Short Summary on CERN Scientific Policy Committee Meeting 13 -14 December 2016

by T. Nakada on behalf of the members

15 December 2016

The LHC matters were presented by the Director for Accelerators and Technology for the status of the LHC machine and CERN accelerator complex, by the Director of Research and Computing for the status of the LHC experiments and by the project leader of the Worldwide LHC Computing Grid for the status of the LHC computing. In 2016, the LHC experiments collected much more data than anticipated and the SPC enthusiastically congratulates the machine team and experiments for this extremely impressive performance. Not only the pp run, but also the proton-Pb run was very successful.

It is worth noting the effort of the LHC experiments and software support team to cope with this increased data volume by improving the software performance and using computing resources more efficiently. The experiments managed to utilise significantly more resources than formally pledged in 2016. However, the 2017 and 2018 resource requirement exceeds the current plan by about 20%. This is noted by the funding agencies who responded on a best effort basis, but further efforts by the experiments and funding agencies will be needed to ensure the full exploitation of the data. While the computing needs in Run-3 are considered to be still manageable, a considerably large shortfall is anticipated in the High Luminosity LHC (HL-LHC) era, which requires significant evolution of the infrastructure, computing models and software performance. The SPC strongly supports the effort by the WLCG team and experiments in all areas of the computing. Software development becomes increasingly important and should be recognised as one of the fundamental elements of experimental physics. Prospects for a longterm career for those people contributing to this area should be improved.

The committee heard a presentation by the Chair of the CERN Machine Advisory Committee (CMAC) on the outcome of the LHC Injector Upgrade (LIU) and HL-LHC Cost and Schedule Review recorded for this SPC meeting. As the CMAC, the SPC is very much impressed by the progress made by the CERN machine team and fully concurs with the CMAC conclusions and recommendations. While the cost seems to be under control without compromising the machine performance, the human resources are critical. The SPC stresses a particular importance for timely execution of the civil engineering work, since this work can only be done during the long shutdown period. Any slippage in this schedule might result in a large delay of the HL-LHC project. The committee encourages the management to vigorously monitor the progress and being ready to intervene for any sign of delay. It is worth noting that some of the detector and machine components have a limited lifetime due to radiation damage, which requires the upgrade.

In order to secure the necessary technical personnel, a plan to temporarily increase the total number of CERN staff with limited duration contract by a small amount, ∼80, was presented by the Director General. Over the past years, the SPC has been expressing deep concern on the lack of technical personnel at CERN. The committee is pleased to see that a step is taken to mitigate the situation and therefore strongly supports this initiative. This is particularly well timed given the outcome of the LIU and HL-LHC cost and schedule review. The SPC also encourages the management to make sure that the technical expertise developed with this temporary measure will be preserved.

Time frame for the next update of the European Strategy for Particle Physics and one amendment to the applicable procedural framework was introduced by the Council President. The SPC fully endorses the proposal.

Some of the driving factors of the Medium-Term Plan for the period 2018-2022 were presented by the Director General and the committee is looking forward to a more detailed presentation in the March meeting followed by the White Paper discussion in the May meeting.

The committee heard a presentation by the outgoing SPSC Chair summarising the experimental activities at the SPS, PS and AD/ELENA accelerator facilities. It shows that CERN has been maintaining a healthy particle physics programme in parallel to the LHC. The Physics Beyond Colliders initiative, which has started recently, will prepare for an input to the European Strategy Update on the scientific potential of such facilities in the future. The committee also heard presentations on the AWAKE experiment and an update of the T2K-II/Hyper-K. The former is an R&D project for plasma acceleration using the SPS proton beam to excite plasma wake fields to achieve an extremely high acceleration gradient of $O(1)$ GeV/m. The experiment has just succeeded to generate plasma wake field and plans to accelerate an electron beam in the coming years. The committee is impressed by the rapid progress made by the collaboration. The latter is a Japanese long baseline neutrino programme: T2K-II is an approved programme with an upgraded T2K detector and an increased JPARC proton beam, which could detect evidence of CP violation in the neutrino oscillation. The Hyper-K experiment has been recently re-optimised to reduce its cost without compromising the physics performance. Once approved, the detector will be able to perform a broad neutrino physics programme, beyond the measurement of the oscillation parameters.