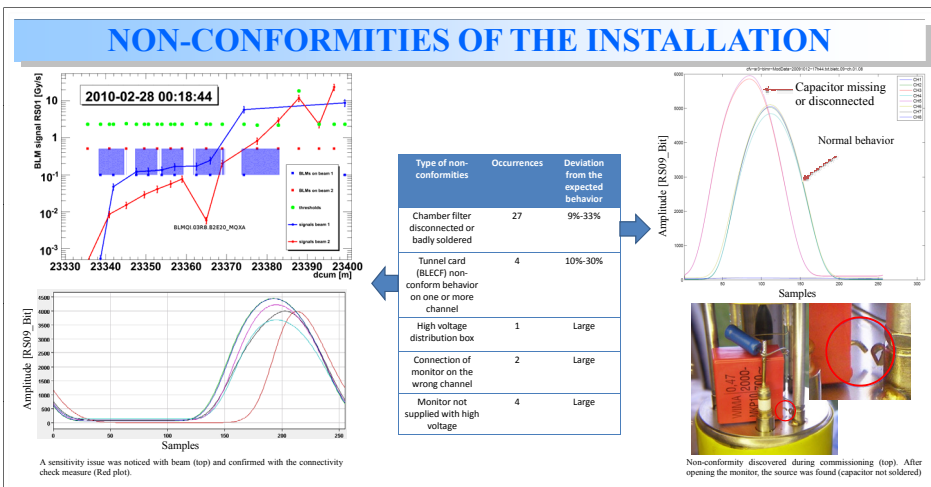
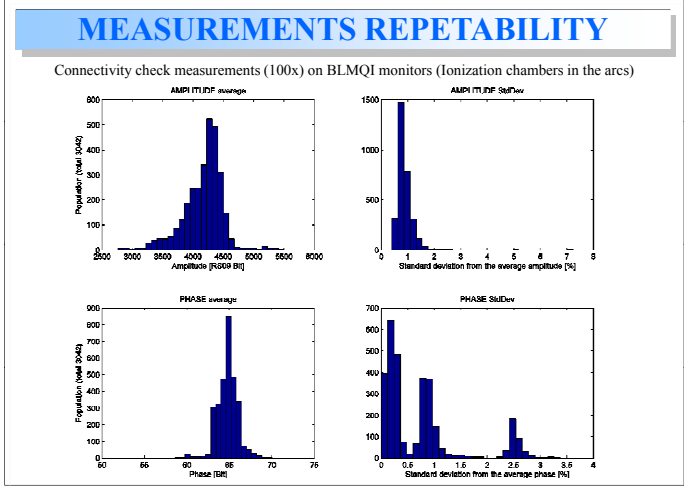
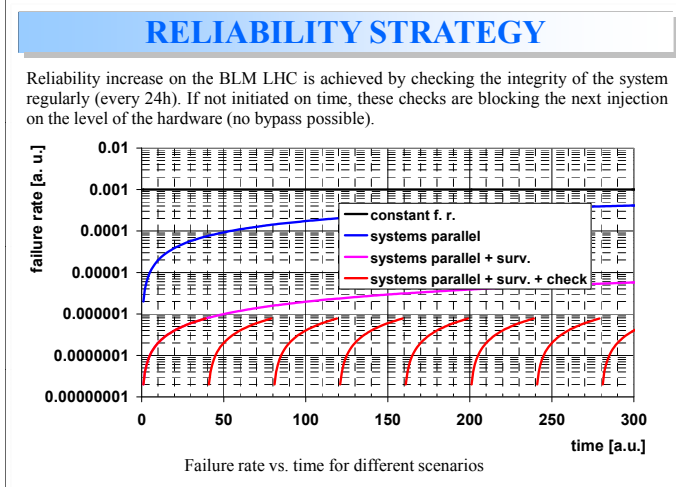
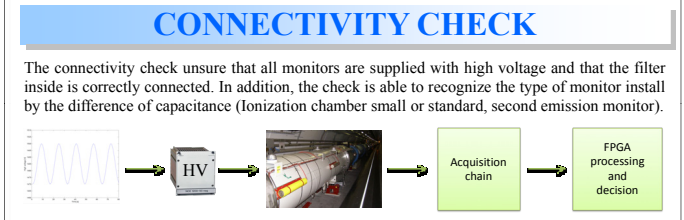
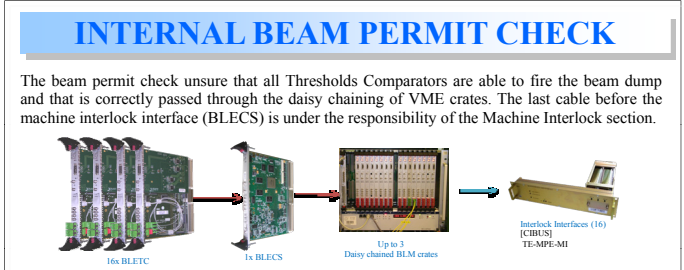
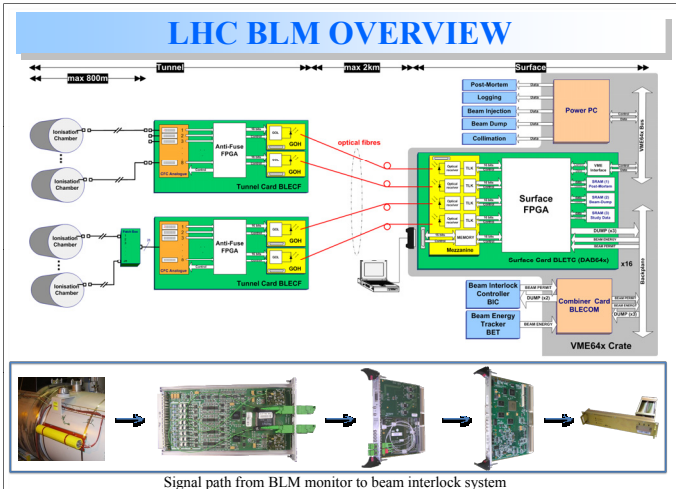




# FIRST EXPERIENCES WITH THE LHC BLM SANITY CHECKS

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**Abstract:** The reliability concerns have driven the design of the LHC BLM system from the early stage of the studies up to the present commissioning and the latest development of diagnostic tools. To protect the system against non-conformities, new ways of automatic checking have been developed and implemented. These checks are regularly and systematically executed by the LHC operation team to insure that the system status is after each test "as good as new". The sanity checks are part of this strategy. They are testing the electrical part of the detectors (ionisation chamber or secondary emission detector), their cable connections to the front-end electronics, further connections to the back-end electronics and their ability to request a beam abort. During the installation and in the early commissioning phase, these checks have shown their ability to find also non-conformities caused by unexpected failure event scenarios.



### KEY POINTS

The sanity check is integrated to the LHC pre-injection sequence executed at least every 24 hours. In case of non-conformity, the BLM system blocks the next injection.

The modulation voltage is now 30Vpp and 60mHz, which minimize the impact of this check on the system (no offset increase as in the first implementation)

The high repeatability of the connectivity check measurements allows detection of wider range of defects than expected (cables, monitors, electronics).

The internal beam permit check verify the ability of the threshold comparators to fire the dump through the complete BLM system.

The LHC BLM system is ready to be check regularly for its ability of transmitting the dump request to the interlock system (under the responsibility of TE-MPE-MI).

The reliability of the BLM system has been increased by its ability of auto-checking itself. The shutdown works are also gaining from this automatic functionalities.

### Complementary information

[1] Engineering Specification, "The Beam Interlock System For The LHC", LHC Project Document No. LHC-CIB-ES-0001-00-10, version 1.0, 17-02-2005.  
 [2] E. Effinger, B. Dehning, J. Emery, G. Ferioli, C. Zamantzas, "Single Gain Radiation Tolerant LHC Beam Loss Acquisition Card", Proceeding of DIPAC'07, Venice-Mestre, Italy.  
 [3] C. Zamantzas, B. Dehning, E. Effinger, J. Emery, G. Ferioli, "The LHC Beam Loss Monitoring System's Surface Building Installation", Proceeding of LECC'06, Valencia, SPAIN.  
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