212th Machine Protection Panel Meeting (LHC)

Friday 27 August 2021 (Zoom)
Indico MPP Website

Participants

A. Apollonio (TE-MPE), C. Bracco (SY-ABT), R. Bruce (BE-ABP), A. Calia (BE-OP), E. Calvo Giraldo (SY-BI), Y. Dutheil (SY-ABT), C. Hernalsteens (TE-MPE), H. Hillemanns (EP-AID), M. Hostettler (BE-OP), D. Lazic (EP-UCM), A. Lechner (SY-STI), E. Matheson (BE-CEM), D. Nisbet (SY-EPC), B. Petersen (EP-ADT), M. Saccani (SY-BI), B. Salvachua Ferrando (SY-BI), R. Secondo (TE-MPE), M. Solfaroli Camillocci (BE-OP), J. Stelzer (EP-UAT), G. Trad (BE-OP), J. Uythoven (TE-MPE), J. Wenninger (BE-OP), C. Wiesner (TE-MPE), C. Zamantzas (SY-BI).

Minutes approval MPP 211th

M. Solfaroli asked for comments on the minutes of the 211th MPP. No objections were made and the minutes were approved.
M. Solfaroli asked if there were news about the action LHCb velo wake field suppressor. J. Uythoven answered that a plan has been formalized (and presented to LMC) and the activity will start soon.

Status of BLM testing with TIM and proposal for sub-set of tested BLMs before the pilot beam test (B. Salvachua and C. Zamantzas)

B. Salvachua presented an update on the status of the BLM radiation test. An alternative technique for radiation source test was presented, the battery test. It involves the usage of a battery that will be briefly connected to the BLM, then the signal is checked offline. This technique has the drawback of possibly damaging the BLM connectors.
B. Salvachua presented the plan to test the BLM system before the LHC beam test with a list of priorities taking into account the TIM efficiency during the previous weeks (with a realistic average of 20 BLM/day).
In order to carry out the plan, B. Salvachua mentioned that in the coming weeks another TIM wagon will be added and the BLM team will start testing with the battery technique. B. Salvachua also mentioned that battery tests are still mandatory for testing all the BLMs in the LHC before the start of Run2 (currently scheduled for mid-February).

Discussion

R. Bruce asked if the BLMs near the triplets will be tested as well because they are used for the aperture measurement. B. Salvachua answered that the triplets are not included in the

current priority plan. B. Salvachua explained further that those BLMs are not easily accessible by personnel when the triplets are cold due to safety. B. Salvachua also mentioned that BLMs in the triplets areas were not subject to interventions during LS2.
M. Solfaroli asked how many BLM were tested so far. B. Salvachua commented that the list of tested BLMs is compiled regularly.
M. Solfaroli commented that adding a second TIM wagon can theoretically improve the number of tested BLM/day but this has to be scheduled with other activities due to the fact that entire sectors have to be closed for the TIM to operate. M. Solfaroli also suggested to include in the TIM planning some nights or weekends to accommodate all the other activities.
M. Solfaroli asked if the BLMs near the areas where the magnets were exchanged during LS2 are in the priority list. B. Salvachua confirmed that those BLMs are indeed in the priority list.
C. Zamantzas commented that in the next weeks the BLM team will organize the Battery tests campaign in a flexible way such that it is compatible with access constraints.
J. Uythoven asked how long it took to test BLMs in the past with personnel. C. Zamantzas answered that on average it was 2 weeks per sector with 4 people. Two TIM wagons theoretically testing 40 BLM/day should already be more efficient.
J. Uythoven asked if it makes sense to test the triplet area manually since the access is so difficult. C. Zamantzas answered that if only the external part of the triplet area is tested (thus reducing the safety risk for personnel) it should be enough. In any case, personnel safety has to be discussed.

BLMs: Firm- and software changes during LS2 (M. Saccani)

M. Saccani started with an overview of the BLM LHC system. The next part of the presentation focused on the changes to the BLM system performed during LS2.
Detector changes in the tunnel were already presented to the 207th MPP by B. Salvachua. A complete list with all the details can be found in EDMS 2510506 document.
During LS2, multiple acquisition cards have been replaced or repaired. InforEAM is in place to track all the future changes.
WorldFIP has been added to the acquisition board for better remote control over the cards with the aim to reduce intervention time in case of problems.
The surface electronics has been updated as well with new firmware for the CISV (Beam Energy Rx, following the updates of TE-MPE-MI), the BOBR (Timing Rx, for better XPOC and PM analyses), BLETC (Threshold Comparator, for better maintainability) and BLECS (Combiner&Survey, for fixing some issues and adding new features). BLECS firmware update is still ongoing.
No changes during LS2 were made to the interface to the BIS (CIBU).
Work on the Injection Interlock Inhibit is still ongoing and will be deployed in the generic firmware of all the BLECS boards, but enabled only at specific locations.
The BLM software has been adapted to be LS2 baseline compliant. Operational GUIs and expert applications have been re-delivered and consolidated.
BLM concentrators were rebuilt with UCAP and will run in parallel with the legacy system for validation before being used in production. Work and validation of IQC, UFO Buster and Sequencer is still ongoing.

Historical data has been successfully ported to NXCALS. Sanity checks of the BLM system have been taken over by the SY-BI-SW section. The code has been improved for maintainability and the work for automatic daily checks is still ongoing.
In conclusion, the hardware changes are completed and validation of all the systems is ongoing as planned. In order to perform noise analysis and connectivity checks, some “quiet nights” (see discussion) will be required.

Discussion

M. Solfaroli asked about the collimator data that is mentioned in the slides. M. Saccani answered that BLM hardware has a special channel that sends data at 100hz and is used for the alignment of the collimators.
R. Secondo commented that there was no change to the CISV firmware during LS2. There was an issue with a BLM rack that, after further investigation, was due to a faulty timing cable which has been replaced in the meantime.
J. Wenninger asked about the “quiet” nights that were mentioned in the presentation. M. Saccani explained that the noise analysis of the signals can be impacted by other LHC systems. J. Wenninger commented that October will be a busy period due to many activities scheduled, so it would be best to do it in September.
J. Uythoven asked how many issues were found during the firmware verification. M. Saccani answered that indeed 17 major and lots of minor issues were found in the verification step.