

CERN-Korea Committee

Minutes of the 2nd Meeting held at CERN on Monday, 22 October 2007

PRESENT: CERN T. Camporesi (co-chairman), J. Ellis (for J-P. Delahaye), D. Jacobs
Korea J-H. Choi/MoST (co-chairman) (for C-I. Eom), Y-I. Choi/CMS,
D-W. Kim/ALICE
Observers S. Hwang/KISTI, H-S. Kim/KICOS, K. Song/KICOS
Invited F. Antinori/ALICE, D-K. Hong/Pusan Nat'l Univ. (for Items 1, 2, 3,
4 and 8), A. Petrilli/CMS, J. Schukraft/ALICE, T. Virdee/CMS
Apologies: J-P. Delahaye, C-I. Eom/KICOS

Open Session

1. Introduction

T. Camporesi welcomes those present, apologising that the email pointing to the agenda seems not to have reached MoST and Y-I. Choi. He recalls that the Korean Ambassador to Switzerland is about to sign with the CERN Director General the "Protocol to the 2006 Co-operation Agreement between the Government of the Republic of Korea and CERN concerning participation in the LHC programme" (P086/LHC).

J-H. Choi confirms that this Protocol remains specific to the LHC programme and does not embody the changes proposed earlier by CERN to widen the field of application.

J-H. Choi does not feel that agenda item 8, the presentation by D-K. Hong, is appropriate, as the subject has not been discussed with MoST. T. Camporesi points out that the CERN-Korea Committee is not a Resources Review Board. He takes the view that it rather serves the purpose of mutually informing both sides on all aspects of collaboration. On the suggestion of J. Ellis, **it is decided** that D-K. Hong should not be present for agenda items 5, 6, 7 and 9, and that his presentation under item 8 will not be minuted.

In response to the unfortunate fact that there was no opportunity to discuss the agenda with the Korean side, T. Camporesi recalls that P068/LHC provides for a Korean Co-ordinator to help with setting-up agendas etc.. So far this has not been done in an effective way and he will raise the matter under item 9. **It is so agreed.**

2. CMS Status Report (T. Virdee)

T. Virdee recalls that, within the Muon System, Korea contributes to the RPC's of the reduced RE system. There is also DAQ involvement but here some commitment is needed that would allow a firm order to be placed. He emphasises that the RPC manufacture is a complex process and congratulates his Korean colleagues on successfully producing all of the gaps for the 432 RPC's that constitute the reduced RE system. He points out that it is now necessary to construct rapidly six additional chambers of the RE1/1 type in order to test performance in this staged region, a move that will give confidence for later up-scoping to include this region. He has been discussing this with Y-I. Choi.

The installation of CMS is proceeding well. The last major item to go underground will be the Tracker (in December). The number of subsystems participating in global commissioning runs is ramping-up steeply.

The preparation for physics is now a major focus, one in which the Korean partners must also participate. Detector commissioning is presently proceeding with cosmic rays. When

LHC beam becomes available, it is hoped to accumulate rapidly up to 10pb^{-1} of integrated luminosity to allow synchronisation, alignment and calibration, and to commission the trigger, thereby opening the way to “physics commissioning”. Some 100pb^{-1} can hopefully be accumulated in a few months, already allowing the investigation of several aspects of Standard Model physics. With 1fb^{-1} the region of Higgs discovery will be entered.

To prepare for all this, CMS is currently mounting a Computing-Software-Analysis (CSA) challenge to mimic one month of operation at 50% of real capacity. From January to May '08 it is aimed to get in place all of the analyses needed for the 10pb^{-1} and 100pb^{-1} regimes, along with the associated organisation. Every effort will be made to integrate the Korean groups in this work and in the later physics analyses, particularly connected with the detector parts they have help to construct, further work on the HLT and physics using muons. The CSA challenge will already implement the model of distributing both the analyses and Monte-Carlo generation to the Tier-2 centres (in about equal amounts).

Showing a snapshot of the installation schedule, he points to the intention to release the initial production software in March, allowing Monte-Carlo production for start-up to begin in April. If the LHC starts in May, as now scheduled, CMS will still be without its second ECAL Endcap, which will only be ready for installation at the end of June.

He recalls that, as agreed by the RRB in October 2006, CMS operates with a global financial plan that foresees three-step completion of the design-luminosity detector by 2010. It was also proposed to re-scope the forward RPC (RE) system using in-kind contributions. CMS is extremely grateful to the Korean Funding Agency for the support already provided over the long construction period. It is proposed to restore the RE system in two phases. Korea has been asked to provide all of the gaps (value $\sim 580\text{ kCHF}$) as an in-kind contribution but the most fundamental request is at least to keep the gap-production facility alive. 85% of the amount needed for the first two completion steps has already been pledged by other countries, demonstrating their confidence in CMS as a tool for producing physics.

Concluding, T. Virdee stresses that Korean physicists have the same opportunities as others to participate in physics analysis. He urgently requests Korea to make commitments to the re-scoping of the RE system.

3. ALICE Status Report (J. Schukraft)

J. Schukraft recalls ALICE's physics aims to study the state of matter in the early Universe by means of heavy ion (HI) collisions, reproducing the primordial state of matter $\sim 10^{-6}\text{sec}$ after the Big Bang. ALICE will also take pp data, to provide comparison data for the HI programme and to study other topics for which the experiment is particularly well suited.

In this large (10 kton) detector, Korea is involved in the Time-of-Flight (TOF) system. Korea has several active and internationally recognised groups involved in HI physics – at the SPS and RHIC as well as ALICE. There is also a significant theory community. Much credit goes to Prof. Mannque Rho, who promoted HI physics in Korea. He instigated and later supported Korea's LHC participation. LHC is set to become the world focus of HI physics. ALICE has been actively helping the Korean community to achieve a critical mass.

Kangnung Univ. works on the TOF (employs a new technology developed in ALICE R&D over ~ 10 years). Korean funding came first via a MoST-Italy collaboration and later also through MoST signature of the ALICE MoU. Korea has participated very satisfactorily in all stages of the project and has made a very important manpower contribution.

Korea also participates in ALICE grid computing, mainly at Sejong Univ. Funding has been via MoST, first in the framework of EU FP6 and later under the ALICE MoU. The work comprises software development and computing resources at Sejong and KISTI. Both are supplying the pledged capacity (or more) with very high availability. In ALICE's

Physics Data Challenge 2007 (distributed MC production), worldwide capacity has been steadily ramping-up and Sejong+KISTI have been contributing at the 2% level as hoped for. Both Kangnung and Sejong are also involved in preparation for physics and have participated in a very important study of the decay $\Lambda_c \rightarrow pK\pi$ in pp collisions.

Near-term plans remain as described at the last meeting – a gradual increase of Korean participation, centred on analyses and grid computing. ALICE wishes to discuss with MoST the means and timescale for achieving this. No new Korean construction responsibilities are envisaged but computing capacity will hopefully ramp-up as needed. Institutes joining ALICE must pay a 50 kCHF admission fee to the Common Fund. All institutes must contribute to M&O Category A (the level is ~ 13 kCHF/year/PhD), as well as covering their own group operation expenses (travel, students, etc.).

Describing the history of M&O Cat. A payments and the procedure followed, J. Schukraft points out that the growth of ALICE members by 10% has resulted in a correspondingly decreased *per capita* M&O cost. M&O contributions are typically underwritten by state funding agencies but in some cases come from the institutes themselves (e.g. US institutes via grants from NSF, Japan via grants from MEXT, GSI pays from the institute budget). Funding by institutes is, however, not ideal (grants usually lack predictability and long-term stability) and funding directly by an agency is preferable.

A new development is the application of Yonsei University to join ALICE, with the main aim of participating in physics and analysis studies. This matter was discussed with Yonsei and MoST in the summer and the advice of MoST is now awaited.

Concluding, J. Schukraft reiterates the wish to see a gradual growth in Korean participation in ALICE and stresses that no additional construction funding is being requested.

Discussion of Items 2 and 3

J-H. Choi suggests that the CMS and ALICE requests should be discussed together.

T. Camporesi stresses the importance for CMS of completing the high luminosity detector, in particular the coverage of the forward region RPC's. CMS believes it to be inefficient to go elsewhere than Korea for gap production and suggests that the gaps be provided in-kind, thereby fulfilling Korea's CtC contribution. He was hoping to hear how J-H. Choi views the role of MoST in all of this. The experiments started their collaboration with Korea via the universities but it seems now clear that collaboration must pass via MoST.

J-H. Choi recalls that he first heard a 2 MCHF RPC request at the Oct. '06 RRB meeting.

T. Virdee points out that the Construction MoU specified a 2.6 MCHF Korean contribution but only 1.3 MCHF were provided. There are thus many reasons to think that Korea should contribute more. The proposal now made is for production of the gaps only, as explained in the letter from CERN CSO J. Engelen. The value – 580 kCHF – is calculated by the same method as used for other countries and he hopes that Korea would wish to be seen as a good collaborator.

Noting that MoST did not see why it should pay 2 MCHF, J-H. Choi acknowledges that the request is now for 580 kCHF but still does not understand the basis of the costing.

T. Camporesi points out that he is forced to conclude that MoST will not take responsibility for the MoU's signed by the Korean institutes. T. Virdee repeats that the request is made on the same basis as for any other country, as outlined in J. Engelen's letter.

J-H. Choi explains that MoST has only now had one month to consider the new request.

T. Virdee insists that the issue has some urgency, as the detectors should be installed in 2009. MoST must make some effort if it wishes to be considered as a reliable agency.

J-H. Choi thinks MoST can agree on the basis that the calculation has been done on the same basis as for other agencies. He is nevertheless concerned that, even if the contribution

is in-kind, the burden falls on the funding agency. There has been bad experience in the past with groups not satisfying their in-kind obligations within the allotted funding.

T. Virdee points out the Korean groups in CMS have already provided many gaps in-kind to the entire satisfaction of the experiment. Future production will be monitored by CMS and also in the CKC. No new facility needs to be established, although there are of course operational costs to consider (e.g., the UK estimates that for every CHF contributed to CMS, it is necessary to provide 1.5-2 CHF back home).

J-H. Choi proposes that, in order to clearly place the responsibility for operational funds on the institutes, MoST will instead contribute the 580 kCHF in cash to CMS. Due to the difficulty of identifying funds, this may not be possible until 2011-12. Meanwhile CMS can advance the money and decide where the gaps should be built.

T. Virdee points out that CMS is not in a position to give loans. D. Jacobs adds that CERN, being presently in debt itself, would also find it difficult to advance the money to CMS.

It is **agreed** to pursue this point offline with J. Engelen.

J-H. Choi is reluctant to see an increased number of Korean PhD's in the LHC experiments, due to the implications for M&O obligations. The institutes told the Korean Steering Committee that they would pay the cost increase themselves. MoST considers that this is unacceptable and requires a letter from ALICE stating that the increased number of PhD's does not imply any additional commitment.

J. Schukraft **agrees** to write a letter confirming that no additional construction contribution is required but notes that the M&O cost will of course scale with the number of PhD's.

J-H. Choi explains the rules to be observed for any increase in Korean PhD numbers:

- Regardless of the source of funding, all such agreements must go through KICOS.
- Any such increase shall be without effect on future construction commitments.
- KICOS is to be regarded as the sole funding agency in Korea.
- Korean universities and institutes are to pay M&O Cat. A via KICOS.

T. Virdee raises the case of the University of Seoul, which has applied in writing to join CMS. He asks if MoST has any objection, noting that the matter has not been discussed internally in the Collaboration and recalling that there is a charge on any new institute wishing to join. J-H. Choi responds that MoST has no objection if no cost is involved.

Concerning commitments for future upgrades, J. Schukraft notes that ALICE policy is for the cost to be borne by the institutes proposing the upgrade. This differs from CMS, which shares the cost across all institutes. T. Virdee points out that, if CMS applied the ALICE policy, the amount asked from Korea for the RPC upgrade would indeed be 2 MCHF.

4. MoST Strategy regarding CERN Collaboration

J-H. Choi has no comments concerning this point.

T. Camporesi observes that he interprets the Protocol P068/LHC as meaning that that the CERN-Korea Committee should monitor MoST support for Korean groups. He would like to receive a detailed report for Committee comments.

J-H. Choi replies that he does not understand why such a report should be provided.

T. Camporesi explains that the purpose is not to discuss or object but rather to understand the issues and ensure transparency in the way that resources are used. This will allow (e.g.) MoST to have feedback from its partners.

Y-I. Choi considers that it is not the Committee's business to look into such matters. Support at home is an internal Korean matter.

J. Ellis, speaking as someone who sits on other similar committees, comments that it is routine for the groups in countries to report. It helps to give an idea of their plans. T. Virdee adds that the purpose is informal mutual information.

Y-I. Choi requests that the Korean reports be heard in closed session.

T. Camporesi observes that J-H. Choi appears to take a different view from his predecessor, who was asking for such reports. He would like there to be a total assessment of the CMS request before the April 2008 RRB meeting.

Closed Session

5. Korean activities and plans for ALICE (D-W. Kim)

D-W. Kim reports that KICOS transferred 100,000 k won to the CERN Team Acct. in 2007. 40,000 k won cover ~50% of the 100,000 CHF due to the ALICE Common Fund. The rest has been used for group operational expenses. The Kangnung group also received from KICOS a 100,000 k won budget in Korea, covering payments to students, as well as travel and infrastructure costs. The remaining 50% of the CF contribution will be paid in 2008, when the planned transfer to the Team Account will increase to 118,000 k won, the budget at home being correspondingly decreased.

He confirms that the planned physics analyses in Korea will be related particularly to TOF data - Λ_c decay analysis and Λ polarisation. There is also a related hadron physics topic - the transverse momentum dependences of distribution and fragmentation functions.

6. Korean activities and plans for CMS (Y-I. Choi)

Y-I. Choi reports that funding was received in July for 6 CMS member institutes (2 non-member institutes are also active). Altogether 15 professors, 19 researchers and 20 graduate students are supported. As mentioned by T. Virdee, the University of Seoul wishes to become a member institute, replacing SNUE (Seoul National University of Education). There will be an evaluation of the collaboration with CMS end-March 2008. The total 2007 research funding is ~1 MCHF, covering subsistence, travel, offline computing and the construction of 7 RE1/1 chambers, as well as overheads.

The activities of the universities in CMS are organised in 4 groups: Leptons (5 professors); RPC's (2 professors); DAQ & Analysis (4 professors) and Heavy Ions (4 professors).

There are 3 candidate CMS Tier-2 centres in Korea: KNU, UOS and KISTI. It must be noted that the funding under discussion concerns only operations - not hardware. Proposals are expected for the end of the year, followed by review and finally decision in March '08.

7. Discussion on the CMS and ALICE requests

J-H. Choi emphasises that the Tier-2 selection process described by Y-I. Choi concerns only candidate selection. The funding of hardware is a matter for the institutes themselves.

J. Schukraft adds that, from his experience, is simpler to fund hardware than operations. The most difficult aspect is computer centre infrastructure, thereby putting already existing centres at a big advantage. While physicists have to co-operate very closely with the centres, it is not necessary for them to be physically located there.

J. Ellis receives assurance that KISTI coordinates CMS and ALICE computing in Korea.

J-H. Choi stresses that the Korea-CMS Research Fund is to be used only for travel to CERN, subsistence payments while there and team operations at CERN. The amounts allocated are 179.47 M won (~225 kCHF) for subsistence, 408.2 M won (~510 kCHF) for travel and 212.33 M won (~265 kCHF) for operations, for a total of 800 M won (~1 MCHF). Exact amounts for travel and subsistence are already allocated to the individual professors.

The CERN side does not feel that the inclusion of 56.5 M won (~10% of the travel and subsistence) as "overheads" is appropriate but J-H. Choi defends this as necessary.

T. Virdee recalls that Kyungpook was proposing to pledge computing capacity to CMS but T. Camporesi responds that the request was blocked when submitted to MoST.

Referring to the ramp-up of ALICE Tier-2 capacity at KISTI mentioned by J. Schukraft, J-H. Choi repeats that MoST is not providing hardware.

J-H. Choi receives assurance from J. Schukraft that he will correct orally at the RRB the statement in the status report that Korea has not paid its 2007 M&O Cat. A contribution.

T. Camporesi offers to MoST an assessment by the Collaborations of the participation of Korea in the experiments.

J-H. Choi underlines that the total funding allocation of MoST to LHC is fixed - only the sharing can change. If a new institute joins ALICE, there will be less for CMS.

T. Virdee urges MoST to consider the programme of Korean particle physics that it wishes to support rather than basing the funding on simple head-counts. It should be kept in mind that the Korean physicists will be signing papers of high quality. It is important to back the people who spend a large fraction of their time on the experiments.

J. Schukraft concedes that the 2008 budget is already fixed. If necessary, ALICE will make internal agreements. He considers that for 2009 MoST should look at the productivity of the institutes and only decide then on the level of support.

T. Virdee announces that CMS is setting up internal Memoranda of Agreement to cover how M&O Cat. B is looked after. These will have concrete provisions for the care of the various detector items.

J-H. Choi gives assurance that M&O Cat. A will be funded at least at the 70% level.

Open Session

8. Presentation of the Korean theorist community (D-K. Hong)

9. Issue related to the Protocol implementation (T. Camporesi)

T. Camporesi notes that the Korean Coordinator provided for in P68/LHC is presently not active, having no time for the task. It is essential to choose someone with both the time and the inclination to act - a respected physicist who is not a member of ALICE or CMS. He proposes that the Korean side should identify such a person and submit the name to the CKC for approval. **It is so agreed.**

10. Summary and future actions

T. Camporesi notes the decision that the Korean institutes will now pay their M&O Cat. A contributions via KICOS. He also notes that the pressure is high, as LHC moves towards start-up, for more physicists to join the Collaborations.

J-H. Choi underlines that KICOS will in future be the main actor on the Korean side in pursuing the collaboration with CERN.

The date of the next regular meeting of the CKC will be agreed in due course.

11. Any Other Business

There being no other business, T. Camporesi thanks those present and closes the meeting.

David A. Jacobs

Action list

	Raised	Item	Who	For	Status
1.	10/07	Propose a new Korean Co-ordinator as provided for in P68/LHC	Korean side	a.s.a.p.	New
2.	10/07	Confirm in writing to MoST that no additional construction contribution is implied by an increase in the number of Korean PhD's in ALICE	J. Schukraft	a.s.a.p.	New
3.		Next item			