CERN-RRB-2002-012

27 March 2002

Summary of Principal LHCC Deliberations
(November 2001, January 2002 and March 2002 Sessions)

12th Meeting of the ALICE Resource Review Board
April 2002

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1. General

This document summarises the principal LHCC deliberations concerning ALICE at the Committee's sessions in November 2001, January 2002 and March 2002.

The LHCC considers that the ALICE Collaboration is following the schedule and milestones presented in the Technical Design Reports (TDRs).

2. LHCC Comprehensive Review

The second of the LHCC Comprehensive Reviews of ALICE took place on 11-12 March 2002. The LHCC referees addressed the following systems and areas: Inner Tracking System, Particle Identification, TPC, Calorimeters, Dimuon Forward Spectrometer, Forward Detectors, Trigger and DAQ, Offline Software, Physics, Test Beams, and the topics of Management, Technical Coordination, Integration, Schedules and Costs.

Since the first of the Comprehensive Reviews in January 2001, the ALICE Collaboration has made very significant progress towards the realisation of an experimental set-up ready to record heavy-ion collisions at the LHC. In particular, most of the detector technologies to be used, together with the associated electronics, have successfully gone through the R&D phase and a number of sub-systems are now well into the construction phase. Moreover, the LHCC considers that ALICE has addressed satisfactorily the concerns of the LHCC at the first Comprehensive Review.

The conclusions and concerns of the LHCC are given below. They will allow the Committee to follow-up outstanding issues and to monitor future progress of this project in upcoming sessions of the LHCC prior to the next ALICE Comprehensive Review.

- Good progress was reported on all elements of the Inner Tracking System – Silicon Pixel Detector (SPD), Silicon Drift Detector (SDD) and Silicon Strip Detector (SSD). The single major concern is the timely development and completion of the HAL25 front-end chip for the SSD.

- Progress in the particle identification detectors was demonstrated. The LHCC will, however, continue monitoring various issues, focusing on the possible new position of the High Momentum Particle Identification Detector (HMPID) and the front-end electronics for the Time-of-Flight detector (TOF). The Committee will review the Addendum to the TOF TDR through the spring.

- The LHCC noted the good progress in the Time Projection Chamber (TPC) project and has no major concerns.

- The LHCC noted good technical progress with the Photon Spectrometer (PHOS), the Zero Degree Calorimeters (ZDCs) and the Photon Multiplicity Detector (PMD). However, the Committee expressed its concern regarding

the level of available funding for the PHOS and the extent of the changes to the PMD. For the latter, the Committee has requested documentation detailing the modifications.

- The Committee noted the good technical progress in the Dimuon Forward Spectrometer project but expressed a major concern regarding the cost increases and the resulting the delay in the muon absorber due to the re-design activities.

- The LHCC noted that the forward detectors are becoming better defined. Although the design of the detectors is advancing, many details still need to be finalised. The LHCC requests the submission of TDRs for these forward detectors.

- Considerable progress was reported for the Trigger/DAQ project. The primary concern of the LHCC lies with the incomplete list of milestones for the overall Trigger/DAQ project and the as-yet to be implemented coordination structure for the High Level Trigger (HLT).

- The ALICE Offline Software project is advancing well and has a sound organisation. The LHCC did, however, note the necessity to ensure that adequate manpower is available to provide support for the software tools.

- The LHCC took note of the well-organised ALICE test beam structure and of the collaboration's test beam plan for the coming years.

- The Committee is satisfied with the progress on the physics issues and awaits the submission of the Physics Performance Report at the end of 2002.

- The LHCC considers that ALICE is progressing well in the areas concerning the management and technical coordination structure, the integration and schedule issues. The Collaboration has adopted measures to control increases regarding the cost-to-completion. The Committee will continue monitoring developments in these issues.

3. Dipole Magnet

The Magnet Advisory Group to the LHCC (MAG) submitted a written document providing an update on the status of the LHC spectrometer magnets. The review is not yet finalised and agreed to by the LHCC. However, the MAG has no major concerns regarding the ALICE dipole magnet.

4. Transition Radiation Detector (TRD)

The LHCC recommended general approval of the ALICE Transition Radiation Detector TDR. However, the Committee takes note of the current funding situation as described in the ALICE MoU, which makes available funds corresponding to about 58% of the total detector surface area but with no contingency. The LHCC, therefore, recommended construction of the `Short Asymmetric' version as described in the TDR which consists of three out of the five azimuthal rings. The LHCC considers the schedule given in the TDR and the list of milestones in an ancillary document to be reasonable. The Research

Board approved the submitted TDR under the above formulation at its February session.

5. LHC Computing Grid Project

The LHCC recommended that the LHC Computing Grid Project be treated by the Committee in a manner similar to that for the experiments. Therefore, the LHC Computing Grid Project will make available to the LHCC for review, documents and reports from the project, including its TDR. As a first step, and following the appointment of referees, the Committee will analyse the relation between the detector parameters and computing requirements, including the expected experiment trigger rates as a function of the machine luminosity. The procedure will be performed in consultation with the LHC experiments. The LHCC and the management of the LHC Computing Grid Project agreed to the above scheme of interaction between the Committee and the Project.

6. Test Beams

The requests from the LHC experiments to use test beams in the years 2003 to 2006 have been scrutinised by the LHCC at its January meeting and also in a dedicated meeting held on 14 February.

The LHCC believes that test beams are necessary in 2003 and 2004 for all LHC experiments to calibrate the final calorimeter modules, to perform the integration of the modules in the detectors, to validate the latest versions of the front-end read-out electronics and DAQ chain, to monitor the quality of the detector construction and to test the alignment procedures.

The Committee also believes that in the case of ALICE, ATLAS and LHCb, there are no compelling reasons to use test beams in the year 2005. The CMS test beam requirements in the years 2004-2006 are driven primarily by the calibration of the Electromagnetic Calorimeter (ECAL). The experiments have therefore been asked to proceed with their test beam programme assuming that beam will be available only in 2003, 2004 and 2006, where the operation of the SPS in the latter year is also required to commission the machine as an injector for the LHC.

The LHCC also recommends keeping the PS Complex operational in 2005 in order for the experiments to be able to perform final tests and calibrations that do not require the higher energy particles available at the SPS.