

CERN/DG/Research Board 2007-379

Minutes 180

19 June 2007

ORGANISATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE
CERN EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

CERN RESEARCH BOARD

**MINUTES OF THE 180th MEETING OF THE RESEARCH BOARD
HELD ON WEDNESDAY 7 JUNE 2007**

Present R. Aymar (Chairman), L. Alvarez-Gaume, J. J. Blaising, J. Engelen,
M. Ferro-Luzzi, R. Forty (Secretary), E. Heijne, P. Lebrun, M. Mannelli
(replacing J. Dainton), S. Myers, C. Rembser, L. Robertson (replacing
W. von Rüden), E. Tsesmelis (replacing S. Bertolucci)

Invited C. Rubbia, D. Froidevaux

Apologies P. Ciriani, L. Evans, L. Fraile, M. Huysse

Items

1. Procedure
2. Application of WArP to become a Recognized Experiment
3. Report from the LHCC meetings of 21-22 March and 9 May 2007
4. Report from the SPSC meeting of 17-18 April 2007
5. Any other business

1. PROCEDURE

- 1.1 The **minutes** of the Research Board held on 21 February 2007 [1] were approved without modification.
- 1.2 Under **matters arising** from those minutes, it was noted that in paragraphs 5.3 and 5.4 the P330 proposal for a pilot run using the NA49 apparatus, and the P326 proposal for the measurement of R_K , had both been approved subject to the availability of the resources required from CERN, to be decided following consultation by the CERN directorate. R. Aymar stated that the resources had been found for both experiments to run during 2007. They will be known as **NA61** (for P330) and **NA62** (for P326). The other experiment approved at the last meeting (P327, for the study of electromagnetic processes in strong crystalline fields) will be known as **NA63**.

2. APPLICATION OF WArP TO BECOME A RECOGNIZED EXPERIMENT

- 2.1 C. Rubbia presented the WArP experiment (WIMP Argon Programme), a large mass liquid argon detector under construction at the Gran Sasso laboratory [2]. It is designed to detect the recoil of argon ions when struck by weakly-interacting massive particles (WIMPs), candidates for the explanation of dark matter. A prototype containing 2.3 litres of natural argon is already taking data, and the next phase will use 100 litres of purified argon. C. Rubbia stressed the complementarity of this project to the search for the production of such particles at the LHC.
- 2.2 D. Froidevaux then gave his report as CERN rapporteur. The requests from the experiment are modest, including the use of some laboratory space, consultancy on electronics, data handling and simulation of low-energy interactions in liquid argon, and the use of a CERN account for payments. The next phase of the experiment is fully funded. **The Research Board granted recognized experiment status at CERN to WArP, with reference number RE15. This will be reviewed after a period of three years.**

3. REPORT FROM THE LHCC MEETINGS OF 21-22 MARCH AND 9 MAY 2007

3.1 E. Tsesmelis reported on the recent LHCC meetings [2], including the status of ATLAS, CMS, LHCb, TOTEM, LHCf, and the LCG, and a Comprehensive Review of ALICE [3]. **The Research Board took note.**

3.2 He then discussed the status report from R&D project **RD42**, for the development of diamond tracking detectors for high luminosity experiments at the LHC [4]. The LHCC agreed to the continuation of RD42 in 2007, and this was **endorsed by the Research Board.**

4. REPORT FROM THE SPSC MEETING OF 17-18 APRIL 2007

4.1 M. Mannelli reported on the recent SPSC meeting [2], including the annual reviews of DIRAC, CLOUD and CAST. The SPSC endorses the conclusions of the recent report commissioned by CERN and the major funding agencies into issues related to the analysis of data from the HARP experiment. **The Research Board took note.**

4.2 Concerning OPERA, the assembly of target bricks is now progressing satisfactorily, with the prospect of completing installation next year. Three weeks are scheduled for the commissioning of high intensity operation of the CNGS beam, starting in September this year.

4.3 Concerning COMPASS, the SPSC encourages the completion of the muon physics programme. The hadron programme is being re-evaluated by the committee.

4.4 Proposal P331 concerns the use of a prototype LHC main dipole magnet in the search for QED vacuum birefringence, axions, and photon regeneration [5]. The SPSC recommended for approval the 2007 programme of the experiment, for the study of photon regeneration. **This was approved by the Research Board; the experiment will be known by the name OSQAR.**

5. ANY OTHER BUSINESS

5.1 The **next meeting** of the Research Board will be held on 10 September 2007, at 14:00.

ENCLOSURES

1. Minutes of the 87th LHCC meeting held on 21-22 March 2007 (LHCC-2007-015/LHCC-87)
2. Draft Minutes of the 88th LHCC meeting held on 9 May 2007 (LHCC-2007-019/LHCC-88)
3. Draft Minutes of the 81st SPSC meeting held on 17-18 April 2007 (SPSC-2007-016/SPSC-081)

REFERENCES

- [1] Minutes of the 179th meeting of the Research Board (CERN/DG/RB 2007-378/M-179)
- [2] Copies of the transparencies are available from the agenda at:
<http://indico.cern.ch/conferenceDisplay.py?confId=16579>
- [3] ALICE Comprehensive Review report (LHCC-2007-016/G-132)
- [4] Status report RD-42: Development of Diamond Tracking Detectors for High Luminosity Experiments at the LHC (LHCC-2007-002/RD-012)
- [5] OSQAR: Optical Search for QED Vacuum Magnetic Birefringence, Axions and Photon Regeneration (SPSC-2006-035/P-331)

LARGE HADRON COLLIDER COMMITTEE

Minutes of the eighty-seventh meeting held on
Wednesday and Thursday, 21-22 March 2007

OPEN SESSION:

1. LHC Status Report: Emmanuel Tsesmelis
2. Early TOTEM Running with the 90 m. Optics: Karsten Eggert
3. MOEDAL Status Report: James Pinfold

CLOSED SESSION:

Present: S. Bertolucci (Chairman), J.-J. Blaising, P. Dauncey, S. de Jong, J. Engelen, M. Ferro-Luzzi, F. Forti*, M. Gonin, J. Knobloch, M. Mangano, R. Mankel, M. Martinez-Perez, P. Mato, C. Niebuhr, B. Peyaud, C. Rembser*, S. Smith, E. Tsesmelis (Secretary), R. Yoshida

Apologies: S. Dalla Torre, J. Haba, V. Kekelidze

* part-time

1. PROCEDURE

The minutes of the eighty-sixth LHCC meeting (LHCC 2007-004 / LHCC 86) and the report from the LHCb Comprehensive Review (LHCC 2007-007 / LHCC-G-126) were approved.

2. REPORT FROM THE CHIEF SCIENTIFIC OFFICER

The Chief Scientific Officer (CSO) reported on the status of the LHC machine installation and commissioning. Installation of the LHC machine is proceeding well and the project is advancing towards meeting its milestone for closure at the end of August 2007, albeit on a tight schedule. Cool-down of Sector 7-8 is well-underway. The engineering run at 450 GeV beam energy for the end of 2007 remains the top priority. Communication channels between the LHC machine and experiments is considered to be very important and to this end the LHC Installation and Commissioning Committee (ICC) and the LHC Experiment Machine Interface Committee (LEMIC) are two forums to exchange information between the LHC machine and experiments. Discussions on the White Paper are continuing and more information is expected in time for the Council Week of June 2007.

3. REPORT FROM THE ATLAS REFEREES

The LHCC heard a report from the ATLAS referees, concentrating on the status of installation and of the Inner Detector, and on the review of the power supplies and the online and offline data quality monitoring.

The Committee heard a report on the status of the ATLAS installation. Installation of the Barrel Muon chambers is nearing completion and the End-cap Muon chamber installation is now progressing on both sides. The first End-Cap Toroid (ECT) has been transported from Hall 191 to the external test station in front of Building 180 where it is being cold-tested

mechanically at LN temperatures following a smooth cool-down phase. The integration of the second ECT is advancing well with the cold mass having been inserted into the vacuum vessel.

The referees reported on the status of the Inner Detector. The Barrel Transition Radiation Tracker (TRT) and Semiconductor Tracker (SCT) are installed while the End-Cap TRT and SCT are now ready for installation after being integrated and tested. The Pixel detector together with the beryllium experimental beam pipe will be ready for installation in May 2007. The critical issue is with the failure of the heaters of the SCT evaporative cooling system. Ingress of moisture in the power unions and then in the MgO powder that insulates the heating wire from the inox sheath caused a short to ground destroying the power union. Analysis of the failure is in progress and repair plans, together with the impact on the ATLAS schedule, are being developed.

The LHCC heard a report on the ATLAS power supplies. Progress was reported on the resolution of outstanding issues. The repair of the low voltage supplies for the Tile Calorimeter is now well-defined and production of the retro-fitted units is now underway. The schedule to complete the low voltage power supplies for the LAr Calorimeter remains critical. A new strategy is being implemented to solve the difficulties and consists of awarding a new contract imminently and developing a back-up plan based on two options. The delivery schedule for the Muon System power supplies still does not satisfy the requirements and at the current rate only a partial power supply configuration will be available for 2007. Previous concerns regarding the power supplies for the Inner Detector and LAr Calorimeters have been resolved successfully.

The referees also reported on the ATLAS data quality assessment and monitoring (DQ). The infrastructure for these tasks is being put in place and ATLAS is initially using Monte Carlo samples to develop the appropriate tools. The LHCC acknowledges the global approach to DQ taken by ATLAS. Much remains to be done but it is expected that the most critical pieces will be available by summer 2007.

4. REPORT FROM THE CMS REFEREES

The LHCC heard a report from the CMS referees, concentrating on the status of the CMS sub-detectors and on the review of the High Level Trigger.

The referees reported on the status of the CMS sub-detectors. The Tracker has been completely tested and integrated into the Tracker Support Tube. Running with cosmic-rays at the Tracker Integration Facility (TIF) has been highly successful and about 400,000 cosmic-ray triggers are being reconstructed for analysis. The simultaneous alignment of all pixel and strip modules has started to be performed with *Millipede II*. Good progress was reported on the Electromagnetic Calorimeter (ECAL). All crystals for the Barrel ECAL (EB) have been received and all Supermodules will be completed by mid-April 2007. Crystal production for the End-Cap ECAL (EE) has started at both producers. Agreement with BCTP for the final crystals for the EE has been reached and delivery of the crystals is expected to be finished by the end of February 2008. Integration of the ECAL is also advancing well. Production of the new motherboards is well-underway and the already-produced units are of excellent quality. Fourteen Supermodules with the new motherboards are ready for integration. Construction of the first EE Dee from the series production has started.

Lowering of the CMS detector elements to the UXC55 experimental cavern is advancing well. The first phase of this lowering campaign has been completed on schedule, and includes the YB0 central barrel yoke with the superconducting coil. Reviews for the YB0 services have been held and work has started. The piping design has been greatly simplified and the resource-loaded schedule indicates that sufficient manpower is available to complete the services on time. However, it is imperative for CMS to continue monitoring all supply-line schedules, such as those for the Muon System cables.

The referees reported on the status of the High Level Trigger (HLT). Activity in this area has increased markedly. The group has been strengthened. New algorithms and trigger paths that can run in the actual HLT conditions have been developed. The LHCC considers that in order to make further progress, more attention is needed in the organization of tasks taking into account a more global strategy, especially in composing a good trigger menu, finalising porting of the code to the new software framework and developing a list of objectives and metrics to set priorities. Plans for the Computing, Software and Analysis 2007 (CSA07) Challenge are being prepared.

The referees reported on the CMS schedule. Progress since the previous meeting of the LHCC in January 2007 has been outstanding and as a result CMS was able to hold the schedule since then. CMS has developed a contingency plan to identify critical path tasks which could be curtailed and postponed to the 2007-2008 shutdown period. The schedule to complete the initial CMS detector for the LHC run later in 2007 remains very tight but credible.

5. REPORT FROM THE LHCb REFEREES

The LHCC heard a report from the LHCb referees, concentrating on the LHCb detector construction, installation and commissioning.

Good progress was reported on the construction, installation and commissioning of the LHCb sub-detectors. Production of the Vertex Locators (VELO) modules, Inner Tracker (IT) and Trigger Tracker (TT) ladders, Hybrid Pixel Detectors (HPDs) for the Ring Image Cherenkov (RICH) detectors and chambers for the Muon System are either complete or approaching completion. Installation of the detector infrastructure and services, such as the long-distance cabling is essentially complete. Installation of sub-detectors is progressing well. The installation of the VELO, RICH-1 and Muon System detectors is proceeding well, the mechanical C-frame supports for the Outer Tracker are nearly all in place and the installation of the experimental beam pipe is well-advanced. Commissioning of the LHCb experiment has also started with work on the L0 Trigger and Calorimeter. Commissioning of the RICH-2 and the Online System will follow soon. The large number of tasks being undertaken in the UX85 LHCb experiment cavern is made possible through the excellent co-ordination structure put in place for work in the tight space available. The studies on understanding and mitigating the ageing effects observed in the Outer Tracker modules from the mass production are continuing, but the source of the problem to ensure its long-term solution remains outstanding. The LHCC is confident that LHCb will be able to exploit usefully the first collisions during the LHC engineering run at the end of 2007.

6. REPORT FROM THE LCG REFEREES

The LHCC heard a report on the LCG, concentrating on the requirements from the experiments and the status of data storage elements.

The referees reported on the LCG requirements by the experiments. Commissioning of the LCG for the experiments is advancing well. Some delays have been noted in the deployment of the World-wide LCG (WLCG), most notably in the area of Storage Resource Manager SRMv2.2. The experiments have also developed re-scaled computing models, adapting to the projected LHC luminosity with time. In particular, ATLAS, CMS and LHCb have pledged resources that are essentially in line with their requirements. However, care must be taken to ensure that the resources that actually become available are indeed what have been requested. The pledged resources for ALICE at present are less than what are required and discussions are underway to address this deficit. A so-called Megatable, which provides the inter-relationship and bandwidth between Tier centres is evolving. The transfer rate between Tier centres is improving but it still needs to be stabilised.

The LHCC also heard a report on the status of the data storage elements. The Committee noted a considerable improvement in this area since the beginning of this year, but more work is needed to fully complete their deployment at the LHC. It presently remains unclear whether the Dress Rehearsal scheduled for July 2007 will be able to use SRMv2.2 on either the dCache or CASTOR storage management services. The most critical issues concerning

CASTOR have been addressed successfully and now the service needs to be deployed and tested in a production environment.

7. REPORT FROM THE MOEDAL REFEREE

The Committee heard a report from the MOEDAL referee, concentrating on developments towards the final design of the MOEDAL experiment and towards the MOEDAL Technical Proposal. The design of the MOEDAL experimental set-up has evolved from the configuration in 2006 and contacts have been strengthened further with the LHCb Vertex Locator (VELO) group concerning integration of the MOEDAL detector around the VELO. The new MOEDAL set-up consists of deploying detectors on the walls and ceilings of the VELO cavern. This solution has the advantage of removing concerns regarding the heat build-up on the VELO, the lengthy access to the VELO detector and electronics and the suspension of the MOEDAL detector over the VELO but at the expense of a reduced MOEDAL acceptance. The LHCC encourages the MOEDAL Collaboration to continue with the design of their experimental set-up with a view of submitting the Technical Proposal by the end of 2007, one year later than originally planned.

8. TEST BEAMS

The SPS and PS Coordinator gave an overview of the users schedule at the PS and SPS for 2007 and reported on the future of the Gamma Irradiation Facility (GIF).

The Co-ordinator reported on the PS and SPS fixed target programmes. The PS and SPS fixed target programmes have been submitted to the users. Some beam time remains available for new requests at both facilities. The Co-ordinator reported that the repair of the septum magnet MNP23 at the PS East Hall will not be possible for the 2007 run and a solution based on using a dipole magnet will be introduced. The implication of this is that a new operation scheme will be used at the East Hall whereby the beam will be shared between three users – T7, T9-T10 and T8. Although less beam will be available per day, given daily scheduling it will nevertheless be possible to fulfill all needs of the users.

The Co-ordinator also reported on the GIF. The facility will continue to run in 2007 and in 2008 with several users in its current configuration and with support from CERN being guaranteed. An upgraded facility beyond 2008 is being discussed and a small working group, which includes representatives from the LHC experiments, is considering various options.

9. ALICE COMPREHENSIVE REVIEW

The seventh of the LHCC Comprehensive Reviews of ALICE took place on 19-20 March 2007. The LHCC referees addressed the following systems and areas: Inner Tracking System and Time Projection Chamber, Particle Identification and Dimuon Spectrometer, Forward Detectors and Calorimeters, Trigger, High-Level Trigger, DAQ, Controls and Offline, Installation and Commissioning, Strategy for Data-taking, Alignment and Calibration, First Physics, and the topics of Management, Technical Coordination, Integration, Schedules and Costs.

Since the sixth of the Comprehensive Reviews in March 2006, the ALICE Collaboration has made very significant progress towards the realisation of an experimental set-up ready to record proton-proton and heavy-ion collisions at the LHC. The LHCC considers it reasonable to expect ALICE to be ready with an initial working detector for the start of LHC operation in 2007, assuming that the timely delivery of sub-detectors and the smooth advancement of the production schedules remain ensured, and detector installation can be foreseen beyond this date.

Construction of final components for the initial detector configuration is approaching completion. Installation and commissioning of the ALICE detector and sub-systems is advancing well and reasonable plans are put in place for the data-taking, alignment and calibration as well as for the initial physics programme. The LHCC noted as a concern the late installation and the resulting tight schedule in the installation of the Miniframe, which carries

services without which commissioning of the sub-detectors cannot be completed, and in the delivery of the power supplies required for the ALICE commissioning. Compared to the schedule at the Comprehensive Review last year, the current status is five months later than planned but the delay of the LHC schedule by four months has meant the rest of the installation is still feasible, although it remains very tight.

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.

- Excellent progress has been reported on the Inner Tracking System (ITS). The Silicon Drift Detector (SDD) and Silicon Strip Detector (SSD) are integrated in the ITS and the Silicon Pad Detector (SPD) integration is to follow soon. The late connection of services means that the final testing of the ITS can only be done very late, leaving no possibility of repair for any serious problem that might be found. The Time Projection Chamber (TPC) installation and commissioning is under control. The chambers are in excellent condition as shown by test results using various methods.
- All particle identification detectors of ALICE have made very good progress since the last Comprehensive Review. Installation of the High Momentum Particle Identification Detector (HMPID) is almost complete and commissioning will start after Easter 2007. One Transition Radiation Detector (TRD) Supermodule (SM) has been installed already in 2006 and it is planned to install two more SMs before the 0.9 TeV LHC run in 2007. The schedule for this is very tight. During installation of the first two SMs of the Time-of-Flight (TOF) detector inside the L3 magnet some mechanical redesign of the support rails became necessary. The present schedule foresees installation of five further TOF SMs before closing the L3 magnet in summer 2007. Installation of the tracking and trigger chambers of the Dimuon Spectrometer have started and commissioning is ongoing in parallel. Production of electronics is proceeding well. In summary, the LHCC identified no major concerns in the areas of the particle identification and the Dimuon Spectrometer.
- Realisation of the ALICE Forward Detectors - V0, T0, Forward Multiplicity Detector (FMD), Photon Multiplicity Detector (PMD) and the Zero Degree Calorimeters (ZDCs) - is advancing well and the hardware construction is on track. In the case of the PMD, not all electronics may be ready for the LHC engineering run in 2007, but this will not have a lasting impact. The Photon Spectrometer (PHOS) group is ready to install one module, and the funding is now secure for a further two modules to be ready for the 2008 run. The Electromagnetic Calorimeter (EMCAL) support structure is ready but is delayed in shipping. The latter is not yet a concern but the structure's delivery to CERN cannot be delayed by more than six weeks from now.
- Deployment, integration and pre-commissioning of the Trigger, High-Level Trigger, DAQ and Controls systems are progressing well. The integration process has gained considerable momentum over the last months, though due to the complexity of the experiment, the time scale is nevertheless tight. In the offline sector, sizeable efforts are ongoing to prepare the software for real data, which need stronger support from sub-detector and physics groups. While the balance of pledged computing resources within the World-wide LHC Computing Grid (WLCG) has improved, there are still shortfalls expected in 2008 and beyond.
- Good progress was reported on the installation and commissioning of the ALICE detector. The LHCC noted the late installation of the Miniframe, which carries services without which commissioning of the sub-detectors cannot be completed, the availability of power supplies and the integration of the experimental control system with the sub-detectors. In order to make most of a cosmic-ray run, the LHCC recommends that ALICE clarifies the aims of such a run and subsequently appoints a run manager for this period.
- The LHCC considers that the strategy for data-taking, alignment and calibration presented by ALICE is reasonable and no major issues were identified.
- The LHCC reviewed the ALICE physics programme for the 0.9 and 14 TeV proton-proton runs, and for a PbPb pilot run. The proton-proton programme has the right degree of realism and ambition, with measurements of inclusive properties of the final

states apt for a tuning of Monte Carlo tools, as well as studies of the dynamics of very high multiplicity final states and of possible benchmarks for PbPb observables. A few days of low-luminosity PbPb data taking will provide a very valuable sample of events, with which to start the core programme of ALICE by determining global event properties and measuring the first hard-probe observables.

- The LHCC took note that several new institutes have recently joined or are about to join the ALICE Collaboration, bringing with them valuable resources and expertise. Good progress was reported on securing funding for the Electromagnetic Calorimeter (EMCAL), the Photon Spectrometer (PHOS) and for the Transition Radiation Detector (TRD). The Collaboration continues to adopt measures to control increases in the cost-to-completion.

10. REFEREES

Following changes to the LHCC membership, the new referee teams are as follows:

ALICE: P. Dauncey, M. Gonin, J. Haba (Co-ordinator)

ATLAS: F. Forti, V. Kekelidze (Co-ordinator), M. Martinez-Perez, P. Mato

CMS: S. de Jong, R. Mankel, S. Smith (Co-ordinator), R. Yoshida

LHCb: S. Dalla Torre, C. Niebuhr, B. Peyaud (Co-ordinator)

TOTEM: S. Dalla Torre

MOEDAL: B. Peyaud

LHCf: M. Mangano, C. Niebuhr

RD39: S. de Jong

RD42: V. Kekelidze

RD50: R. Yoshida

LCG: P. Dauncey, F. Forti (Co-ordinator), R. Mankel, M. Martinez-Perez

11. DATES FOR LHCC MEETINGS

Provisional Dates for **2007**:

9 – 10 May

4 – 5 July

26 – 27 September

21 – 22 November

12. The LHCC received the following documents:

Early TOTEM Running with the 90m Optics
LHCC-2007-013-G-130

CMS Expression of Interest in the SLHC
LHCC-2007-014/G-131

CMS Physics: Technical Design Report v. 2:
Addendum on High Density QCD with Heavy Ions
LHCC-2007-009/TDR-8.2-add.1

LHCb Comprehensive Review Report, 7 February 2007*
LHCC-2007-007/G-126

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*restricted circulation

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LARGE HADRON COLLIDER COMMITTEE

Minutes of the eighty-eighth meeting held on
Wednesday and Thursday, 9 May 2007

OPEN SESSION:

4. CMS Status Report: Tejinder Virdee
5. CMS Physics Technical Design Report Addendum 1 –
High Density QCD with Heavy Ions: David d'Enterria
6. LHCf Status Report: Oscar Adriani

CLOSED SESSION:

Present: S. Bertolucci (Chairman), J.-J. Blaising, S. Dalla Torre, J. Engelen, M. Ferro-Luzzi, M. Gonin, V. Kekelidze, J. Knobloch, M. Mangano, R. Mankel, M. Martinez-Perez, P. Mato, C. Niebuhr, B. Peyaud, C. Rembser, S. Smith, E. Tsismelis (Secretary), R. Yoshida

Apologies : P. Dauncey, S. de Jong, F. Forti, J. Haba

1. PROCEDURE

The minutes of the eighty-seventh LHCC meeting (LHCC 2007-015 / LHCC 87) and the report from the ALICE Comprehensive Review (LHCC 2007-016 / LHCC-G-132) were approved.

2. REPORT FROM THE CHIEF SCIENTIFIC OFFICER

The Chief Scientific Officer (CSO) reported on the status of the LHC machine installation and commissioning.

The repair of the Inner Triplet heat exchangers has been completed successfully. However, on 27 March, the structural supports to one quadrupole magnet of the Inner Triplet in Sector 4-5 failed a high pressure test in the LHC tunnel. To fix the structural supports' design flaw, a team of scientists and engineers has proposed to add to each Q1 magnet and to each Q3 magnet a set of four cartridges that can absorb the longitudinal force generated during the pressure test. The solution was presented to a review held at CERN on April 24 and 25. Since then the design of the cartridge system has been refined and parts needed for the cartridges and their installation have been ordered. Detailed tests of the design are in progress. The final design reviews will take place at Fermilab and CERN over the next weeks.

The delays caused by the Inner Triplets would not allow the LHC Engineering Run to go ahead later this year. Instead, the reduced objective of an Injection Test into the LHC should now be considered. The clear priority for the LHC Project remains to commission the machine to 7 TeV top energy in 2008. The revised LHC schedule along the lines described above will be presented to the LHC experiments and to the next session of Council.

Discussions on the White Paper are continuing and more information is expected in time for the next Council.

3. REPORT FROM THE ALICE REFEREES

The LHCC heard a report from the ALICE referees, concentrating on progress in the experiment since the Comprehensive Review in March 2007.

The referees reported on the failure of the Gigabit Optical Link (GOL) on the Multi-Chip Module (MCM) in several Half-Staves (HS) of the Silicon Pixel Detector (SPD) just prior to the termination of the half-barrel test in March 2007. Even after detailed diagnostic tests, the cause of the GOL malfunction has not yet been fully understood. Following an internal review, ALICE took the decision to replace the damaged HS, accepting in the process the associated risks and delays in the SPD installation schedule. However, installing the SPD with the failed HS would have resulted in an unacceptable loss of performance of the detector. The repair of the HS is now well-underway and the revised date for the start of installation of the SPD in ALICE is set for 18 June 2007, which is a delay of seven weeks.

The Committee heard a report on the general ALICE detector installation. The experimental beam pipe, the T0-C timing detector, the V0-C, and the Forward Multiplicity Detector FMD-3 have been installed according to plan. The 7-week delay to the SPD installation has resulted in the entire ALICE installation sequence up to the installation of the Miniframe, which carries the detector services without which commissioning of the ALICE sub-detectors cannot be completed, being also delayed. In order to recover some of the delay, the Time-of-Flight (TOF) and Transition Radiation Detector (TRD) installation procedures have been changed in order to allow installation of the TOF and TRD with the Miniframe in place. In conclusion, the overall result of the SPD incident is a delay of three weeks to the closure of the LHC vacuum through ALICE.

The Committee took note of the list of LHCC milestones due at the end of May 2007 and of the overall ALICE schedule. The LHCC considers that it is reasonable to expect ALICE to be ready with the initial working detector for the start of LHC operation assuming that the sub-detector production and delivery schedules are maintained and the commissioning of the experiment proceeds as planned.

4. REPORT FROM THE ATLAS REFEREES

The LHCC heard a report from the ATLAS referees, concentrating on the general status, installation of the Inner Detector, and update of the power supply status and a report on the combined running and commissioning.

The referees reported on the general status of the ATLAS experiment. Integration and installation of the Muon System (Barrel and Big Wheels) and of the Trigger and DAQ are progressing well. The End-cap Toroid magnets are being prepared for transport to Point 1 according to schedule. The LAr Calorimeters are fully connected and are being cooled. Good progress was reported on the computing and software with the plan for 2007, including the Full Dress Rehearsal in June-October, being reasonable. Installation of the Muon Small Wheels remains very critical.

The Committee heard a report on the Inner Detector. Significant progress has been made on the repair of the heaters of the evaporative cooling system. A well-prepared plan of testing and installation was reported with the aim to minimize the affect of the overall ATLAS schedule. However, at the time of the LHCC meeting, a repaired heater failed and this is currently being analysed by ATLAS. The LHCC considers that the most critical item on the ATLAS schedule is the installation of the Inner Detector and the Committee will keep monitoring progress in this area.

The referees reported on the power supplies. The repair of the low voltage power supplies for the Tile Calorimeter is advancing smoothly and according to schedule. Some concerns remain with the failure of the bulk 200 V power supply and is currently being re-worked. The programme of retro-fitting the low voltage supplies of the LAr Calorimeters has started successfully and the rate of repair is being increased. Back-up solutions, needed in case of further difficulties with the baseline ALGEN solution, are being analysed. The total quantity of CAEN power supplies for the Muon System is satisfactory, although exact allocation

between sub-detector types is not as expected. This is being rectified. The overall delay of the power supplies still creates problems for the commissioning of the detectors concerned. The referees reported on the Letter of Intent for Zero Degree Calorimeters (ZDCs) for ATLAS. ATLAS proposes to build compact calorimeters that are to be located at approximately zero degrees to the incident LHC beams on either side of the ATLAS interaction point (IP), 140 m. from the IP. The aim is to observe forward-going neutral particles that are produced in heavy-ion, proton-nucleus and proton-proton collisions. The LHCC took note of the Letter of Intent and encourages the ATLAS Collaboration to continue the development of the ZDCs.

The LHCC took note of the on-going work regarding the ATLAS commissioning and preparations for LHC running. The Committee considers that the aims are well-defined and are proceeding in time for the first LHC physics run. The overall objectives include the integration of detectors and central systems as they become available, followed by the testing of various operational modes. This is followed by cosmic runs allowing for detector studies with particles and the transfer of data to the Tier-0 centre. The cosmic runs also provide an important element in the training of the collaboration members in the operation aspects of the ATLAS experiment.

The Committee also took note of the ATLAS Maintenance and Operation scheme and the planning for the operation task sharing. The operation of the ATLAS experiment, spanning from the detector operation to computing and data preparation, requires a significant effort across the full Collaboration.

The referees also reported on the ATLAS activities concerning the upgrade of the experiment in view of a possible upgrade to the LHC luminosity (SLHC). A number of ATLAS R&D proposals regarding the upgrade were presented and are being organized through an organizational structure put in place to oversee the ATLAS upgrade.

5. REPORT FROM THE CMS REFEREES

The LHCC heard a report from the CMS referees, concentrating on the status of the experiment and the general schedule.

The referees reported on the status of sub-detectors. Good progress was reported on the commissioning of the Tracker at the Tracker Integration Facility (TIF). Most of the goals for the warm operation at the TIF have been met while the aims for the cold operation have been developed and are reasonable. Good progress was also reported on the beam and radiation monitoring systems and the status and plans of the CMS luminosity group are reasonable.

The LHCC heard a report on the installation of the CMS experiment. Installation of the experiment is progressing smoothly and the enhanced CMS Technical Co-ordination and YB0 Task Force are contributing to the success. Installation of Barrel Electromagnetic Calorimeter (EB) Supermodule is well underway, and the installation of the YB0 services has started. The work is proceeding with a strong emphasis on safety and quality control and assurance.

The referees reported on the status of the Trigger, DAQ and software. Production of components for the Trigger is nearly complete and their installation and commissioning is proceeding with the aim of keeping pace with the detector commissioning schedule. The DAQ activities are advancing well and are on schedule for a global CMS cosmic run in November 2007. Excellent progress was reported on the High-Level Trigger (HLT). Significant improvements in speed were reported and preparations for the deployment in the DAQ chain at the CMS experimental area are in progress. The development of the offline software and preparations for the Computing, Software and Analysis 2007 (CSA07) Challenge are well-organised and are making excellent progress. The physics performance of the CMS detector, as described in the Physics Technical Design Report Vol. II, has been validated with the CMS offline software CMSSW. Clear priorities have been set for the first-year physics at the LHC, and include the search for the Higgs boson in the WW channel, low-mass inclusive SUSY searches and a very powerful programme of Standard Model physics studies.

The Committee took note of the general CMS schedule. The installation of the EB is scheduled to be complete in June 2007 and the Tracker in August 2007. CMS will be ready to close in October 2007 and the CMS systems, except for the End-cap Electromagnetic Calorimeter (EE) and the Pixel Detector, are expected to be in place for global data-taking in November 2007. A CMS cosmic run in November 2007 is maintained in order to perform a global commissioning and test of the experiment and to maintain momentum and focus. CMS is working on a revised schedule to take into account the revised LHC machine schedule. The next Comprehensive Review for CMS is scheduled for 2-3 July 2007.

6. CMS EXPRESSION OF INTEREST IN THE SLHC

The LHCC heard a report describing the motivation and scope of the likely upgrades needed to the CMS experiment for the Super LHC (SLHC) – the upgrade to the LHC machine in order to increase the delivered luminosity by about an order of magnitude from its nominal design luminosity. The CMS upgrade plans are driven largely by the Tracker requirements, including the need for higher granularity, the potential need for a significantly larger Pixel Detector, the reduction of detector material, and the development of methods to form tracks with the Tracker at 40 MHz and 20 MHz as input into the Level-1 Trigger. Moreover, the CMS Trigger would need to be replaced. The level of R&D required is considered to be substantial and it is timely already now to begin focused development on the detectors required for the SLHC. Interaction with existing R&D projects needs to be strengthened. The LHCC took note of the CMS Expression of Interest in the SLHC and encourages the CMS Collaboration of developing avenues of R&D with a view of submitting a more detailed Letter of Intent. The LHCC will review developments in the proposed CMS R&D activities in the future.

7. REPORT FROM THE LHCb REFEREES

The Committee heard a report from the LHCb referees, concentrating on the status of the detector construction, installation and commissioning.

Good progress was reported on the detector construction. Production of the Muon Chambers, Trigger Tracker (TT) ladders, Vertex Locator (VELO) modules and Hybrid Pixel Detectors (HPDs) is complete, while production of the Inner Tracker (IT) modules is approaching completion.

The referees also reported on the status of the experiment installation. The installation of the infrastructure and general services, including the long-distance cabling, is essentially complete. The experimental beam pipe is in place and the clean gas injection system is being installed. Bake-out and commissioning of the beam pipe is in progress. Installation of detector components is advancing well. Installation and testing of Muon Stations M2-M5 is in progress while that for Station M1 will start in June 2007. Installation of the VELO and Ring Image Cherenkov (RICH-1) is scheduled for immediately after the bake-out of the experimental beam pipe in June 2007. All C-frames of the Outer Tracker have been installed and a prototype heating device for *in situ* heating of the Outer Tracker is undergoing tests at Heidelberg. Installation of the Online System is also advancing well.

Commissioning of various systems has started. A complete slice of the Hadronic Calorimeter (HCAL) and RICH-2 is controlled and commissioned from the LHCb experimental control room. Preparations for commissioning the Outer Tracker are in progress.

8. REPORT FROM THE TOTEM REFEREE

The LHCC heard a report from the TOTEM referee, concentrating on the general status of the experiment and on the proposal for early TOTEM running with the 90 m. optics.

Good progress was reported on the construction of the TOTEM detector. Mass production of the Cathode Strip Chamber (CSC) for the T1 Telescope has started and is expected to be completed by the end of 2007 and all the mechanical supports have been fabricated.

Production of the T2 Telescope Gas Electron Multiplier (GEM) detectors is advancing well and are scheduled to be completed by June 2007. All eight Roman Pots have been assembled.

Testing has started and the first Roman Pots have been delivered to the LHC vacuum group for installation. Good progress was also reported on the detectors, with all cables now in place and the first prototype detector being tested successfully with source using the VFAT front-end electronics. Extensive tests on the evaporative cooling system have been completed successfully. The LHCC took note of the TOTEM plans for beam tests at the SPS in 2007. The beam tests are considered essential in order to validate, improve and consolidate the electronics and DAQ. During 2007, TOTEM plans to install the T1 and T2 Telescopes once the CMS forward detectors are in place and also plan to have all eight Roman Pots together with their services installed but initially not with the complete set of sensors. The LHCC took note of the proposal for early TOTEM running with the $\beta^*=90$ m. optics. The Committee considers that TOTEM running during the early stages of LHC operation offers the opportunity to commission the TOTEM experiment and to provide first measurements of the σ_{tot} and machine parameters, assuming good and stable conditions on both the TOTEM and LHC Machine sides and a good control of the instrumental uncertainties of the TOTEM detectors. The 'un-squeeze' from the standard injection and ramp optics of $\beta^*=11$ m. to the $\beta^*=90$ m. TOTEM optics appears feasible but needs to be verified during early LHC operation or during a machine development. The time needed to commission the $\beta^*=90$ m. optics is difficult to predict but is expected to be similar to that needed to commission the squeeze down to $\beta^*=2$ m. from $\beta^*=11$ m.

9. REPORT FROM THE LHCf REFEREES

The Committee heard a report from the LHCf referees. Since the previous review in 2006, the LHCf Collaboration has made very significant progress towards the realization of an experimental set-up ready for first collisions at the LHC. The LHCC considers it reasonable to expect LHCf to be ready for the start of LHC operation. All milestones have been successfully met, including the beam tests at the SPS, the installation of the infrastructure and general services, the completion of the construction of both calorimeters and the pre-installation tests in the LHC tunnel. The dates for the final installation of the calorimeters are being reviewed with the LHC machine groups.

10. REPORT FROM THE LCG REFEREES

The LHCC heard a report from the LCG referees, concentrating on the ramp-up and operation of the World-wide LCG (WLCG), the status of the services and the CMS Computing, Software and Analysis 2007 (CSA07) Challenge. Ramping-up of WLCG resources is in progress and the installed resources are now close to those pledged in the Memorandum of Understanding. Site reliability has improved and the plan is to further increase the target. Monitoring and accounting of job reliability are making good progress. The WLCG milestones are being met essentially as scheduled. A gradual transition from the Service Challenges to experiment LCG operations is being made and the services are being improved in order to address the needs of the experiments. The support of Storage Resource Manager 2.2 (SRM 2.2) by the mass storage systems is converging but the risk is that SRM 2.2 will come too late for the Dress Rehearsals in July 2007. The CMS CSA07 Challenge is a good example of an ambitious experiment challenge at the 50% of the expected data rates in 2008.

11. REPORT FROM THE RD42 REFEREE

The LHCC heard a report from the RD42 referee on the collaboration's programme concerning the development of intrinsically radiation-hard Chemical Vapour Deposition (CVD) diamond devices.

Good progress was reported for the past year. New polycrystalline CVD (pCVD) material has become available in the form of wafers of large size and with good operation characteristics and good quality single-crystal (scCVD) has become available with sizes useable for detector construction. In collaboration with ATLAS and CMS, RD42 has constructed single-chip and multi-chip pixel modules based on CVD wafers using the final ATLAS 0.25 μm radiation-

hard electronics. This pixel detector technology is developing with a view for application in future tracking detectors. Application of CVD-based detectors in BaBar and CDF has been successful and the CVD Beam Condition Monitor (BCM) has been installed in ATLAS. The Committee also took note of the continuing studies on radiation hardness of CVD. The LHCC considers that the proposed research programme for 2007, concentrating on the radiation hardness of diamond trackers and pixel detectors, the construction of two additional pixel detector modules, beam tests with diamond trackers and pixel detectors and the continuing characterisation of diamond samples, to be reasonable. In view of the above and given the modest request for resources for further work, the referee recommends that the R&D project be continued in 2007. A status report is expected to be submitted to the LHCC in one year's time. The Committee **agrees** to the continuation of the project on this basis.

12. REFEREES

Following changes to the LHCC membership, the new referee teams are as follows:

ALICE: P. Dauncey, M. Gonin, J. Haba (Co-ordinator)

ATLAS: F. Forti, V. Kekelidze (Co-ordinator), M. Martinez-Perez, P. Mato

CMS: S. de Jong, R. Mankel, S. Smith (Co-ordinator), R. Yoshida

LHCb: S. Dalla Torre, C. Niebuhr, B. Peyaud (Co-ordinator)

TOTEM: S. Dalla Torre

MOEDAL: B. Peyaud

LHCf: M. Mangano, C. Niebuhr

RD39: S. de Jong

RD42: V. Kekelidze

RD50: R. Yoshida

LCG: P. Dauncey, F. Forti (Co-ordinator), R. Mankel, M. Martinez-Perez

13. The LHCC received the following documents:

CMS Expression of Interest in the SLHC - LHCC-2007-014/G-131
CMS Physics: Technical Design Report v. 2: Addendum on High Density QCD with Heavy Ions - LHCC-2007-009/TDR-8.2-Add.1

ALICE Comprehensive Review Report, 7 February 2007* 22 March 2007
LHCC-2007-016/G-132

Minutes of the eighty-seventh LHCC meeting held on Wednesday and Thursday, 21– 22 March 2007 - CERN/LHCC 2007-015/LHCC 87

14. DATES FOR LHCC MEETINGS

Provisional Dates for **2007**:

4 – 5 July

26 – 27 September

21 – 22 November

*restricted circulation

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DRAFT MINUTES of the 81st Meeting of the SPSC
Held on Tuesday and Wednesday 17th and 18th April 2007

OPEN SESSION:

- | | |
|--|-------------------------|
| 1. Status Report of DIRAC | L. Nemenov, L. Tauscher |
| 2. Status Report of CLOUD | J. Kirkby |
| 3. Status Report of CAST, and proposal for extension | B. Lacic |

CLOSED SESSION

Present:

S. Baird (part time), J.J. Blaising, B. Bloch-Devaux, T. Carli, J.B. Dainton (Chair), J-P. Delahaye (part time), M. Doser, J. Engelen (part time), M. Erdmann, A. Ereditato, L. Gatignon, L. Kluberg, J. Knobloch, M. Mannelli (Secretary), P. Marage, C. Rembser, G. Ridolfi, U. Wiedemann

Invited for the presentation of the COMPASS hadron physics program:

A. Magnon, G. Mallot, S. Paul

Apologies: H. Abramowicz, P. Kooijman, P. Newman, P. Schleper, U. Klein. J.F. Verdu, D. Wark

1. MINUTES OF THE 80th MEETING OF THE SPSC, HELD ON
FEBRUARY 6th and 7th, 2007

The Minutes were approved with minor comments.

2. REPORT FROM THE CHAIRMAN

The chair reported back from the last Research Board meeting, RB179. The following points were presented to RB179:

- i) appreciation by the SPSC of the shutdown work on CERN accelerator and beam delivery systems,
- ii) the strong support of the SPSC for the continuation of the AD physics programme in 2007 and in years to come,
- iii) the strong support of the SPSC for the completion of the COMPASS muon programme (both longitudinally polarised, hydrogen target, data-taking and transversity measurements), which, if North area beam delivery goes well, should be possible in 2007,

- iv) the continuing request by the SPSC for clarification by the COMPASS collaboration on the contemporary impact of the approved hadron programme,
- v) the recommendation by the SPSC for the approval of the NA49_future (now NA6?) pC pilot data taking,
- vi) progress in the detailed consideration by the SPSC of the substantial NA49_future (now NA6?) physics programme involving hadron measurements for ν physics and for cosmic ray physics, and a programme for the next stages in fixed-target heavy ion physics at CERN in forthcoming years,
- vii) progress in the detailed consideration by the SPSC of the proposal for QED tests by means of magnetic birefringence of the vacuum (OSQAR), with new sensitivity for the discovery of axions, and the possibility to perform a photon regeneration test at CERN to examine a recent, interesting, result (PVLAS),
- viii) the strong opinion of the SPSC that final commissioning of the CNGS beam following first operational experience in 2006 is vital before high intensity delivery of neutrinos to LNGS begins,
- ix) the concern of the SPSC that the OPERA target mass will not be complete until at the earliest the beginning of 2008,
- x) the recommendation by the SPSC for approval of the measurement by the P326 R&D programme of the K -decay ratio $R_{K=K \rightarrow e \nu / \mu \nu}$,
- xi) the strong support by the SPSC for the continuation in 2007 of the approved P326 R&D work,
- xii) the recommendation by the SPSC for the approval of test beam work by the CALICE (ILC calorimetry) and RD22 groups in 2007, and
- xiii) the policy of the SPSC to give a final opinion on the specific nature of data-taking in 2007 only after a satisfactory outcome of on-going discussions concerning the impact of the COMPASS hadron programme (iv above), and on a better assessment, based on further reported experience, of the schedule for the completion of the OPERA target brick assembly.

The Research Board noted all but v), x), xii) and xiii) above, confirmed the recommendations in v), x) and xii), and endorsed the policy in xiii).

3. STATUS OF ACCELERATORS

S. Baird reported on the status of the Accelerators, in preparation for operations in 2007.

The full program of maintenance of consolidation for the Accelerator Complex is mostly completed as planned.

The recently discovered water infiltration in the TT2 line requires larger than expected civil engineering work to repair it.

The PSB received beam from LINAC2 as scheduled, on April 10th. First beam was delivered to the PS from April 13th and initial set up for ISOLDE is scheduled to start of April 16th. The AD is scheduled to start with beam on the 7th of May.

The SPSC expresses its appreciation for the successful completion of the repair and consolidation activity scheduled for this 2006 – 2007 shutdown, and the readiness to start-up the accelerator complex on schedule.

As previously reported, the AD has suffered from poor reliability, due to the lack of consolidation funds.

The SPSC notes with satisfaction that some funding is now explicitly set aside for regular consolidation of the AD complex, in view of improving the reliability of its operation until at least 2010.

4. STATUS OF EXPERIMENTAL AREAS

L. Gagnon reported on the status of the East, North, CNGS and AD Experimental Areas.

EAST AREA

Installation of the MCB magnet, to replace the broken MNP23 magnets servicing the South Branch of EAST AREA has been completed as scheduled. The new vacuum chamber was installed on April 2nd, and the magnet is ready to receive beam as planned.

A number of magnet repairs have been carried out in the EAST AREA, including some due to water leaks detected during as magnets were being switched back on in view of this year's start-up.

The EAST AREA will be ready for operation as scheduled, with some operational restrictions, namely that simultaneous North and South Branch cycles are no longer possible, due to the replacement of the failed MNP23 magnet with the MCB magnet mentioned above.

The SPSC appreciates the successful effort to ensure efficient operation of both the North and South Branches of the East Area, following the repeated magnet failures that cut short the DIRAC run in 2006. This should now ensure timely and reliable availability of beam for DIRAC in 2007.

It was pointed out, that the very large number of different magnet types in the EAST AREA complicates maintenance. Studies for the reorganization of the EAST AREA to provide for easier maintenance are ongoing.

A new layout of the T11 zone for the CLOUD experiment has been agreed.

In view of the changes to the CLOUD schedule, relocation of the CLOUD apparatus will be considered in the broader context of the ongoing studies for the reorganization of the EAST AREA for easier maintenance.

NORTH AREA

Preparations for the 2007 operation of the NORTH AREA continue as planned.

These include work for P326, the 2007 NA49 run, and COMPASS, including some preparatory work in anticipation of COMPASS running with hadron beams, as well as the large number of detailed modifications to accommodate the various requests for beam in 2007.

CNGS

As previously reported, a number of details in the cooling systems of the CNGS Reflector drain connections, as well as in the water inlet bellows in both the Reflector and the Horn, are being implemented in order to ensure the long term reliability of the CNGS beam line.

A detailed schedule for the full program of improvements, installation and tests exists, which aims to have the CNGS facility ready to start the final commissioning at nominal intensity by mid-September.

AD

A major modification has been made to the main power supplies, replacing active filters with passive ones, which should simplify both operations and maintenance.

It has been decided to start the hardware tests for AD one week early, increasing from four to five weeks the testing period, in order to provide additional time to test the modified power supplies.

Four weeks are allocated to setting up with beam, considerably longer than last year, with the aim of ensuring efficient physics operations.

5. PS AND SPS SCHEDULES

C. Rembser presented the detailed Accelerator Schedule for 2007.

A feasibility study is underway for extending PS operation for DIRAC beyond November, during the operation of the accelerator complex as injector for the LHC, in order to ensure completion of the proposed physics program by the end of 2008.

The SPSC supports plans to include a high intensity CNGS commissioning run, once repairs to water-cooling circuits are completed.

The SPSC also supports the proposed modification of the time-sharing among the AD experiments, moving from 8 hour to 12-hour shifts, which will allow more efficient operation of the AD program.

6. DISCUSSION OF THE OPEN SESSION

6.1 DIRAC

The SPSC congratulates the DIRAC collaboration on the progress towards completing the upgraded apparatus.

In the light of the aborted run 2006, it is particularly important for DIRAC to take substantial data in 2007.

On the basis of the 2007 run, **the SPSC looks forward** to better understanding the prospects and schedule for completing the proposed physics program.

6.2 CLOUD

The SPSC congratulates the CLOUD collaboration on successful tests in 2006, during which a number of different measurement techniques, critical to the viability of the experiment, were integrated and operated together.

The SPSC now looks forward to further analysis of beam-induced effects in the prototype CLOUD chamber.

Finally, **the SPSC takes note** of the plans for a second prototype CLOUD chamber to continue developing the design of the final apparatus, and the request to postpone next running period until 2008.

6.3 CAST

The SPSC congratulates the CAST collaboration on the excellent progress towards He3 operation in 2007.

The SPSC finds that the aims of the proposed program with He3 are well motivated and well worth pursuing, **and welcomes** the possibility to further extend the experiments sensitivity to lower energy axions.

However, in the light of the three-year extension requested to complete this program, **the SPSC looks forward** to a clarification of the availability of resources.

7. FOLLOW UP ON EXPERIMENTS AND PROPOSALS

7.1 CNGS1-OPERA

The SPSC notes with pleasure that brick production is now ongoing as a routine operation.

There is a plan for gradually increasing the currently established rate of 1,000 bricks per week to 3,000 bricks per week, in order to complete production and installation of the currently funded 150,000 bricks in time for the start-up of the 2008 run.

The SPSC will continue monitoring the progress of brick assembly with respect to the schedule presented.

7.2 COMPASS

In view of the good prospects for completing the remaining physics program with polarised muon beams in 2007, **the SPSC strongly recommends** that COMPASS focus on achieving this goal, before then concentrating their resources on the hadron program in 2008 and beyond.

The SPSC notes that preliminary results on the pion polarisability from the Primakoff effect, using data from the 2004 pilot run with hadrons, are now available, **and looks forward** to timely publication of these results.

The SPSC notes the progress in updating the potential impact and useful scope of the proposed program of glueball and hybrid spectroscopy, **and looks forward** to this being further developed.

7.3 P-331 Proposal for QED tests and search for Axions by optical techniques (CERN-SPSC-2006-035/P-331)

The SPSC **took note** of a recent measurement (PVLAS) of vacuum magnetic birefringence (VMB), where the observed signal is 4 orders of magnitude larger than expected in QED. The existence of a light, neutral, spin-zero, particle (axion) has been suggested as one possible explanation of this finding. The existence of such a particle could be checked in a photon regeneration experiment. On the other hand, alternative explanations have been advocated which may account for an anomalously large VMB in the absence of photon regeneration.

The SPSC **recognizes** a fundamental interest in obtaining an independent measurement of the VMB, and in performing the complementary photon regeneration measurement.

The SPSC appreciates the elegance of the methods presented in the full proposal P-331. This proposal aims at a measurement of both the VMB and photon regeneration, by exploiting the availability of spare LHC test magnets, which provide one of the largest optical path-lengths in a high magnetic field available world-wide.

The SPSC **recommends approval of the 2007 programme** of P-331, which aims at performing a photon regeneration experiment with a sensitivity largely sufficient to prove or disprove an axion-like interpretation of the recent VMB measurement PVLAS. The SPSC looks forward to a timely physics data analysis.

The SPSC recognizes that the physics case for the long term programme of P-331 is very strong, and it **strongly encourages** the OSQAR Collaboration to follow its proposed timeline towards preparation of all aspects of a competitive VMB experiment, and to report on its progress in due course.

7.4 HARP

The SPSC has received a copy of a report, commissioned by CERN and by the major funding agencies of HARP, into issues related to the analysis and publication of HARP data. Two members of the SPSC, T. Carli and J. Fuster, who are lead SPSC referees for HARP, were members of the committee which carried out the investigation of the status of the HARP data analysis, and which produced the report.

The SPSC wishes to put on record its thanks to the funding agencies for initiating the report and for supplying a copy to the SPSC for its consideration. The SPSC also wishes to express its thanks and appreciation to all members of the review committee for the substantial time and effort, which has so clearly been necessary for them to complete their valuable work.

After due consideration of submitted information, and after exhaustive discussion with members of the collaboration, the review committee concludes in its report that there is most likely a bias, due to distortions in HARP TPC data, in reconstructed momentum beyond the quoted systematic uncertainties in one of the two independent analyses of the “large angle data” currently underway.

The SPSC HARP referees also reported that, following the completion of the report by the HARP review committee and its submission to the funding agencies, those members of the HARP collaboration, whose analysis was considered to suffer from the momentum bias quoted above, now find themselves in disagreement with the conclusions of the report.

On the basis of the evidence which is considered by the review committee, and which is recorded in the report, **the SPSC agrees with the conclusions in the report. It therefore strongly recommends that the HARP collaboration takes advantage from the work of the review committee, recorded throughout the report in its findings, to progress as expeditiously as possible the analysis of all its data to a reliable conclusion, and thence to publication.** The SPSC will follow progress to this end, with the conclusions of the report in mind.

8. OTHER REQUESTS FOR BEAM IN 2007

The request by the SiILC group for 3 weeks test-beam run, which can be accommodated with no significant impact to other users, and minimal resources required of CERN, is supported by the SPSC.

9. AOB

10. DOCUMENTS RECEIVED

- Minutes of the 80th meeting, held on 6-7 February 2007; [CERN-SPSC-2007-010](#); [SPSC-080](#).

- Status Report of the CAST experiment and Request to run beyond 2007
[CERN-SPSC-2007-012/SR-018](#).

- Status Report of PS215/CLOUD; [CERN-SPSC-2007-014/ SR-019](#).

- The COMPASS Hadron Programme ; [CERN-SPSC-2007-015/M-755](#).