Draft Minutes of the 43rd Plenary Meeting of the LHC Resource Review Boards (RRB)
(CERN, Geneva, 24th October 2016)

Documents and slides of all presentations can be found on the RRB Indico pages; accessible via the LHC-RRB home page http://cern.ch/committees/LHCRRB

1. Welcome and Approval of the minutes of the last meeting. E. Elsen, Director for Research and Scientific Computing
CERN-RRB-2016-063

E. Elsen welcomed the delegates and the CERN management to the plenary meeting of the RRB.

The minutes of the last Plenary Session CERN-RRB-2016-063 were approved.

2. CERN Status and News. E. Elsen, Director for Research and Scientific Computing
F. Gianotti (Director General) presented the news since the last RRB meeting:

- Council formally approved the HL-LHC at the June meeting.
- At the September meeting, Council approved the request from the Directorate to open a credit line with the European Investment Bank to deal with the cash shortage that will occur during the peak years of the HL-LHC construction.
- The LHC is working very well. The TDRs for the Phase II Upgrade will come next year. At this RRB there will be a discussion about computing where resources are stretched because of the good performance of the LHC.
- The DG thanked the Funding Agencies's for their support and wished for a productive meeting.

There were no questions arising from this presentation.

3. LHC Machine Status. F. Bordry, Director for Accelerators and Technology
CERN-RRB-2016-071 (slides)

Conclusions:
LHC is operational at 13 TeV; ~ 40 fb^{-1} collected to date

- 25ns operation
- $\beta^* = 40$ cm in ATLAS and CMS; 3m in LHCb; 10m in ALICE
- Going towards combining ramp & squeeze
- Rapid intensity ramp up despite several technical problems

Nominal design luminosity $1x10^{34}cm^{-2}s^{-1}$ reached and exceeded ($1.4x10^{34}$)

- Optimisation of the integrated luminosity (availability ~ 60%)

Run 2 goal: > 100 fb^{-1} and to reach 300 fb^{-1} at the end of RUN 3.

LHC Injector Upgrade (LIU → LS2) and High Luminosity LHC (HL-LHC → LS3) well defined and now in construction phase.

There were no questions arising from this presentation.

4. M&O Scrutiny Group Report. C. Touramanis (Chair, LHC Resources Scrutiny Group).
CERN-RRB-2016-073 (report), CERN-RRB-2016-074 (slides)
Summary:

The Scrutiny Group recommends the approval of the 2015 M&O closing reports of ALICE, ATLAS, CMS, LHCb and TOTEM.

The Scrutiny Group recommends the approval of the 2017 M&O budget requests of ALICE, ATLAS, CMS, LHCb and TOTEM.

The SG acknowledges the central role of the Resource Coordinators of the Collaborations in carrying out the annual scrutiny process and wishes to thank them for their time and effort and for their positive and collegial approach.

A. Medland: Thanked the Scrutiny Group for their report and noted the positive engagement from the experiments. How might the M&O costs evolve with the Upgrades during and post LS2?

C. Touramanis: As an example ALICE have estimated that operations of their new, larger online-offline computing system post-LS2 will require more staff leading to an increase of 11% on their total M&O A budget of 4.7 MCHF. A common issue for all experiments is that they will be installing more powerful online-offline computing systems in LS2 whose replacement in LS3 will cost more. In anticipation of this ALICE have already started saving in their special online replacement account. The expected level of post-LS2 M&O A costs, and measures to avoid large steps at any single point in time will be discussed with each experiment in the 2017 review cycle.

E. Elsen: The planning for the Phase I and II Upgrade budgets is difficult. We understand that the Funding Agencies would like to see continuity within a flat budget but the expenditures vary over time. Detailed discussions will be held with the experiments.

M. Fleischer: The RRB delegates request a timely submission of the scrutiny report, if possible 2 weeks prior to the RRB meeting.

E.Elsen: This will be done.

5. Computing Resources Scrutiny Group Report. D. Lucchesi (Chair, WLCG Resources Scrutiny Group)
CERN-RRB-2016-128 (report), CERN-RRB-2016-129 (slides)

Comments and recommendations: 2017

- The experiments have worked to mitigate the impact of the increased LHC live time but it is unreasonable to expect them to be able to keep pace with the rapid increase in LHC performance within a flat budget.
- C-RSG considers the requests of the experiments adequate for the physics program approved by LHCC.
- The experiments consider of highest priority to have resources at Tier-0, tape and disk space at Tier-1 and Tier-2 are the next highest priority.

Comments and Recommendations: 2018

- Since the experiments are studying possible strategies to further optimize their use of computing resources the C-RSG does not consider that they can give recommendations on the likely level of resources that will be required in 2018.
- The C-RSG asks Atlas and CMS to study the impact of parking data on the competitiveness of their physics and their ability to process it in 2019.
- The C-RSG recommends that Atlas and CMS work towards a common policy on utilising their computing resources in the period leading up to LS2 (2017-2018) in order to most efficiently use CPU resources during this shutdown (2019-2020).

H. Prasse: The former CERN management stated that with an improving LHC performance, the computing costs would remain within a flat budget. Thus Germany plans with a flat budget. The experiments need to continue to investigate new ideas to achieve an efficient data processing within the given budget.

D. Lucchesi: 2017 is a special year because we did not expect the LHC performance of 2016. We hope we can go back to a flat budget in 2018. That is why we are asking the experiments to work together, in particular ATLAS and CMS because they have the largest impact on the computing resources.

E. Elsen: The integrated luminosity until LS2 has not changed, but we got a larger share than expected in 2016. We hope that technology improvements can mitigate the problem. We want to record all the physics but we are not committed to analyse the data immediately. This gives us some flexibility over time. However, using any end of year left over money in the budget to soften the problem would be welcome.

M. Fleischer: Why does ATLAS request 30% more CPU, but CMS only 10%?

D. Lucchesi: The two experiments have different computing models. ATLAS needs more resources for Monte Carlo. We asked the experiments to have a common strategy from 2018 onwards, and so from 2018 this discrepancy will narrow.

A. Medland: Each experiment has taken different strategies to mitigate the increase in computing requirements each with considerable success. What actions are being taken to make sure that ATLAS and CMS share their solutions to cope with the increased LHC performance?

D. Lucchesi: We are planning to work with the experiments from now till February when the new report has to be submitted.

E. Elsen: We do not want resources destined for the Upgrade to be used for computing. The Upgrades are the highest priority: Phase I for LHCb and ALICE and Phase II for ATLAS and CMS.

A. Medland: The LHC has delivered far in excess of the target integrated luminosity for 2016, but it is not the intention to increase the total target for Run 2. How is this additional dimension to help manage the increased computing requirements being explored?

E. Elsen: Progress in technology will help a few percent. Then we have to make sure that the experiments can at least record all data.

A. Zoccoli: For 2017 we may find some extra resources to help the experiments, but it is important that for 2018 the experiments, the Scrutiny Group and the LHCC work together in order to find a strategy.

E. Elsen: This point has been taken.

V. Guelzow: Is the WLCG Tier model still efficient or should it be adapted?

E. Elsen: In the longer term the Tier model will evolve into a new system probably incorporating the cloud concepts.

6. Main LHCC Deliberations on Phase-II Upgrades. F. Forti (Chair, LHC Experiments Committee)
CERN-RRB-2016-072 (slides)

Summary

- The approval process for Phase II upgrades is progressing as planned.
- TDRs will start coming at the end of 2016.
- The process is continuously monitored and unitarity verified.
- The funding prospects are reasonable, although it will be very challenging to build these upgrades.
- Computing must undergo significant evolution to cope with huge data volume.

H. Prasse: You stated that the core costs match the funding from the Funding Agencies. Does this mean 100% of the medium scenario and how certain is it?
F. Forti: The planning figures for the Funding Agencies cover almost (95%) of the reference scenario (the highest). The risk associated with the figures is a different question.
E. Elsen: The complete money matrix with almost 100% certainty will be published with the TDRs. The timescale for this is at the latest by April 2018 and for most of the big ticket items before.

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

There being no further business, E. Elsen thanked the delegates and closed the meeting. The proposed dates for the next RRB are 24-26 April 2017.