

CERN-RRB-2010-028

23 MARCH 2010

# PRINCIPAL LHCC DELIBERATIONS

---

30<sup>TH</sup> MEETING OF THE CMS RESOURCES REVIEW BOARD

19 APRIL 2010

EMMANUEL TSESMELIS

SCIENTIFIC SECRETARY, LHCC

---

**GENERAL**

---

This document summarises the principal LHCC deliberations concerning CMS at the Committee's session in February 2010.

**The LHCC considers that CMS has made excellent progress in all aspects of the experiment and the Committee congratulates the CMS Collaboration on its achievements.**

---

**CONCERNS FROM THE PREVIOUS CMS RESOURCES REVIEW BOARD**

---

SUB-SYSTEM	CONCERN	STATUS
Resistive Plate Chambers	Demonstration that the gas recirculation can be implemented without increasing dark current remains outstanding and must be resolved.	The dark current of the Resistive Plate Chambers is stable.

---

**STATUS OF THE EXPERIMENT**

---

Following the successful cosmic-ray runs in 2008 and 2009 (CRAFT08 and CRAFT09), CMS has been very well prepared for LHC collision data taking. The availability of components, the level of internal alignment of detector components and the alignment of the components with respect to each other is astounding for a detector at start-up.

Consequently, the Collaboration has swiftly begun harvesting the physics: reconstruction of established resonances and giving evidence of the calibration and efficiency of the calorimeter and the precision of the vertex and tracking detectors. The  $P_T$ -distribution of jets has been extracted over several orders of magnitude. The distributions are well described by the simulation.

The CMS detector is in an excellent state. This achievement was only possible with a well-orchestrated effort from the Collaboration, a careful preparation of the detector and a meticulous attention to detail, of which the LHCC was presented with several examples.

There are a few low-rate noise problems in the calorimeter which CMS has been carefully monitoring and diagnosing. Noise in some hadron calorimeter Hybrid Photon Detectors (HPDs) has been presented before. However, a new problem has presented itself in the barrel electromagnetic calorimeter (EB) during running with beam. Techniques for handling and limiting the impact of the noise on the trigger rate and analysis are under development. CMS should continue with these efforts. Noisy events in the Pixel Detector have been traced to machine background, and CMS and the machine experts should work together to understand and eliminate this background.

Recently, CMS had to cope with several challenging situations:

- A corrosion induced water leak necessitated the replacement of 396 bushings to prevent water from spilling over a wide range of components. The replacement was carried out successfully during the Christmas technical stop. Fortunately, there was only limited collateral damage.
- A slightly misplaced pivot point during the installation of the Hadronic Forward Calorimeter (HF) led to inadvertent lifting of the beam pipe by several centimetres and corresponding stress on the vacuum system. The vacuum was not broken.
- Towards the very end of the last magnet power-up cycle, the HF jumped by 8 mm. There are indications that allowing more time for relaxation during the power up would allow for some of the sudden movements to be avoided. However, overall the situation remains unsatisfactory and is currently under investigation.

CMS has been designed to allow for easy access. This tremendous advantage both for maintenance and improvements of the detector has to be maintained now that the detector is complete. The precision movement of hundreds of tons of detector components requires highly-skilled personnel. CMS and CERN should work together to develop a solution that guarantees the availability of these experts when the need arises.

The Collaboration is pleased with the running schedule for the LHC, which foresees a smooth data-taking period for 2010 and 2011. The luminosity is sufficient to "rediscover" the Standard Model and prepare for new discoveries. The Collaboration has made plans for the summer conferences 2010 using two scenarios for integrated luminosity.

CMS, in conjunction with the CERN Management and ATLAS, should develop a plan for accelerator operations and performance so that both accelerator and experiments make the best possible use of technical stops and shutdowns. This plan will guide not only the upgrade planning but also form the basis of the physics planning of the experiment.