

# Machine Protection Panel

Minutes of the 1st meeting, 3rd September, 2008

**Present:** R.Assmann, B.Dehting, B.Puccio, E.Carlier, B.Goddard, J.Uythoven, J.Wenninger, V.Kain, R.Schmidt, J.Wenninger, M.Koratzinos, J.Strait, R.Appleby, D.Macina, S.Redaeli

## Agenda:

- Preparations for beam operation

There is a web page: <https://lhc-mp-operation.web.cern.ch/lhc-mp-operation/>

**PIC:** some tests of the interface between PIC and BIC for some sectors for injection tests have been done. Before 10<sup>th</sup> September, the interface between PIC and BIC for the other sectors will be tested. Until circulating beam is established, the PIC will use a flexible configuration that allows masking PIC inputs. Some time is required after circulating beam to setup the PIC configuration files such that critical circuits cannot be masked. This requires some re-testing, estimated to take 0.5 days. B.Holzer has given us with a list of circuits that should be unmaskable.

**BIC:** a program that provides an overview of all masked channel would be very useful. The risk is that input channels are masked, and masks accumulate. Alick is working on an application that provides the information. Observation: if an input that is masked changes state, this transition does not appear in the history buffer, but in the logging it is available.

**WIC:** the interface between the WIC and the BIC for most electrical circuits has been tested, only circuits for the WIC in pt.3 needs to be finished.

**VACUUM:** the interface between most valves and the BIC has been tested. Pt.5 needs still to be done on Monday.

**FMCM:** all but one FMCM (for the ALICE compensator magnet) are installed. The last one will come in 2-3 months time (we could install a prototype, if needed before— Robert will have a look if this is required soon). The parameters of the FMCMs are approximate, and a fine adjustment is required. The tests required to determine the exact parameters can be done from the CCC, possibly this weekend. For some FMCMs the parameter adjustment requires tunnel access.

**LHCb VELO position interlock:** in order to test the interlock, the mode has to be set to “stable beam” (two conditions: physics energy and operator declaring stable beams). This is not yet the case, but for a test the SMP specialists could provide this mode.

**LHCf interlock:** has been tested.

**TOTEM position interlock:** not yet available, pots are retracted. Since there is no remote diagnostics of the position, it must be made sure that the devices are out (Daniela will verify).

**Experiment magnets:** to be tested

**BPM in point 6:** to be tested on this weekend

**BLM:** some issues with the software (downloading of the thresholds). For the first days of beam operation, the BLMs are defined as maskable inputs. This should be changed soon, and the threshold management should go under the management of critical settings. The thresholds must be finalized.

**SIS:** runs smoothly. Included are the interlocks for the experiments, and a more complex interlock that prevents building bumps combining the current of several magnets. The SIS allows setting to a maximum energy and intensity, this should be used to prevent risky operational steps before the MP systems are validated. The energy and intensity values should be set to reasonable numbers (to be defined).

**BTV:** the interface between BTVs and BIS has been tested.

**LBDS:** the system for keeping the gap free of particles needs still commissioning. For the TCDQ, the interlock on position function needs to be checked. The beam position interlock on the TCDQ (in SIS) needs to be discussed.

**Access system:** when the access is violated, the beam is dumped via the BIS and directly via a cable to the LBDS. This functionality needs to be validated.

**Entire interlock chain from users to LBDS:** should be validated for a subset of interlocks in each system.

**SBF:** is currently set to  $10^{12}$  protons. Ralph pointed out that this might be too high for beam on the tungsten collimator, in particular for low emittance beams. The Probe Beam Flag is set to  $10^{10}$  protons.

**450 GeV collisions:** issues for protection, in particular to prevent the risk of the injection kicker to deflect the beam into an experiment. To be further discussed if colliding beams at 450 GeV is suggested.

**General:** the machine protection systems are in a state that they will flexibly handle the beam tests on 10<sup>th</sup> September and the following days (in particular establishing circulating beams). However, they are not validated for operation with high intensity beam, and some additional preparation and commissioning will be required. A list will be established (examples: BIS enable most inputs, introduce systems in management of critical setting, set PIC configuration for circulating beam operation, perform validation experiments, ....)