Squeeze	End of Squeeze	Physics (XRP-OUT)	Physics (XRP-IN)
B1H	✓	✓	✗	✗	✗	✗	✗	✗
B1V	✓	✓	✗	✗	✗	✗	✗	✗
B2H	✓	✓	✗	✗	✗	✗	✗	✗
B2V	✓	✓	✗	✗	✗	✗	✗	✗
+ $\delta p/p$	✓	✓	—	✗	—	✗	—	✗
- $\delta p/p$	✓	✓	—	✗	—	✗	—	✗
ASD	✓	—	—	✗	—	✗	—	✗

✓ = done, to be verified

✓ = done and OK
 — = not requested
 ✗ = to be done

SIS / OP / Feedbacks

- SIS orbit interlocks to be re-calibrated/verified
 - Orbit feedback issue + feed forward
-
- PC interlock – tighten thresholds and unmask before intensity ramp-up

BIS / PIC / WIC / FMCM / SMP

- Finalize FMCM tests (top energy)
- Verify SMP flags, when ready for trains (unsafe beam)
- PIC: 60 A powering permit – not blocking, but to be understood in the coming weeks → implementation of SIS interlock.
-



www.cern.ch

Re-commissioning plans of MP systems presented to MPP

MP System	Responsible	MPP presentation	Commissioning procedure
Collimation System	B. Salvachua (Stefano Redaelli / Roderik Bruce)	07.04.	To be updated
Injection Protection System	C. Bracco / W. Bartmann	31.03.	Released
Beam Interlock System	C. Martin / I. Romera	17.03.	Released
Powering Interlock System	A. Antoine / I. Romera	17.03.	Released
Vacuum System	G. Pigny	17.02.	Released
Beam Dump System	C. Bracco / W. Bartmann	31.03.	Released
FMCM	A. Antoine / I. Romera	17.03.	Released
BLM System	C. Zamantzas / B. Holzer	07.04.	Final review
Warm Magnet Interlock System	R. Mompo / P. Dahlen	17.03.	Released
Safe Machine Parameter System	I. Romera / C. Martin	17.03.	Released
Software Interlock System	J. Wenninger / L. Ponce	31.03.	Released
Beam Current Change Monitor	D. Behlorad	07.04.	Draft procedure

Based on the presentations and the procedures a list of **MPS tests with beam** was derived: MPS re-commissioning 2017 → **daily updated**