



April 2020

Plenary RRB

Minutes of the 50th Plenary Session of the
LHC Resources Review Boards
CERN, Geneva, 27th April 2020

Documents can be found in <https://indico.cern.ch/event/886252>.
The meeting was held entirely as a video meeting.

The minutes, CERN-RRB-2019-127, of the last Plenary Session were approved.

CERN Status and News. E. Elsen, Director for Research and Computing.

E. Elsen presented the composition of the Scrutiny Group and the Computing Scrutiny Group for 2019 - 2020.

The May 25, 2020 meeting in Budapest for the release of the European Strategy has been canceled, now the June Council 2020 meeting will be used for the release of the update of the European Strategy of Particle Physics.

The September Council meeting will be used to conclude on the MTP.

There were no questions following this presentation.

LS2 and Run-3 Schedule after Revision - Status of the Experiments. E. Elsen, Director for Research and Computing.

Summary:

Reminder of the main decisions in the meeting with the four LHC experiments and the CERN management held in November 2019:

- Extend Run-3 by one year - such that 2024 is included in Run-3 and the start of LS3 is in 2025.
- Extend LS2 by two months - such that the experimental caverns will be closed by May 1, 2021.
- Review the ATLAS NSW status in early June 2020: Check the readiness of NSW-A and the prospects of NSW-C, fix the NSW installation strategy and schedule and decide on final length of LS2.
- Consider to drop one of the ion runs after 2021 and to attach it to the scheduled ion period in 2024.
- Decide on the final beam energy after the magnet training at the end of the extended LS2.

After arrival of COVID-19, CERN was put in safe mode for the lock down on March 20, 2020. Most people are teleworking, only very restricted access to CERN sites possible. Video conferencing is largely used, Analysis, CAD design work and software developments are continuing unhindered.

The above schedule will have to be adapted after more experience has been obtained from the restart after the end of the lock down. The restart scenarios at CERN:

- Phase-0: lock down (intense preparatory work continues from home).
- Phase-1: cautious resumption of selected high priority activities (few people, physical distance), starts now.
- Phase-2: teams are coming slowly back (physical distance, hygienic precautions), start time and details will be presented on May 5, 2020.
- Phase-3: staff and users back at CERN, depending on travel conditions and restrictions.

The CERN safety rules will be updated for COVID-19 measures. Personal Protection Equipment (PPE), namely masks, safety glasses, face shields, ..., has been ordered.

The uncertainty in availability of CERN users for the experiments affects LS2 scheduling significantly. The experiments have been encouraged to apply creative planning and to use flexibility in composing teams.

Impact at CERN: the time in Phase-0 will translate into a linear delay in areas where physical interventions are needed. In some areas (e.g. design work or ASIC development) one may even profit from extra time and some activities may be addressed earlier than planned due to the additional time during lock down.

A Joint LHC and Experiments meeting on June 8, 2020 is planned to discuss startup scenarios and possible LHC running configurations during Run-3.

The material funding for LS2 should be largely unaffected as most purchases for LS2 have been done, except for the computing infrastructure where late procurement is prudent. Maintaining the workforce has a cost. Therefore, the overall cost for the Phase-II upgrade will increase. It is too early to give a full assessment.

Concerning progress of the upgrades there is a clear need of expert teams for the LHC experiments. These experts are in part supported out of the Common and M&O funds. In the long-term view, we need better ways to provide sustainable solutions for supporting such activities in the experiments.

M. Fleischer raised the point, that on the long-term the LHC collaborations should think about how to allow certain work to run the LHC experiments from offside with video technologies.

E. Elsen replied that a few months ago the AMS collaboration carried out repair work on the detector remotely from the control center at CERN in which a mock-up was used to actually see and to guide the astronauts in space. While this may be an extreme and not representative example the experiments will explore such possibilities since they will try to make progress during this period.

Accelerator Status during LS2. F. Bordry, Director for Accelerators and Technology.

Summary:

All LS2 activities for the accelerators were on time on March 6, 2020 with respect to the LS2 master schedule (v.2.4) including the last diode-box consolidation and the HL-LHC civil engineering activities. Before locking down, all maintenance, consolidation and upgrade work was safely stopped. Baseline services such as ventilation, cooling, electrical supply, safety systems were kept running and all material and equipment were put in a secure state to be able to restart smoothly.

The restart scenario was outlined: During Phase-1 of the restart, urgent activities are scheduled with up to some hundred persons on site. After May 18, 2020 LS2 work will be resumed with initially around 1000 persons on site. After around 16 weeks, CERN should be all open again. The civil engineering activities for HL-LHC projects at Point 1 (ATLAS) and Point 5 (CMS) have already restarted.

A first version of the new LS2 machine schedule was presented indicating that the start of the beam itself in LHC could be September 2021.

There were no questions arising from this presentation.

Report from the Scientific Computing Forum. E.Elsen, Director for Research and Computing.

Summary:

On February 13, 2020, the latest Scientific Computer Forum was held, where several quantum computing (QC) initiatives were presented: Quantum computing science of IN2P3, lattice gauge theory applications for QC at DESY, the Oak Ridge National Laboratory's quantum information science group and quantum technology initiatives at CERN. A discussion on the role of QC for HEP and beyond followed. Considerable interest in algorithmic developments was expressed. The Quantum Initiative will be brought to the next Council meeting with the goal of launching a more comprehensive initiative jointly with the users and their institutions.

A. Aprahamian was pleased to hear about the quantum computing in high energy physics, and claimed that quantum computing is blossoming in many different areas. As E. Elsen mentioned some experimental fields, the question was if there are some concrete high energy physics experiments that are coupled to the quantum computing theory effort? It would be very interesting to see how the field is going to develop. How is the quantum computing initiatives coupled to the gravitational wave or dark matter effort?

E. Elsen answered that dark matter searches could be a first laboratory in which quantum sensing may be employed because of the high sensitivity of entangled states. It will be difficult to extend this to the more complex readout of multichannel HEP detectors on the short run.

H. Prosper asked if there any discussions ongoing about the possibilities of collaborations, for example between Oak Ridge and CERN regarding quantum computing.

E. Elsen explained that contacts with various laboratories have already been established, but the initiative in the US is a larger one. For example, recently the NQI competition has been launched embracing several US-laboratories and Universities. CERN is very positive towards this development. After the positive echo from the SCF he plans to bring the topic to the attention of CERN Council to seek broader support from e.g. the member states. Quantum Computing meets a lot of enthusiasm amongst young people.

Summary. E. Elsen, Director for Research and Computing.

There being no further business, the Chairperson closed the meeting. The proposed dates for the next RRB are 26-28 October 2020.

Reported by W. Funk