Meeting of the restricted Machine Protection Panel

Approval of MDs 9546 and 9325

October 16th, 2024.

Participants:
Sara Morales (SY-BI), Pascal Hermes (BE-ABP), Carlo Emiolio Montenari (BE-ABP), Stefano Redaelli (BE-ABP), Jan Uythoven (TE-MPE), Cedric Hernalsteens (TE-MPE), Milica Rakic (BE-ABP), Yann Dutheil (SY-ABT), Andy Butterworth (SY-RF), Giovanni Iadarola (BE-ABP).

The slides of all presentations can be found on the website of the Machine Protection Panel and on Indico.

MD9546 - B1 collimation quench test with protons (C. E. Montanari, P. Hermes)

Filling scheme
The filling scheme will be composed of
- 12b train for orbit steering
- 3x1 INDIV to test the ADT settings
- 3x36b trains to test the ADT gains and settings
- 2x180b to perform the quench attempts.

In total three fills are scheduled, allowing then for a total of 6 quench attempts. Jan commented that this implies a tight schedule and reminded everyone that two hours must be reserved for the BLM team to change the thresholds.

Collimation settings
The first fill will use the nominal collimation settings (see Figure below) while the fills 2 and 3 will use the relaxed settings where the TCS at moved from 6.5 sigma to 8.5 sigma.

| Family	Region	Nominal $[\sigma]$	Relaxed $[\sigma]$
TCP	IR7	5	5
TCSG/TCSPM	**IR7**	**6.5**	**8.5**
TCLA	IR7	10	10
TCP	IR3	15	15
TCSG	IR3	18	18
TCLA	IR3	20	20
TCDQ	IR6	7.3	7.3
TCSP	IR6	7.3	7.3
TCT	IR2	37	37
TCT	IR1/IR5/IR8	18	18

ADT settings

For each quench attempt the goal is to reach 1 MW losses slowly (within 20 s) and then to maintain this loss level for about 10 s (see figure).

Carlo Emilio stressed that an rf expert must be physically present to operate the ADT expert script. Daniel Valuch will be available for remote support. In addition, the gain window for the batch excitation might require the modification of machine critical settings.

Jan asked who will be present. Stefano mentioned that he will contact Heiko and Wolfgang to determine who can be present during the MD. Andy agreed.

The monitoring of the power loss will be done in real time with a dedicated OP software.
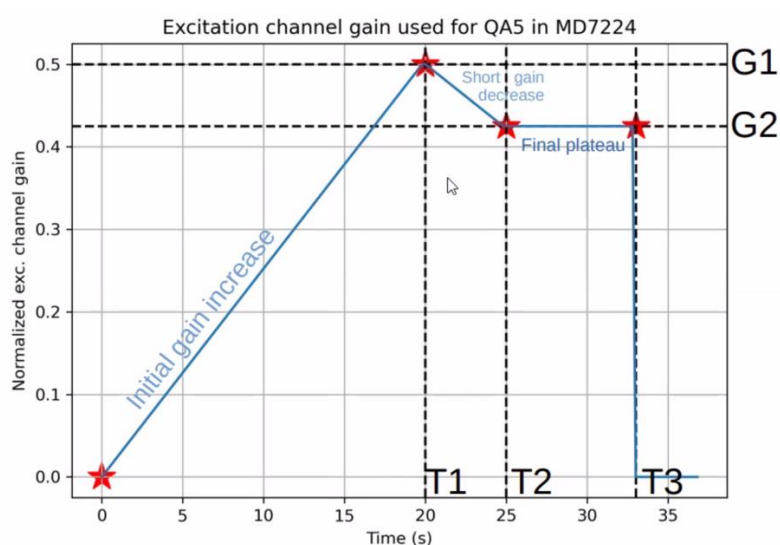
Jan asked which magnet will be aimed at for the quench. MB.A9R7 is the primary target, with MB.B9R7 which will receive similar loss levels. Jan commented that MP3 validated that there is no issue with that magnet or with neighbouring magnets.

BLM thresholds

The BLM thresholds were presented at the BLMTWG with the details to be finalized by Friday at the MPP. The thresholds have been built from loss maps with relaxed collimator settings. After a review of the IR6 losses, it was decided to choose the vertical plane so that the losses in IR6 are minimized.

To avoid cross-talks with Beam 2, it is necessary to mask the following BLMs:
- BLMTI.06L7.B2I10_TCLA.A6L7.B2
- BLMTI.06L7.B2W10_TCLA.B6L7.B2.

These BLMs risk to reach saturation due to the B1 losses.

Jan reminded that the loss maps date back from May 2024. Jan suggested to repeat these loss maps with relaxed settings in the afternoon. Stefano agreed and mentioned that it can be

combined with other collimation activities in the afternoon. The result should be discussed at the MPP on Friday.

Jan D. asked about an ASD with the relaxed settings. Pascal mentioned that IR6 is not modified and that previously ASD were not performed. Stefano asked if an ASD with pilot bunches would make sense. Jan U. summarized that the ASD is not required for the validation but might be attempted with pilot bunches. The betatron loss maps for the relaxed settings must be repeated. If sufficient bunches are available, also the loss maps with nominal settings can be repeated later today.

Collimator temperature thresholds

The thresholds will not be modified, not before and also not during the MD. Active monitoring will be performed online.

QPS settings

It is important to ensure the full performance of the QPS logging system in case of quench. A full reset of the communication boards should be performed before the MD. Have piquet team available.

Actions
- Organise for an ADT RF expert to be present during the MD
- Perform the betatron loss maps with relaxed collimator settings
- Finalize the BLM thresholds.
- Have a confirmation from the QPS team that boards will be reset before the MD.

The actions will be followed-up during the next MPP meeting on Friday.

MD9325 – Beam halo population measurements using collimator scan at the end of squeeze (M. Rakic)

Milica summarized the results from the previous similar MD and the goals for the upcoming halo MD.

The total number of bunches in the 8b4e trains is 112b.

Action: Edit the procedure to include the exact filling scheme name and details.