

CERN, 14 October 2019

## MEMORANDUM

From: Federico Antinori  
To: Eckhard Elsen  
cc: Fabiola Gianotti, Luciano Musa  
Subject: Procurement of the ALICE TPC CRUs



Ok. E. Elsen, 15.10.19

**Prof. Eckhard ELSSEN**  
**Director for Research and Computing**

This memorandum outlines a plan for the completion of the procurement of the Common Readout Units (CRUs) for the upgrade of the ALICE TPC during LS2.

The upgrade of the ALICE TPC in LS2 entails a completely new readout system, which consists of 3600 front-end cards and 390 CRUs. The CRU is also used for the readout of most of the other ALICE detectors. The Department of Atomic Energy (DAE) and the Department of Science and Technology (DST) of India have entered in an agreement with CERN (Addendum 41 to the MoU for Collaboration in the Construction of the ALICE Detector, CERN-RRB-2016-002) to contribute to the ALICE TPC upgrade project with the procurement of the CRUs, for a total value of 2 MCHF. The ultimate deadline for the delivery of the full quantity of CRUs is March 2020. A delivery beyond this date would lead to a corresponding delay in the overall upgrade schedule and eventually on the readiness of ALICE for RUN3.

Due to difficulties of administrative nature in organizing the procurement of CRUs in India, the only option left to meet the above deadline is to resort to an established production line, namely to extend the production in the French company that is currently producing CRUs for the rest of the ALICE detectors and for LHCb.

The ALICE and CERN managements have therefore requested DAE and DST to authorize CERN to issue the purchasing order to the French company on their behalf. That discussion is still ongoing and there is a risk that DAE and DST might fail to keep their commitments in good time for ALICE to complete its upgrade programme on schedule.

Prompt placement of the purchase order has now become vital for ALICE. Therefore, we propose to proceed with issuing the order without further delay. In case DAE and DST were to ultimately fail to honour their commitments, we would have to agree with the ALICE Funding Agencies on alternative funding schemes. In case no other funding scheme were viable, we propose the following worst-case plan.

ALICE would make use of the funds for the long-term maintenance of the online computing hardware. The funding plan is based on a flat budget of about 1.1 MCHF/year over the period 2019-2026, for a total of 8.8 MCHF, to allow the replacement of all hardware at the end of 2026. ALICE would withdraw from that budget the 2 MCHF needed to complete the procurement of the CRUs during LS2. The implication would be that in 2026 only 77% of the online hardware could be replaced. This could result, at worst, in a reduced performance of the ALICE online system, up to 23%.

Such a plan requires a formal endorsement by the RRB following a review by the Scrutiny Group. Therefore, its implementation could start at the earliest after the upcoming RRB

meeting at the end of October, which would lead to a delay of at least one month in the ALICE commissioning plans.

In order to avoid such a delay, we ask the CERN management and the RRB Chair to endorse the plan outlined above authorizing ALICE to place the purchasing order for the CRUs before the formal endorsement by the RRB.

It is understood that the ALICE management is committed to continue with the highest priority, jointly with the CERN management, the discussions to persuade the Indian authorities to fulfil their commitments in a timely manner.

Director for Research and Computing