210th Machine Protection Panel Meeting (LHC)

Friday 2 July 2021 (Zoom)
Indico MPP Website

Participants

F. Alessio (EP-LBC), A. Calia (BE-OP), M. Deile (EP-CMT), M. Di Castro (BE-CEM), Y. Dutheil (SY-ABT), C. Hernalsteens (TE-MPE), D. Jacquet (BE-OP), D. Lazic (EP-UCM), E. Matheson (BE-CEM), D. Mirarchi (BE-OP), F. Moortgat (EP-CMG), B. Salvachua Ferrando (SY-BI), M. Solfaroli Camillocci (BE-OP), H. Timko (SY-RF), G. Trad (BE-OP), J. Uythoven (TE-MPE), A. Verweij (TE-MPE), J. Wenninger (BE-OP), C. Wiesner (TE-MPE), D. Wollmann (TE-MPE).

Beam test tentative planning (J. Wenninger)

J. Wenninger presented the tentative planning for the 2 week beam test in October 2021. The test objectives and priorities are:

- Circulate the two beams at injection energy
- Setup the machine at injection energy
- Verify machine aperture
- Pre-commissioning of key systems
- Collision for experiments

Beam conditions will be below the Setup Beam Flag (SBF) limit, with maximum intensities of 3 bunches of 1e11 p/b, also minimising the time needed for machine protection validation in order to fit the tight schedule. A ramp to top energy will not be possible.

Discussion

J. Wenninger mentioned that it is not foreseen to have any crossing angle or separation at the IPs during collisions.
J. Uythoven asked when the beam test will finish if it will start Monday 18th October. J. Wenninger and D. Wollmann clarified that it will end after 2 weeks on Monday 1st November. Most probably the tests can go on until 6:00-8:00 on 1st November.
J. Wenninger mentioned that it could be possible to advance some checkout activities during the weekend before the beam test if the experiments manage to close the caverns and the powering tests are finished. M. Solfaroli comments that before the beam test there are 10 days of powering tests that will start on the weekend (9th October). This poses some problems with expert availability which will be limited during the weekend.
M. Solfaroli commented that the cryo team made a strong request to reduce the beam test by 2 days, effectively removing the last weekend. J. Wenninger agreed that a clear statement has to be made to coordination to keep the beam test 2 weeks long given the already tight schedule.

Machine protection requirements for the pilot beam test (M. Solfaroli, J. Uythoven, J. Wenninger, C. Wiesner, D. Wollmann)

D. Wollmann presented a proposal for the machine protection requirements for the pilot beam test. The goal of the presentation is to validate the proposal with system experts.
A full validation will be needed for: Beam Interlock System (BIS), Powering Interlock System (PIC), Vacuum system, Warm Magnet Interlock System (WIC), Safe Machine Parameter System (SMP) and the beam presence flag.
Due to the limited scope of the beam test, a partial validation will be needed for: Injection protection, Beam Dump System (LBDS), Fast Magnet Current Change Monitor (FMCM), Beam Loss Monitors (BLM), Software Interlock System (SIS) and Collimation system.
Roman Pots interlock and movement have to be validated. ADT excitation needs to be fully commissioned. Finally, Beam Current Change Monitor (BCCM) non-interlocking tests will be performed parasitically.

Discussion

B. Salvachua commented that there could potentially be a delay with the test with radioactive source that could affect the planning. The current plan for the BLM tests with the radioactive source ends one week before the beam test. The plan will be updated accordingly when tests will actually start. In case of delays with the BLM tests, B. Salvachua proposed to identify the most critical BLM regions to validate before the beam test, e.g. where BLMs have been changed or recabled, and continue with the rest of the machine afterwards to avoid further delays.
J. Uythoven pointed out that the BLM signal is really important for beam studies. Therefore, critical BLM regions to test in case of delays have to be carefully chosen also considering this constraint on top of machine protection. B. Salvachua commented that injection and dump regions are very important to test but very few modifications were done there during LS2.
D. Wollmann proposed to first gather experience with BLM radioactive source tests and then a list of priorities will be made if needed.
Y. Dutheil commented that for the TDIS they do not plan to make beam based alignment, rather keep them quite open for the beam test. J. Wenninger mentioned that for the beam test there is no need for a full alignment for all collimators, but it would be very beneficial to do an alignment in order to test the software. J. Uythoven pointed out that it would be good to test the alignment on the TDIS as well since it is a new system. Y. Dutheil mentioned that the beam based alignment is in the list of machine protection tests but it has been lowered in priority due to the reduced scope of the beam test. D. Wollmann summarized the discussion by concluding to remove the beam based alignment of the TDIS from the list of requirements for the beam test. The TDIS will be tested during the full beam based alignment of the other LHC collimators (which is a bonus activity in the current planning).
Y. Dutheil asked about the TCSP beam based alignment activity. D. Mirarchi confirms that the TCSP will be part of the beam based alignment along with the other selected LHC collimators.

Follow-up of MPS re-commissioning via checklist tool (D. Wollmann)

D. Wollmann gave a quick demonstration of the new checklist tool (https://checklist.cern.ch/ from within CERN). C. Hernalsteens will give a more in-depth presentation in a later MPP.

Discussion

D. Mirarchi and B. Salvachua asked if the checklist tool could also be used for the checkout tests of the collimation and BLM systems. D. Wollmann answered that it will and the tests present in the procedures will be imported by MPP.
H. Timko asked why there are no entries in the RF category in the checklist tool. D. Wollmann commented that MPP will enter the RF checkout tests related to machine protection. J. Wenninger and H. Timko agreed to define later the relevant tests to be added in the RF category.

Actions

- Define and create checklist tests for collimation, BLMs and the RF system (J. Wenninger, H. Timko, C. Hernalsteens)