CERN RESEARCH BOARD

MINUTES OF THE 181st MEETING OF THE RESEARCH BOARD
HELD ON MONDAY 10 SEPTEMBER 2007

Present

Apologies
L. Evans

Items

1. Procedure
2. Report from the LHCC meeting of 4 July 2007
3. Report from the SPSC meeting of 26-27 June 2007
4. Report from the INTC meeting of 21-22 May 2007
5. Any other business
1. **PROCEDURE**

1.1 The minutes of the Research Board held on 7 June 2007 [1] were approved without modification. There were no matters arising.

2. **REPORT FROM THE LHCC MEETING OF 4 JULY 2007**

2.1 S. Bertolucci reported on the last LHCC meeting [2], including the status of ALICE, ATLAS, LHCb, TOTEM, the LCG, and a Comprehensive Review of CMS [3]. The Research Board took note.

2.2 As this was the last time that S. Bertolucci would attend the Research Board as Chairman of the LHCC, he was warmly thanked for his contributions by R. Aymar and J. Engelen.

3. **REPORT FROM THE SPSC MEETING OF 26-27 JUNE 2007**

3.1 J. Dainton reported on the last SPSC meeting [2], including the annual reviews of NA63, COMPASS, OPERA and ICARUS. The SPSC has requested further information from COMPASS concerning their physics goals for future running with a hadron beam. The Research Board took note, and waits for the SPSC recommendation on the COMPASS programme.

3.2 A commissioning run for three weeks is foreseen for CNGS this year. Given the expected rate of installation of the OPERA target bricks, the SPSC supports their request for an additional three weeks of CNGS operation in the latter part of 2007, and this was approved by the Research Board.

3.3 NA61 propose to run in 2008 with proton and pion beams on carbon targets, to make measurements relevant for the analysis of T2K and cosmic ray experiments, as well as proton-proton data as reference for high-$p_T$ suppression in heavy ion interactions [4]. In addition, they propose to study heavy ion collisions in 2009 and beyond, to further understand the critical point of strongly interacting matter. They propose to start this heavy ion programme with sulphur ions. The NA61 run in 2008 was approved by
the Research Board. However, heavy ion running for NA61 in subsequent years may only be possible if it is coherent with the programme of heavy ion physics at the LHC (i.e. same operational period, same ion species). In particular, it is expected that in 2009 only lead ions will be available. This will be investigated by S. Myers, who will report at the next Research Board meeting.

3.4 CAST is currently being upgraded to run with $^3\text{He}$ as a buffer gas, and requests to run for three more years (2008-2010) to fully exploit its axion discovery potential [5]. This was recommended by the SPSC for approval. However, the cost of upgrading the cryogenics control system is not currently foreseen in the PH department budget. The Research Board approved the continued running of CAST until 2010, but on the understanding that the collaboration should either look for alternative solutions to the funding of their control system upgrade, or accept the risk that the CAST run may terminate early in case of failure of the old system, if the control system is not upgraded.

3.5 The continuation of ACE (AD-4) for a further week of running in 2007 [6] was recommended for approval by the SPSC, and this was endorsed by the Research Board.

4. REPORT FROM THE INTC MEETING OF 21-22 MAY 2007

4.1 M. Huyse reported on the last INTC meeting, including an evaluation of the key resources for ISOLDE and a forecast for the coming years [2]. As this was the last meeting that L. Fraile would attend as ISOLDE Physics Coordinator, M. Huyse thanked him for his hard work. Seven ISOLDE proposals were recommended for approval this time, for a total of 94 shifts (out of 204 requested). They are listed in the following paragraphs.

4.2 P225 Measurement of ground state properties of neutron-rich nuclei on the $r$-process path between the $N=50$ and $N=82$ shells [7] was approved for 16 shifts, and will be known as IS458.

4.3 P227 Further Studies of neutron-deficient Sn-isotopes using REX-ISOLDE [8] was approved for 10 shifts, and will be known as IS459.
4.4 **P229** *Magnetic dipole moments of High-K isomeric states in Hf isotopes* [9] was **approved for 15 shifts**, and will be known as IS460.

4.5 **P230** *Investigation of the Proton-Neutron interaction by High-Precision nuclear mass measurements* [10] was **approved for 11 shifts**, and will be known as IS461.

4.6 **P231** *Off-Line Tests and First On-line Installation of the Laser Ion Source Trap LIST – Application for CVC Test and CKM Unitarity* [11] was **approved for 12 shifts**, and will be known as IS462.

4.7 **P232** *Decay studies and mass measurements on isobarically pure neutron-rich Hg and Tl isotopes* [12] was **approved for 22 shifts**, and will be known as IS463.

4.8 **P233** *(n,p) emission channeling measurements on ion-implanted beryllium* [13] was **approved for 8 shifts**, and will be known as IS464.

5. **ANY OTHER BUSINESS**

5.1 The dates of the Research Board meetings in 2008 were confirmed as 27 February, 4 June, 3 September and 26 November, starting at 9:00.

5.2 J.J. Blaising requested that the status of the CLIC Test Facility (CTF3) should be clarified for administrative purposes, such as appearing in the “Grey Book” database of research programmes at CERN. **The Research Board confirmed that CTF3 is an approved part of the CERN programme.**

5.3 The **next meeting** of the Research Board will be held on 28 November 2007, at 9:00.
ENCLOSURES

1. Minutes of the 89th LHCC meeting (LHCC-2007-022/LHCC-89)
2. Draft minutes of the 82nd SPSC meeting (SPSC-2007-025/SPSC-082)
3. Minutes of the 29th INTC meeting (INTC-2007-024/INTC-029)

REFERENCES

[2] Copies of the transparencies are available from the agenda at: http://indico.cern.ch/conferenceDisplay.py?confId=20040
[7] Measurement of ground state properties of neutron-rich nuclei on the r-process path between the N=50 and N=82 shells (INTC-2007-012/P-225)
[10] Investigation of the Proton-Neutron interaction by High-Precision nuclear mass measurements (INTC-2007-019/P-230)
[12] Decay studies and mass measurements on isobarically pure neutron-rich Hg and Tl isotopes (INTC-2007-022/P-232)
[13] (n,p) emission channelling measurements on ion-implanted beryllium (INTC-2007-023/P-233)
The Chief Scientific Officer (CSO) reported on the status of the LHC machine and on decisions taken at CERN Council in June 2007. Installation and commissioning of the LHC machine is progressing well. Sector 7-8 has now been cooled down to 1.9 K and powering tests on this sector have commenced. Although the cool-down took longer than expected, the process has allowed the expert teams to gain experience in operating the cryogenic systems and will apply this experience to the subsequent sectors to be cooled down.

As reported earlier, the minor delays accumulated in the final stages of LHC installation and commissioning and the failure of the Inner Triplet during the pressure test in Sector 4-5 in March 2007, would not allow the LHC Engineering Run to go ahead later this year. The clear priority remains for the LHC to start up with beam at 7 TeV top energy in May 2008. The revised LHC schedule along the lines described above has been presented to the LHC experiments and to CERN Council in June 2007.

In addition, CERN Council agreed to increase CERN’s funding for the years 2008-2011. This is an important step in implementing the decisions made by CERN Council in July 2006 as part of a European strategy for particle physics. The extra funding will allow CERN to consolidate the laboratory’s infrastructure, to prepare for future upgrades of the LHC and to re-launch a programme of R&D for the long term.

3. REPORT FROM THE ALICE REFEREES
The LHCC heard a report from the ALICE referees, concentrating on the status of the sub-systems and on the installation and commissioning of the experiment.

The referees reported on the status of Silicon Pixel Detector (SPD) repair following the failure of the Gigabit Optical Link (GOL) on the Multi-Chip Module (MCM) in several detector
Half-Staves (HS) in March 2007. The repair of the HS is finished and the installation of the SPD in ALICE was completed successfully in June 2007.

Installation and commissioning of the ALICE experiment is advancing well. All barrel tracking detectors – SPD, Silicon Strip Detector (SSD), Silicon Drift Detector (SDD) and the Time Projection Chamber (TPC) – are now installed on the beam line and the LHCC congratulates the ALICE Collaboration for meeting this milestone. Good progress was also reported on the installation of the High Multiplicity Particle Identification Detector (HMPID), the Muon Tracking and Trigger Chambers, the Time-of-Flight (TOF) detector, the Transition Radiation Detector (TRD), the T0 and V0 detectors, the Forward Multiplicity Detector (FMD), and the Electromagnetic Calorimeter (EMCAL) support structure. Installation and testing of the detector services is now well-underway on both the A-side and C-side of the experiment. Preparations for the installation of the remaining ALICE sub-systems are progressing steadily. Delivery of the CAEN low voltage power supplies is in progress and is scheduled to be completed in August 2007. Commissioning of the full experiment is scheduled for the 6-month period starting in mid-October 2007.

The LHCC heard a report on the status of the Photon Multiplicity Detector (PMD). Following delays due to unsatisfactory quality control procedures in the completion of the PMD module fabrication, assembly and testing, all modules have now been delivered to CERN. High voltage tests on the modules are currently underway. Installation of the PMD in ALICE is scheduled for October 2007, with the final tests and commissioning to be completed by the end of that month, albeit on a critical schedule.

4. REPORT FROM THE ATLAS REFEREES

The LHCC heard a report from the ATLAS referees, concentrating on the general status, an update of the Inner Detector installation, and a report on the ATLAS Analysis Model.

The LHCC heard a report on the general status of the experiment. Impressive progress was reported in the installation of the ATLAS sub-systems. The End-cap Toroid A (ECT-A) was successfully lowered and positioned in the ATLAS UX15 cavern. Preparations for the installation of the ECT-C are also advancing well. No major concerns were reported on the subsequent ATLAS installation phase, including that of the Muon Wheels. Good progress was also reported on the commissioning of the ATLAS sub-systems. The first full slice of ATLAS, including the Semiconductor Tracker (SCT), passed successfully the cosmic-ray test and the combined testing of more and more sub-systems is progressing according to the agreed programme for 2007. Procurement of the low voltage power supplies for the LAr Calorimeter is progressing well and the minor delay in the delivery of some power supplies for the Muon Spectrometer is not a major concern.

The referees also reported on the installation of the ATLAS Inner Detector (ID). Following the second ID heater failure in May 2007, several actions, including the re-positioning of the heaters outside the cryostat bore in order to ease access in case of further problems and the continuation of the investigation of the fault in order to identify a permanent repair, have been undertaken. Following the termination of the SCT Barrel commissioning, installation of the SCT End-Caps and the Pixel Detector, together with the Be beam pipe, has been completed successfully. However, the delay in the availability of the far heaters will have an impact on the commissioning of the ID and the issue remains very critical.

The ATLAS Analysis Model is well-developed and the large-scale implementation has started in preparation for the full commissioning of ATLAS – the so-called Full Dress Rehearsal. The ATLAS Grid infrastructure is well defined, but still needs some optimization in accessibility.
The major tools for distributed analysis have been developed and are currently in use while further developments refining the tools are in progress. All elements of the Event Data Model, including streaming, are correctly unified with only some event sizes and some elements remaining to be optimized.

5. 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.

The referees reported on the status of the experiment installation and commissioning. The complete LHCb experimental beam pipe and vacuum system has been installed, baked-out and commissioned. This complex system has a good vacuum quality and functions well and reliably. System commissioning is on-going for the Online Calorimeters, Ring Image Cherenkov Detector RICH-2, L0 Trigger and the Online System while that for the Vertex Locator (VELO), Outer Tracker (OT), Inner Tracker (IT) and Trigger Tracker (TT) is about to commence. Global commissioning by combining several LHCb systems is scheduled to start in the autumn 2007. Good progress was also reported on the RICH-1 and RICH-2 and on the Muon System. Production of the RICH Hybrid Pixel Detectors (HPDs) is approaching completion and the produced modules are of very good quality. With the installation of the M1 Muon Station in March 2008, LHCb will be complete in time for the start of LHC operation later in the year. Most of the major infrastructure works are complete and the safety systems are in operation.

The LHC also heard a report on the Outer Tracker. The cause of the ageing problems has been identified to be the glue used in the fabrication of the modules. A prototype heating blanket has been evaluated and a positive effect has been verified. Heat treatment of the OT modules in the LHCb cavern is expected to start after the summer 2007.

6. 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 integration of TOTEM in CMS.

Good progress was reported on the production of the TOTEM detectors and all detector elements are expected to be ready by March 2008. Production of the T1 Cathode Strip Chambers (CSCs) is well underway while production of the T2 Gas Electron Multiplier (GEM) detectors is complete. All eight Roman Pots have been assembled and two Roman Pot Stations have been installed in Sector 4-5 of the LHC. Two further stations will be ready for installation in Sector 5-6 of the LHC in July 2007. The first silicon detector assembly will be ready in August 2007 and will be tested at the SPS. More of the detector assemblies will be ready in spring 2008 and will be tested at the LHC with beam if possible. Some detectors will only be mounted after the LHC beam commissioning phase in order to minimize the risk of damage from any accidental beam losses. The availability of the front-end electronics is on the critical path and TOTEM should ensure that this does not result in delays in the overall TOTEM schedule.

The referee also reported on the integration of the TOTEM detectors in the forward region of CMS. The integration is being well prepared, the result of a good technical co-operation between the two Collaborations. Several elements of TOTEM and CMS are to be installed and integrated in the limited spaces of the CMS forward region and the installation procedure is to be tested in August 2007. The final installation and integration scenario will be reviewed jointly by TOTEM and CMS in January 2008.
The LHCC also heard a report on the prospects, proposed jointly by TOTEM and CMS, for diffractive and forward physics at the LHC. The experimental apparatus consists of the TOTEM T1 and T2 telescopes, and the CMS Hadronic Forward Calorimeter (HF), Zero Degree Calorimeter (ZDC) and CASTOR Calorimeter. It is expected that both CMS ZDCs will be available by March 2008 while funding for only one CASTOR calorimeter is presently secured. The installation of the CASTOR Calorimeter in CMS is presently being discussed. Moreover, evaluation of the FP420 set-up is presently on-going and a report will be available by the end of 2007.

7. REPORT FROM THE LCG REFEREES
The LHCC heard a report from the LCG referees, concentrating on the status of the Application Area, transfer tests, the CASTOR storage manager, and the status of the Storage Resource Manager. The organization of the Application Area is mature and works well, leading to an improved co-ordination of software releases with other areas, such as the middleware and deployment. The Application Area projects – Software Process Infrastructure (SPI), ROOT data analysis framework, POOL persistency framework and the Simulation Project (SIMU) - have made substantial progress and the anticipated reduction in manpower has been eased as a result of the approval of extra funding. Active involvement of remote sites is improving, but there remains much to do as disk space and tape writing capacity are often insufficient, and the need to exercise all experiments at the same time is still to be done. In order to address the latter concern, the Committee recommends that a combined test of transferring simultaneously data from the experiment pits to the Tier-0 centre and from there to the Tier-1 centres should be planned. The referees reported on the impressive improvement in the performance and stability of the CASTOR storage manager, and the referees stated that these issues remain of critical importance. Further work includes reaching the full transfer rate required by ATLAS (1020 MB/s) and having all experiments test CASTOR fully. Good progress was also reported on the Storage Resource Manager SRM 2.2. The system is ready for initial testing by the experiments. The schedule for the SRM 2.2 validation and deployment in production remains extremely tight and a roll-out plan must be prepared.

8. TEST BEAMS
The SPS and PS Coordinator reported on the accelerator schedules for 2007 and 2008, the status of the LHC injectors and the status of the experimental areas and test beams. All accelerators – the LINAC2, the PS Booster, the PS and the SPS – have been running well this year and the integrated efficiency for physics is good. A smooth start-up to the experiments and experimental areas was also reported. The machine shutdown activities for 2007/2008 include the installation of a new multi-turn extraction in the PS to provide the full intensity beam for CNGS, the maintenance of all accelerators and the cleaning of water tower and primary water circuits as well as tests of the back-up for the electrical power systems. The draft accelerator schedule for 2008 has the PS starting with beam on 28 April, the SPS on 9 May and the LHC start-up on 21 May. The accelerators are scheduled to run for physics until 22 December 2008.

9. CMS COMPREHENSIVE REVIEW
The eighth annual LHCC Comprehensive Review of CMS took place on 2-3 July, 2007. The LHCC referees addressed the following areas: the Overall Status and Issues; Tracker and Pixel Detector; Electromagnetic and Hadronic Calorimeters; Muon Spectrometer; YB0
Since the previous LHCC Comprehensive Review a year ago, the CMS Collaboration has made significant progress towards producing a detector ready for LHC operation in 2008. The past year saw all sub-detector groups successfully produce high-quality components and modules, and integrate them into the final objects to be installed into the CMS magnet. Installation and commissioning of final components in the CMS UXC55 cavern are well-underway. In particular, the heavy lowering of detector elements into the CMS experiment cavern is a major success.

The new CMS master schedule V36 incorporates the revised LHC machine schedule and includes an optimized detector sequencing. In spite of various delays, it remains possible that CMS will have an initial detector ready to exploit the initial LHC run in spring 2008. Installation of the Electromagnetic Calorimeter End-Cap (EE) and Preshower (ES) detectors is scheduled to be completed no sooner than July 2008 and CMS now plans to install the complete Pixel Detector for the 2008 LHC run.

The conclusions and concerns of the LHCC are given below. They will help the Committee to follow up outstanding issues and to monitor future progress of this project in forthcoming sessions of the LHCC.

- The LHCC noted that there are no serious technical impediments to CMS completing the initial detector in time for the first LHC run in 2008. In view of the revised LHC machine schedule, CMS has produced a new version (V36) of the experiment’s master schedule that includes known delays in the previous CMS schedule and optimized detector installation sequencing, resulting in much less risk in incurring large delays. To minimize the probability of delays during the endgame, the LHCC urges CMS to conduct a comprehensive risk analysis, prevention, and mitigation study, and not wait till a problem arises.

- Excellent progress was reported on the Tracker and the performance of the detector is of superior quality. Production of the Pixel Detector is advancing well and it is reasonable to expect the detector to be available at CERN by early 2008. Prior to its installation in CMS, the LHCC urges CMS to carry-out a risk evaluation regarding the Pixel Detector with respect to beam failures.

- Good progress was reported on the Electromagnetic Calorimeter (ECAL) and Hadronic Calorimeter (HCAL). The first ECAL End-cap (EE) is scheduled to be installed in March 2008 and the second in July 2008. Installation of the Preshower (ES) detectors is expected to match these EE installation dates, but the completion of the ES is on a tight schedule. The HCAL has participated in a successful combined ECAL/HCAL beam test and Magnet Test and Cosmic Challenge (MTCC) at which a higher than expected noise level in the Hybrid Pixel Detectors (HPDs) has been observed and is currently under investigation.

- Good progress was reported on the installation and commissioning of the Muon Spectrometer. The issue of demonstrating that the regeneration of gas by filters is made without dark current in the Resistive Plate Chambers (RPCs) remains outstanding and must be resolved.

- Excellent progress has been made on the installation of YB0 services. Following a slow start-up to the work, resulting in a one-month delay, installation of services on the YB0 is now advancing well and at present, the cable tray, pipe support infrastructure and balcony racks are ready. Substantial additional manpower has been recruited from the Tracker project and elsewhere, providing invaluable assistance to the effort.
• Good progress was reported on the commissioning of the CMS global read-out. The LHCC requests further details providing quantitative information on the status, progress and outlook in the commissioning area.

• Very good progress was reported in the area of Trigger and DAQ. Improvements to the High-Level Trigger (HLT) show that the CPU time per event on the HLT could reach the final aim of 40 ms. Preparations for the first LHC physics analyses are reasonable and are advancing well.

• A new organizational structure for the offline and computing projects has been put in place since January 2007 and includes the re-definition of goals and the involvement of new people. Good progress has been made in many areas of the offline software such as on the simulation, reconstruction, calibration and alignment, and more recently with the analysis toolkit. The commissioning of the global computing infrastructure for CMS is continuing with more emphasis currently in the preparation and validation of Tier-1/Tier-2 sites and services. The preparations for the Computing, Software and Analysis 2007 (CSA07) are on track and the CSA07 tasks have clear goals.

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), R. Mankel, P. Mato
CMS: S. de Jong, M. Martinez-Perez, 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. The LHCC received the following documents:

CMS High Level Trigger – CERN/LHCC 2007-021/G-134

Minutes of CMS-YB0 status – CERN/LHCC 2007-024/G-136

Minutes of the eighty-eighth LHCC meeting held on Wednesday, 9th May 2007 – CERN/LHCC 2007-019/LHCC 88
12. **DATES FOR LHCC MEETINGS**

Provisional Dates for **2007**:
- 25 September
- 21 – 22 November

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**LHCC Secretariat:** Morna Robillard (Bldg. 14/4-022)  
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OPEN SESSION:

2. Status Report on COMPASS                             G. Mallot

CLOSED SESSION

Present:


Invited for the presentation of the NA69 Future hadron physics program:

M. Gazdjiki, T. Kobayashi, P. Seyboth

Apologies: H. Abramowicz, J-P. Delahaye and U. Wiedemann

1. MINUTES OF THE 81th MEETING OF THE SPSC, HELD ON APRIL 17 and 18, 2007

The Minutes were approved with minor comments.
2. REPORT FROM THE CHAIRMAN

In the absence of the Chair, the Scientific Secretary reported to the Research Board meeting, RB180. The following points were presented:

i. appreciation by the SPSC of the shutdown work on CERN accelerator complex and experimental areas, which underpins the timely start up in 2007
ii. the status of readiness of the DIRAC experiment for data taking in 2007
iii. the successful first run of CLOUD in 2006, and the fact that CLOUD will not take data in 2007
iv. the impressive progress of CAST, and the status of the ongoing review for the requested extended data taking
v. the schedule projections for OPERA target mass completion through 2007 and into in 2008, and the fact that beam allocation in 2007, beyond that required to complete high intensity commissioning of the CNGS beam line, is dependent on the progress achieved
vi. the recommendation that COMPASS focus on completing the muon running in 2007, and the status of the ongoing review of the COMPASS hadron program
vii. the status of the ongoing review of the OSQAR proposal, and the recommendation that the photon regeneration part of the program be approved for 2007
viii. the endorsement by the SPSC of the report by the HARP Review Committee, and the intention of the SPSC to continue monitoring progress towards publication of results from the large angle analyses, with this as a reference

The Research Board noted these points, and confirmed the recommendation in vii).

3. STATUS OF ACCELERATORS

S. Baird reported on progress since the April SPSC, and the current status of the accelerators.

Following a successful start-up of the accelerator complex according the schedule, the LINAC2, PSB, PS and SPS complex has been operating well.

Following repair, the vacuum in LINAC2 is now better than it had been prior to the fault developing.

The high temperature seen during hardware tests on the PSB main magnet feeds was confirmed, but appears to be stable during operation. An action is planned to address this during the next shutdown.

A leak found on an SPS main dipole was a concern, but this magnet (not one those subject to the ongoing campaign of repairs) could be repaired in situ with minimal impact on operations.

The AD has benefited from specific upgrades, and improvements in the TT2 and PS resulting in a 30% net increase of useful pbar/shot. Repair of a magnet in the AD extraction line, which failed on Friday June 22nd, is ongoing and should soon be completed.
Operation of the CTF has been disrupted by a major vacuum leak at the end of the electron LINAC, which occurred on the 12th of May. This was caused by heating of a vacuum seal, induced by beam losses.

The seal was replaced two weeks later, and 30GHz power production was restarted after a four-week interruption, at a factor five lower intensity.

A modification to reduce radiation induced heating of the vacuum seals is scheduled for the next shutdown.

Hardware testing for the LINAC3 and LEIR is starting, as are preparation of PS and SPS operation with Heavy Ions. Setting up of the SPS for Heavy Ion injection to the LHC is planned for September.

4. STATUS OF EXPERIMENTAL AREAS

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

EAST AREA

Commissioning of the MCB magnet, to replace the broken MNP23 magnet servicing the South Branch of EAST AREA has been completed on May 4th as scheduled.

This allows for operation of the EAST AREA Branches, albeit with a loss of efficiency of about 30% with respect to the original configuration, depending on the exact choice of super-cycle. The SPSC supports the continuation of the study to recover full performance of the EAST AREA beams so as to be prepared to meet possible higher demands for PS beams in 2008 and beyond. This study is currently on hold, due to the lack of available manpower.

NORTH AREA

The NORTH AREA beams were restarted between the 23rd and 24th of May, as planned.

The M2 beam for COMPASS was running on May 23rd. Muon and kaon beams were successfully set up for NA62 (P328), and successful beam tests were carried out in H2 to establish the required beam conditions for NA61 (ex NA49).

The effort required to satisfy these requests is at the limit of what can be accommodated with the available manpower.

The NA60 Collaboration will submit a memo clarifying their plans for dismantling of their experimental apparatus, and possible storage requirements of components, that may be reused in the future.
AD

Commissioning of the AD facility, following successful completion of the work and upgrades carried out during the shutdown, went according to plan and the AD beam quickly reached nominal performance. Some problems encountered early in the AD physics run have been solved, and a change to 12 hour shifts has been adopted to optimize efficient use of the AD beams.

As mentioned above, a failed ejection line magnet has interrupted operations and is currently under repair.

CNGS

The repairs of the CNGS horn and reflector are progressing, and it expected that they will be completed by the end of August and middle of September respectively, in time for the start of the high intensity commissioning run.

5. PS AND SPS SCHEDULES

C. Rembser summarised the situation for the ongoing 2007 run.

The SPSC notes with pleasure the successful start of the 2007 running of the accelerators, and expresses its appreciation to both the Accelerator and Experimental Areas teams.

The main change to the schedule is that operation of the accelerators as injectors to the LHC is no longer foreseen this year.

An immediate consequence of this is that there no longer is any opportunity for extending running of the DIRAC experiment in 2007, to compensate for the loss of beam in 2006 due to the failure of the EAST AREA magnet previously mentioned.

The SPSC supports the coordinators efforts to extend the AD run to fully profit from the available PS time.

6. DISCUSSION OF THE OPEN SESSION

6.1 EM Processes in Strong Crystalline Fields NA63

The SPSC notes the preparations for the October 2007 run. Crystal preparation is a critical challenge for the undulator studies planned for 2008.

6.2 COMPASS

The SPSC notes with pleasure the progress with analysis of the existing data sets, and the fact that preliminary analysis of the 2006 data indicates that the sensitivity for the $\Delta G/G$
measurement with open charm will be in line with the projections made in 2005. **The SPSC looks forward** in particular to timely publication of the measured asymmetries and the resulting $\Delta G/G$ open charm measurement with the 2002-2004 data sets, and of the Primakoff effect with the 2004 hadron data.

**The SPSC notes** that COMPASS is ready for data taking in 2007, with a well performing detector and a new proton target, and with the goal of completing the muon program.

### 6.3 CNGS1-OPERA

**The SPSC notes with concern** the further reduction in the projected total number of bricks, from 170'000 in January 2007 to 154'000, compared to the originally foreseen 206'000.

The ramp-up of CNGS operation for physics is contingent on the schedule for completion of OPERA. **The SPSC urges all parties** to ensure that OPERA construction continues efficiently and on schedule for timely completion in Spring 2008.

Brick production continues to progress: some 25'000 bricks have been assembled so far, and **the SPSC notes with pleasure** that brick production has increased to a sustained rate of around 2’500 bricks/week. An additional increase to a rate of up to 3’000 bricks/week is claimed to be achievable, contingent on upgrading one of the BAM production steps.

A sustained rate of 2’500 bricks/week results in approximately 60’000 bricks by October 2007, and ramping up to 3’000 bricks/week is required to ensure completion of 154’000 bricks by June 2008.

Based on these extrapolations, **the SPSC supports the OPERA request** for a total of up to 6 weeks of CNGS operation in the latter part of the 2007 run, including the 3 weeks planned commissioning period. High intensity beam delivery to LNGS should continue to be consistent with avoiding interference to future shutdown activities due to irradiation of the accelerators.

### 6.4 CNGS2-ICARUS

**The SPSC notes with pleasure** that the T600 module is in its final location at LNGS and the installation of the cryogenic and other related infrastructure is progressing, **and looks forward** to successful detector commissioning by early 2008.

**The SPSC reaffirms** the interest of an extended period of data taking with the T600 detector at LNGS, with the CNGS beam as well as with cosmic rays, which in addition to the potential to provide interesting physics results, will be an important milestone in the development of the large LAr TPC technique.

### 7. FOLLOW UP ON EXPERIMENTS AND PROPOSALS

#### 7.1 NA49 Future Proposal, NA61 (SPSC-2007-019/P-330)
The SPSC notes the thorough analysis of the Collaboration resources required for the successful completion of the NA61 program, and of the proposed 2008 run in particular.

On this basis, the SPSC recommends approval for the 2008 run to perform the proposed measurements for T2K and cosmic ray analysis, running protons and pions on Carbon targets, as well as proton-proton data as reference for high Pt suppression in A-A interaction.

In addition, the SPSC welcomes the quantitative studies of the NA61 sensitivity to possible benchmark signatures for a critical point in the QCD phase diagram, as well as the optimized scanning strategy presented in Addendum 2 to the Proposal.

In the light of the above, and considering the interest of the underlying physics in question, the SPSC recommends approval for the first phase of the heavy ion program in 2009, contingent on an evaluation of satisfactory progress on the 2007 proton on Carbon analysis by mid-2008, and on the availability of the CERN resources and expertise necessary to provide the required Sulphur ion beam.

7.2 CAST

Preparations for running with He3 continue to progress, although an accumulation of small problems and delays results in being two months behind schedule. Start of data taking with He3 in 2007 is now foreseen for end of September.

The SPSC notes the analysis of the resources required to ensure CAST operation for the additional three years 2008-2010, and their conclusion that the funding scenario appears tight but feasible.

Based on this, and recalling the compelling physics case for fully exploiting the reach of the He3 program, the SPSC recommends approval for the proposed extension of the CAST operation.

7.3 HARP

The SPSC expresses its concern that HARP results, which could be affected by the TPC momentum bias pointed out by the recent Review Committee initiated by CERN and the INFN, are nevertheless in the process of being published.

In view of the forthcoming Annual Review of the HARP experiment, the SPSC looks forward to detailed comparison of results, based on the two independent analyses of the large angle HARP data.

8. OTHER REQUESTS FOR BEAM IN 2007

The SPSC supports the AD4 request for one week of beam late in the 2007 run of the AD.
9. A.O.B.

9.1 AEGIS Proposal
The SPSC notes receipt of the AEGIS proposal, and looks forward to an Open Session presentation at the forthcoming meeting of the SPSC.

10. DOCUMENTS RECEIVED

- Minutes of the 81st Meeting of the SPSC (SPSC-2007-016/SPSC-081)
- Proposal for the AEGIS experiment at the CERN Antiproton Decelerator - Antimatter Experiment: Gravity, Interferometry, Spectroscopy (SPSC-2007-017/P-334)
- Further Information Requested in the Proposal Review Process - SHINE Collaboration. This documents includes additional information requested in the review process of the SPSC-P-330 (2007-019/P-330 Add.2)
- Status Report and Beam Time Request for Experiment AD-4 (SPSC-2007-020/M-756)
- Running CAST 2008-2010 (SPSC-2007-021/M-757)
- CRYSTAL Status report (SPSC-2007-023/SR-021)
OPEN SESSION
Monday 21 May 2007 at 13:30 h, Council Chamber

The Chairman of the INTC, Mark Huyse, opened the meeting and announced the agenda.

ISOLDE Technical Report

The AB-ISOLDE representative for the INTC, Mats Lindroos, started by informing the Committee of the new responsibilities of ISOLDE staff from the AB department: Richard Catherall (AB/ATB) is appointed ISOLDE Technical Coordinator, Erwin Siesling (AB/OP) ISOLDE Superintendent, Fredrik Wenander (AB/ABP) REX-ISOLDE Superintendent and Mats Lindroos (AB/ATB) New Projects Manager. The PS Booster and ISOLDE operation sections of the AB/OP group have merged; the new AB/OP/PSB-ISO section is lead by Klaus Hanke (AB/OP).

He then summarized the technical activities and major installations during the shutdown period, including the migration of the scanner and wire grid applications to the Linux environment, the repair of the Boris tube insulators, and the upgrade of the ISOLDE offline separator. The improvements made to the organization of the shutdown work resulted in a relatively smooth start-up in 2007, disturbed by some unexpected CERN-wide control problems. The extension of the REX-ISOLDE beam lines and move of Miniball into the hall extension has been successful. The low energy stage is in a good state, but the setup of the REX-LINAC is considerably delayed. The settings for power calibration still need to be found.

The technical R&D at ISOLDE was then summarized. The Committee was informed that the tendering process for the new RILIS solid state lasers is underway and that off-line tests of the RFQ Cooler and buncher (ISCOOL) are still ongoing with promising results. Preparatory work for the installation of ISCOOL has already been undertaken.

ISOLDE Physics Report

The ISOLDE Physics Coordinator, Luis M. Fraile, reviewed the CERN accelerator schedule and the ISOLDE shift situation for the 2007 campaign. Protons were delivered to ISOLDE on
13th April 2007 and Physics started on 20th April 2007 with two R&D runs. The ISOLDE online operation will stop on 12th November 2007. There will be a one-week technical stop for both separators due to the installation of ISCOOL.

After the INTC meeting in February 2007 there are 714.5 outstanding shifts to be scheduled. Out of these, there have been user requests to schedule 480 shifts in 2007. There are requests for 260 shifts using UC\textsubscript{x} targets, 260 experiment shifts using RILIS (which entail more than 2000 hours of RILIS operation) and 205 shifts using the REX-ISOLDE post-accelerator. All those go above the availability of resources, in particular of RILIS, which has been further limited in 2007 to 1500 hours. The schedule for the first half of the 2007 campaign, taking into account the above data and limitations, was then presented (see epigraph ‘Schedule’ in http://www.cern.ch/isolde/). The second half of the schedule needs to be remade after the installation of ISCOOL has been fixed, and REX-ISOLDE is fully operational.

An evaluation of the key resources for ISOLDE and a forecast for the coming years was then presented by Luis M Fraile. In the period 2004 to 2006 a total of 1056 radioactive ion beam shifts has been delivered by ISOLDE to 101 experiments with an average of 1.78 shifts per day. Out of those, 81% were delivered to experiments approved by the INTC (“INTC shifts”), the rest being devoted to research and development runs.

Estimates of the main resources, namely actinide targets, RILIS, REX-ISOLDE and R&D activities were presented. The forecasts are based on the trend over the 2004-2006 period and assume 30 weeks of beam time per year, with a total of 375 delivered shifts, 80% (300 shifts) being INTC shifts. In case of longer running time, scaling is required. The forecasts also take into account the present schedule limitations arising from the combined operation of both ISOLDE separators, the balance between the use of low energy beam lines and REX-ISOLDE and the need to accommodate user requests for an efficient scheduling.

Actinide targets: half of the target units used in the period 2004-2006 were made of actinides (mostly UC\textsubscript{x}); 58% of the total radioactive beam time was delivered with such targets. Apart from the long construction time they also set a limitation on scheduling due to the need of 72 hours cool down time before the next target change. The amount of delivered shifts with actinide units is greatly below that requested. The minimum number of target units (for a year with 375 total delivered shifts) would be 13±1, corresponding to around 215 shifts. The number of target units would need to be increased further to meet the user requests (260 INTC shifts requested in 2007).

RILIS: half of the INTC shifts delivered in 2004-2006 made used of the RILIS. This corresponds to 45% of the total delivered shifts and 5650 hours of online operation (including setup and stable beam operation).

The demand for RILIS is very high and well above the amount of shifts provided to experiments. Due to the high isotope selectivity there is an increasing trend in the beam requests. With the present RILIS system and set-up time it is not possible to schedule more than 50% of the beam time using RILIS. This situation will be alleviated once a solid state laser RILIS system is available and offline developments can be performed in the LARIS laboratory.

The minimum number of shifts with RILIS (for a year with 375 total delivered shifts) should be larger than 170, corresponding to a RILIS online time of around 2000 hours. The number
of RILIS shifts would need to be increased further to meet the user requests (260 INTC shifts requested in 2007), once the operation limitations mentioned above are overcome. 

**REX-ISOLDE:** The number of RIB shifts delivered by REX-ISOLDE has been steadily increasing since 2003 and has reached 40% of the INTC shifts in 2006. The number of delivered shifts is well below the user requests; the trend is expected to continue and even increase after the REX energy upgrade. At present the limit of the schedule due to the REX setup time, the balance between operation and maintenance and the combination with other user requests is about 45% of the INTC shifts. This corresponds to an amount of 135 INTC shifts (around 150 total shifts) delivered by REX-ISOLDE. This falls below the user requests (205 INTC shifts requested in 2007). With the expected rise in beam time requests discussed above an increase to 165 total delivered shifts would be desirable, and even to a larger figure if this can be accommodated by REX and ISOLDE operation.

**Target and ion source R&D:** Beam development has been asked for in 15 accepted proposals and 10 endorsed letters of intent submitted to the INTC during the period 2004-2006. The requests deal with a) enhancement of beam selectivity or purity b) development of new beams c) increase of beam intensity, faster release of existing isotopes and d) improvements in beam manipulation. Based on the ongoing developments, 2 biannual beam R&D projects are required per year, that is, 4 simultaneous R&D projects. Large development projects, like ISCOOL, need extra resources.

### n_TOF Technical Report

The n_TOF technical coordinator, Paolo Cennini, reported on the technical activities at the n_TOF facility. Preliminary actions for the removal of the old spallation target are underway, but the removal is hampered by the existing hoist system, which is not adapted to handle a radioactive load. Solutions are under investigation, but they will most likely entail a further delay of 10 to 12 months and extra costs.

A clad lead target is the selected option for the new target. The use of an aluminium alloy for the cladding and the support structure will be privileged. Simulations of the neutron flux, energy deposition and temperature were presented. A visual inspection of the old target and a sample analysis are still needed to verify the feasibility of the design. The simulations need to be concluded before the final design is done and a safety file has to be written.

The ventilation of the target area was discussed next. Simulations have been performed with the FLUKA package by taking into account the release of 39 isotopes for an irradiation of $3 \times 10^{19}$ protons per year and using the old target characteristics. By assuming a continuous laminar flow the estimated dose for the critical group during a yearly run is of the order of $1 \mu$Sv. A feasibility study has been carried out and a solution will soon be adopted.
The following proposals, addenda and status reports were then presented:

1. **CERN-INTC-2007-012 and INTC-P-225**, Measurement of ground state properties of neutron-rich nuclei on the r-process path between the N=50 and N=82 shells, Melanie Marie-Jeanne.


CLOSED SESSION

Tuesday 22 May 2007

Present: S. Åberg, Y. Blumenfeld, Ph. Chomaz, L.M. Fraile (Secretary), M. Huyse (Chairman), H. Leeb, M. Lindroos, L. Linssen (part time), G. Neyens, K. Riisager, V. Vlachoudis (for point 4), U. Wahl.


1. INTRODUCTORY REMARKS

The Chairman opened the meeting by reporting that the CERN mid-term plan had been discussed by the Scientific Policy Committee. ISOLDE appears in the planned scientific programme for the period 2007-2011, whereas n_TOF is under consideration. The HIE-ISOLDE project is described in the fourth theme of the “New scientific activities for the period 2008-2011 to be funded by additional resources”. The plan will soon be discussed by the CERN Council.

2. MINUTES OF THE LAST INTC MEETING AND FOLLOW-UPS

The minutes of the twenty-eighth INTC meeting held on 15 and 16 February 2007 were approved without amendments.

In the previous meeting the Committee decided to review experiments inactive for more than three years. The Committee was informed that the administrative structure for ISOLDE users has been revised, and users can now be registered at ISOLDE independent from the experiment IS number. The Committee was also reminded that according to the general conditions applicable to experiments performed at CERN, Users can be registered up to 10 years after the end of an experiment. Administrative procedures should no longer be a justification to keep experiments open.

The Committee decided to declare the following experiments as completed:

- IS343, INTC-P-064, Test of a high power target design [J.R.J. Bennett et al.]
- IS363, INTC-P-090, Use of radioactive beams for bio-medical research [G.J. Beyer et al.]
- IS393, INTC-P-140, Doping Properties of Ferromagnetic Semiconductors investigated by the Hyperfine Interaction of Implanted Radioisotopes [S. Unterricker et al.]

The Committee requested Status Reports to be presented for the following projects:

- IS325 (INTC-P-035, Combined electrical, optical and nuclear investigations of impurities and defects in II-VI semiconductors), IS391 (INTC-P-133, Radiotracer spectroscopy on group II acceptors in GaN) and IS416 (INTC-P-167, Production of rare earth isotope beams for radiotracer-DLTS on SiC) [U. Reislöhner et al.]. A combined Status Report for the three experiments should be presented.
- IS406, INTC-P-150, Precision study of the β-decay of $^{62}$Ga [J. Cederkäll, Ph. Dessagne et al.]
3. STATUS OF ISOLDE

The Committee acknowledged the work made during the shutdown period and the smooth start-up. A discussion on the key resources for ISOLDE followed. The Committee regarded with concern that the use of key resources are well below the user requests. The Committee underlined that new scientific opportunities are opened by technical developments pioneered at the ISOLDE facility. A continuous development of the Physics programme calls for an extensive use of these costly resources and the new beams made available to the users. The Committee endorsed the report and urged to at least maintain and if possible increase the availability of the key resources to ensure the success of the ISOLDE Physics programme. In particular the increased demand of RILIS and REX-ISOLDE was noted.

4. STATUS OF N_TOF

The Committee saw with concern the accumulated delays to resume the operation of the n_TOF facility. The Committee was informed that at present there are no resources available in the AB department to carry out the highest priority task, namely removing the old target. This requires a hoist system to be functional and adapted to handle a radioactive load. The hoist system is also needed to inspect the old target in order to decide on the most suitable design of the new target. The AB department has requested an engineering study of the different options. Meanwhile the MoU has been approved by all parties but not signed yet, and the CERN management has called for a real estimate of the resources needed to resume the facility.

5. DISCUSSION ON THE OPEN SESSION AND ON LETTERS OF INTENT

The presentations of the proposals and status reports made during the open session were then discussed.

CERN-INTE-2007-012/P-225, Measurement of ground state properties of neutron-rich nuclei on the r-process path between the N=50 and N=82 shells

The experiment proposes the study of decay half-lives and $P_n$ values of neutron rich Ge, Se and Sr isotopes between the N=50 and N=82 shell closures, of interest for the astrophysical r-process. The proposal is focussed on the development of the ECR charge breeder at ISOLDE as a purification device, by making use of molecular band selection for GeS$^+$, SeCO$^+$ and SrF$^+$ beams. Although the impact on the astrophysics calculations and the understanding of the r-process was not evident, the Committee found the advent of such purification technique to access new nuclei of the highest interest. The Committee decided to recommend to the Research Board the approval of 16 shifts for this project. The proponents are asked to report to the Committee after the measurements.

CERN-INTE-2007-013/P-226, Approaching the r-process "waiting point" nuclei below $^{132}$Sn: quadrupole collectivity in $^{128}$Cd

The proposal addresses the anomaly in the excitation energy of the first $2^+$ state in $^{128}$Cd, found to be lower than in $^{126}$Cd contrary to the expectation when approaching the N=82 shell closure. Shell quenching does not provide a consistent interpretation since it is not able to explain the excited structure of this and neighbouring nuclei. Other theories may be able to
explain the effect by including deformation. The experiment intends to measure the B(E2) value of the excitation from the 0⁺ ground state by Coulomb excitation. The Committee saw the measurement of the B(E2) value with interest, although doubts were cast on its ability to discern between the different theoretical approaches. The uniqueness of ISOLDE for this measurement was underlined. The Committee endorsed the Physics case, but before the proposal can be recommended called for a measurement of the 128Cd yield and clarification of the beam intensity. This should be reported to the INTC at the next meeting.

CERN-INTC-2007-014/P-227, Further Studies of neutron-deficient Sn-isotopes using REX-ISOLDE

The proposal intends the investigation of the evolution of shell structure in the vicinity of the doubly-magic 100Sn by means of Coulomb excitation. The proponents aim at studying odd-A Sn isotopes in order to obtain single particle energies together with information on the two-body matrix elements. The Committee underlined the strength of the Coulomb excitation technique to populate the levels of interest from the 5/2⁺ ground states, but pointed out the difficulty of identifying single particle levels due to the complexity of the level schemes and the possibility of some collective effects in these odd-A nuclei. The case of 109Sn was seen as the most favourable due to the production yield and the tentative assignment of a 1/2⁺ state at around 500 keV. The Committee noted the change in beam request in the presentation compared to the written proposal. The Committee decided to recommend for approval by the Research Board 10 shifts to perform a measurement with 109Sn and to measure the yields of 107Sn and 105Sn. The proponents are asked to report to the Committee and present a revised beam time request.

CERN-INTC-2007-016/P-228, Shape determination in Coulomb excitation of 72Kr

The aim of the proposed experiment is to study the shape coexistence in 72Kr, since it is suggested to be one of the few oblate nuclei in the ground state. The first 2⁺ is predicted to be oblate, but no experimental evidence exists. The sign of the quadrupole moment of this state can be measured via the re-orientation effect in Coulomb excitation at REX-ISOLDE. The Committee found the case of the highest interest and the technique feasible to determine the sign of the deformation as already demonstrated for other nuclei. From the systematics of Kr isotopes the energy difference between the 0⁺ states of both configurations should be large enough to allow for a very low configuration mixing. Nevertheless the intensity of post-accelerated 72Kr beam seems to be at the limit for allowing a successful experiment, the most pessimistic prediction being a factor 2.5 below the experiment needs of at least 200 s⁻¹. Therefore the Committee endorsed the Physics case and recommended to include the development of an intense 72Kr beam with the highest priority in the list for beam development. A report should be addressed to the Committee on the results of the development before a recommendation can be made.

CERN-INTC-2007-018/P-229, Magnetic dipole moments of High-K isomeric states in Hf isotopes

The proposal intends the measurement of magnetic dipole moments of high K-isomers in Hf isotopes via magnetic resonance of oriented nuclei at the NICOLE dilution refrigerator setup. The aim is deducing intrinsic g-factors of the isomeric states and collective g-factors,
providing information on correlation effects. Although the extraction of the collective g-factor relies on the value of the quadrupole moment, this quantity is rather constant along the different nuclear states. The Committee saw the proposed measurement with interest, especially for the $^{177}$Hf case, and thought the precision of a few percent to be within reach. It also underlined the technical difficulties to safely perform the experiment, given the specificities of the setup. The group is asked to become acquainted with the running and safety conditions of the NICOLE setup before the experiment can be scheduled (decision to be taken by ISOLDE Physics group leader and Physics coordinator). With this provision the Committee decided to recommend the approval by the Research Board of 15 shifts.

**CERN-INTC-2007-019/P-230, Investigation of the proton-neutron interaction by high-precision nuclear mass measurements**

The aim of the proposed experiment is to measure the masses of a few short-lived isotopes to extend the investigation of proton-neutron interaction, obtained by double difference of binding energies of neighbouring even-even nuclei, $\delta V_{pn}$. The trend of this difference in the vicinity of closed shells can be interpreted in terms of the overlap of proton and neutron wave functions depending on the occupation of orbitals. The Committee appreciated the effort to measure masses of short lived nuclides as a contribution to general knowledge of nuclear properties. The interpretation in terms of $\delta V_{pn}$ provides a way to pinpoint certain nuclei which may present nuclear structure particularities. It was mentioned that some of the proposed nuclei have already been measured in other facilities. The Committee decided to recommend for approval by the Research Board 11 shifts for the measurement of the proposed Sn, Xe and Rn isotopes. Cd, Nd and Sm beams should be included in the list of beam developments to be done with lower priority (second category in list for target and ion source R&D at ISOLDE).

**CERN-INTC-2007-021/P-231, Off-Line Tests and First On-line Installation of the Laser Ion Source Trap LIST – Application for CVC Test and CKM Unitarity**

The proposals requests the off-line tests and on-line commissioning of the LIST at ISOLDE. The Committee regarded with interest this development to suppress surface ionized ions, particularly if the present limit in efficiency can be overcome. Nevertheless the physics case presented was not convincing, since the masses of $^{62}$Ga and $^{62}$Zn have already been measured to satisfying precision. The Committee decided to recommend for approval 12 shifts to perform the online commissioning of the LIST with $^{62}$Ga and encourage the proponents to propose a physics study after that. The Committee supports the allocation of 4 weeks of ISOLDE offline separator, provided resources allow it.

**CERN-INTC-2007-022/P-232, Mass measurements and decay studies on isobarically pure neutron-rich Hg and Tl isotopes**

The aim of the proposal is to carry out mass measurements and beta decay spectroscopy of neutron rich Hg and Tl isotopes. Surprisingly very little is known about these nuclei with Z<82 and N>126, one obstacle for their study being the large isobaric contamination. Such a problem can be overcome by trap-assisted spectroscopy, in this case with a new decay spectroscopy setup proposed behind ISOLTRAP. The Committee considered the proposal to be of the greatest interest. The decay spectroscopy represents an important step forward in studying this inaccessible region. The results will provide important constraints on the
effective interaction in the region. The Committee recommended 22 shifts for approval by the Research Board.

CERN-INTC-2007-023/P-233, (n,p) emission channeling measurements on ion-implanted beryllium

It is proposed to perform emission channelling experiments by proton emission induced by neutron irradiation of samples implanted with $^7$Be. The samples would be implanted at ISOLDE with a $^7$Be beam extracted from an irradiated graphite target from PSI, whereas the $^7$Be(n,p)EC measurements would be carried at ILL. The Committee regarded with interest the proposal for an alternative way of emission channelling. It will allow the study of the lattice location of Be in GaN and AlN III-V semiconductors, and of the amount substitutional Be on Zn sites in ternary Zn$_{1-x}$Be$_x$O compounds. It can also address the dependence of the $^7$Be half-life as a function of host material, and the effect of the distribution of the implanted Be ions in the host sample. The Committee recommended 8 shifts for approval by the Research Board.

CERN-INTC-2007-020/SR-007, Experiment IS444: Exploring halo effects in the scattering of $^{11}$Be on a heavy target at REX-ISOLDE

The proposal puts forward a reaction experiment to study the break-up and elastic scattering of $^{11}$Be on a heavy target in order to understand the mechanism of reactions with halo nuclei. The results of the test run of IS444 requested by the Committee were reported. Although $^{11}$Be and $^{10}$Be events were separated in the test, no discrimination between the $^{11}$Be elastic and inelastic events was possible. The Committee doubted the feasibility of separating the transfer and break-up channels given the breadth of the distributions, and the ability of the experiment to obtain the required statistics with a thin target, as proposed. It was thought that a more advanced setup, as those including gamma and neutron detection used in other facilities, should be employed to discriminate the reaction channels. The Committee considered that the allocation of 22 shifts was not fully justified and decided not to recommend the approval of the experiment. The proponents are encouraged to submit a new proposal with an optimized setup able to harvest all physics information from the reaction study.

CERN-INTC-2007-015/I-070, Direct measurement of the $^{44}$Ti($\alpha$,p) reaction of importance to supernovae, using reclaimed $^{44}$Ti

The letter of intent requests the development of a $^{44}$Ti beam for the study of the $^{44}$Ti($\alpha$,p)$^{47}$V reaction, whose cross section influences the model predictions of the abundance of $^{44}$Ti produced in core-collapse supernovae. The idea is to perform the experiment at ISOLDE by using $^{44}$Ti from the PSI copper beam dump, but the technology for the ionization of Ti does not yet exist. A further issue is the potential problems that a long-lived $^{44}$Ti background may pose for the ISOLDE users. The Committee endorsed the letter of intent and supported the development of a Ti beam with stable isotopes. The evaluation of background and safety issues for a possible run with a post-accelerated $^{44}$Ti was also encouraged.
CERN-INTC-2007-017/I-071, Development of short-lived sulphur beams for the accurate half-life measurement of $^{30}\text{S}$

The letter of intent requests a test of the production of $^{30}\text{S}$ at ISOLDE and of the cooling and bunching of this beam in ISCOOL, with the aim of performing a precise decay half-life measurement. This is one of the ingredients needed to determine the experimental $\beta$ value to perform tests of the unitarity of the CKM matrix. The Committee regarded the case with interest but thought that the n-deficient $^{30}\text{S}$ would be too hard a case to initiate the development of sulphur beams, already difficult in themselves. The Committee thought that the installation of ISCOOL and further development of negative sources should be accomplished before this letter of intent can be endorsed. The proponents are encouraged to find a broader community to support the development of sulphur beams and it is recommended to verify the feasibility of the experiment at other facilities.

Out of the 204 radioactive beam shifts requested to the INTC a total of 130 have been recommended for approval by the Research Board.

6. CONCLUDING REMARKS

The Chairman reminded the Committee that this would be the last meeting of Luis M. Fraile as Scientific Secretary. The Committee acknowledged the work done by him and thanked him for his dedication.

7. DATES OF NEXT MEETINGS

The next INTC meeting will take place on Monday 12 and Tuesday 13 November 2007. The deadline for submission of proposals is Sunday 14 October 2007.

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