

## Summary Notes: 10<sup>th</sup> Meeting of Sub Working Group on the Commissioning of the Machine Protection System, Wednesday 10<sup>th</sup> October 2007

**Present:** Reyes Alemany, Ralph Assmann, Fernandez, Verena Kain, Alick Macpherson, Bruno Puccio, Stefano Redaelli, Rudiger Schmidt, Jan Uythoven, Markus Zerlauth,

**CC:** Roger Bailey , Eva Barbara Holzer, Goddard, Magali Gruwe, Mike Lamont, Laurette Ponce , Walter Venturini

### MPSC Collimation Procedure – Ralph Assmann

- Ralph [presented](#) a summary of the status of the MPS Commissioning procedures.
- The procedure concerns a variety of equipment associated with the collimator project.
  - **Question from Ralph:** For controls commissioning procedure, who is responsible for:
    - The Roman Pots, TCDQ ( who might use the collimator control system)
    - Other collimator like objects. Eg TDI, TCDD, (who use the collimator control system)If these objects are to be incorporated in the Collimator Commissioning, Ralph would need additional manpower.
  - **MPSC Response:** It was agreed that as these systems use/may use the collimator control system, they should (at least temporarily) be reviewed by the Collimator controls group and the equipment teams concerned..
  - **Action:** It was then agreed that Thomas Weiler should include these systems in the draft of the test procedures.
- As part of the MTF procedure for the collimator system, there are some “sanity checks” to be included in the operational procedure. It was agreed that these sanity checks are not a part of the MPS commissioning but instead pertain to collimator operation.
- MTF procedures for the collimation system exist Hardware Commissioning exist, they are foreseen to be published as EDMS document
- The collimator system generates interlocks to the BIS from:
  - Switch positions, position sensor readings, motor and controls status, and temperature sensors.
- It was stated that the collimation system receives machine info over the timing system (beam energy, squeeze factor, machine mode).

- For interlocks, the collimator settings are in MCS, but once set, the collimator interlock settings should be switched to local. The machine mode can still be used (even if it is not a Safe machine parameter), and should be compared with the local switch settings.
- **MPSC response:** This is OK, but it is required that neither the telegram nor time based functions not be used in interlocking functions.
- **SIS response:** For settings, it is also possible to use energy tracking to crosscheck.
- The collimator system has no dependence on the BEAM\_INFO flag that is returned by the BIS.
- For signal exchange between the collimation control system and the BLM system, several links foreseen for operational set-up, but the collimator control system will not generate an interlock due to BLM measurements. The interlock is handled entirely by the BLM system.
- Logging of losses and collimator settings is to be performed, but it is at present not foreseen to provide safety-critical fast post-mortem data.
- Interface with the MCS
  - Manual Interface: As the basic protection parameters are defined by human input, the collimator MPSC procedure addressed the concerns associated with this.
    - One concern related to setting the dump threshold based on jaw temperature. In order to set the dump thresholds, the energy flow should be understood of the energy that is not contained in the collimator.
    - The reference value of the collimator settings should be clearly determined and be agreed upon
      - **Action:** Collimation WG.
  - Semi Automatic MP input to MCS: Similarly, the check of the semi-automatic input from collimation to MCS has to be checked, but the responsibility for this is not yet defined.
    - **Action:** Define who is responsible for this (Collimation or MP)
  - Automatic MP input to MCS: Here the question was raised as to what state the front end system would be in after a front end reboot.
    - It was noted that a PXI reboot will by default, initiate a beam dump. After the reboot the system will come up in an unsafe state, and will prevent any injection until a drive hardware is performed.
- As part of the system test during the Machine Checkout, to be repeated every year, it is required that the full function driven movement be submitted to a full MPSC testing, and this must include simulated failures, and the associated cross checking with MCS.
  - For moving collimator jaws these tests must confirm the response time
  - All tests must also include the confirmation of the mode change, as initiated via the sequencer.

- MPSC response: These tests have to be performed on every collimator as well as the collimation test stand ( Bat 252)
  - Note that for these tests on the test stand, assistance is needed from Bruno and Ben, as a local BIC and timing simulator are needed.
- For the tests conducted in the tunnel, the order is IR7, IR3, then around the ring
  - It is possible for tests to proceed while people have access to the sector; barriers and signs are required, as well as coordination operations.
- As part of the tests logging is required.
  - In particular logging of temperature during bakeout. It is foreseen to have monitoring via PLCs
- For checkout with beam, it was stated that for 43 bunches of  $4 \times 10^{10} p$  at 450 GeV should be used to set thresholds.
  - Note that at increased intensities, an update of cleaning efficiencies and MCS settings is required.
- For commissioning checks when there is a significant change in optics, concern was expressed, as it was not clear if a change in optics would be reflected in a change in MCS settings
  - Concern: Optics changes can not be allowed if it will effect MPS protection. If optics changes imply such changes, a procedure has to be determined

#### AOB

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- Alick briefly report that the MTF structure for MPSC is now being developed and an update will be given at the next meeting.
- Next MPSC meeting
  - **Date: 12<sup>th</sup> December**
  - **Time: 10:00 - 12:00**
  - **Room: 865-1-D17**