

**ISOLDE AND NEUTRON TIME-OF-FLIGHT
EXPERIMENTS COMMITTEE (INTC)**

Minutes of the eighth Meeting on
Monday, 23 April 2001

OPEN SESSION

The Chairman opened the meeting by mentioning the changed deadline for proposal submission which is now five weeks prior to the meeting instead of three, permitting a more thorough refereeing and the possibility to even out the load on the Committee by deferring presentations to later meetings. He continued by pointing out the recent decision by the Research Board that the lifetime of approved experiments at CERN should be two years after end of data-taking. Experiments wishing to be kept as active beyond this limit should appeal for this in writing to the INTC. Furthermore, a rearrangement of the agenda was announced.

The first presentation by P. Cennini concerned the second nTOF commissioning phase performed in early 2001. This started on April 2 and lasted for 12 days. The commissioning was performed using 4 proton pulses/supercycle with $6 \cdot 10^{12}$ protons/bunch. The target was equipped with thermocouples inside and on the surface of the target which made it possible to study the thermal behaviour as function of the proton beam size, position and intensity. In steady-state operation with nominal beam intensity, the maximum temperature reached was 72°C and the thermal behaviour was in general according to simulations. Then he discussed the performance of the facility measured by fission detectors at 182.5 m flight path, yielding an energy resolution according to expectation.

F. Käppeler then presented a status report on nTOF1/PS213 (Neutron TOF Facility, Technical design Report) and the planned division of beam time by the collaboration for the rest of 2001 and 2002. He described the installation of a permanent flux detector and a sample changer into the neutron beam and various detector systems. So far, the Micromegas, the C_6D_6 , BaF and BF_3 -detector systems are installed and tested successfully. A plan for the forthcoming nTOF experiments in 2001 was presented, starting with nTOF2 (Determination of the neutron fluence, the beam characteristics, and the backgrounds at the CERN-PS TOF Facility) which aims at beam characterization, neutron fluence determination and tests of detector properties. The integrated number of protons needed to complete nTOF2 was given as $1.9 \cdot 10^{18}$, in contrast to the $7 \cdot 10^{18}$ stated in the proposal. This was to be followed by nTOF3 (The importance of $^{22}Ne(\alpha,n)^{25}Mg$ as *s*-process neutron source and the *s*-process thermometer ^{151}Sm) and nTOF4 (The Re / Os Clock Revisited). This program could be followed by a project aiming at studies of the Th-cycle for ADS, the proposal for which is still in preparation. Six further proposals in preparation were announced, regarding cross-section measurements for astrophysics, fission and ADS to be done in 2002.

The ISOLDE Technical coordinator, Mats Lindroos, gave an overview of the shutdown work achieved and the start-up of the ISOLDE facility. He described the background and considerations that had led to the exchange of the malfunctioning HRS front end for the renovated spare unit, installed during the shutdown. Within the ISOLDE consolidation project, the foundation for an entrance porch in front of the experimental hall had been cast and the hut for the RILIS enlarged and modified to shield electromagnetic interference from the lasers better. He then described the accumulated technical problems that had occurred at the start-up, delaying it by one week. The most prominent of these problems was a vacuum leak at the GPS front end which was provoked by an accidental air inlet, showing the fragility of this unit at the end of its nominal lifetime. The PS Management board had taken the decision not to attempt any complex repair of this front end, but to accelerate the construction of a spare unit.

This was followed by a report of the ISOLDE Physics coordinator, Thomas Nilsson, who presented an updated ISOLDE physics schedule. As mentioned by the Technical coordinator, the start-up had led to a delay which made it inevitable to cancel the first scheduled target. This had been put on the schedule at a later instance together with further adjustments triggered by updated or changed time restrictions from the experiments. Due to the reallocations possible, the schedule still allows for delivering 380 shifts of radioactive ion beam to the experiments. Then a brief overview of the shift backlog was shown, followed by a status report on the REX-ISOLDE experiment. Here, the achieved results and remaining problems of the sub-systems were shown, together with an updated time schedule for the completion and commissioning of the device.

Following discussions with the CERN library, U. Köster presented future possibilities for electronic submission of proposals by web. Apart from the large amount of paper copies currently needed, the proposals also have to be scanned by the CERN Document Server which causes excessive workload, decreased quality and a non-negligible fault rate. He continued by showing examples of other large-scale facilities where web-submission already had been successfully implemented and accepted by the corresponding user community.

The following proposals were then presented:

P79 Add. 2 (INTC 2001-003): Magnetic Moment of ^{59}Cu .

P138 (INTC 2001-011): Investigation of astrophysically relevant neutron-rich argon nuclei.

P140 (INTC 2001-014): Doping Properties of Ferromagnetic Semiconductors investigated by the Hyperfine Interaction of Implanted Radioisotopes.

CLOSED SESSION

Present: J. Äystö, C. Détraz, J. Eades (Secretary), H. Flocard (Chairman), M. Hauschild, H.-J. Kluge, K.-H. Langanke, K.-P. Lieb, M. Lindroos, E. Migneco, T. Nilsson (Acting Secretary), H. Ravn, J.-P. Riunaud, C. Rossi-Alvarez, B. Rubio, J. Suhonen, R. Voss, D. Warner.

Apologies: W. Scobel, J.-P. Duraud

The Chairman first welcomed M. Hauschild, the SPS/PS coordinator who, following the decision in the preceding INTC meeting, henceforth joins the Committee as an additional ex-officio member. He then pointed out that the current meeting was the last where John Eades held the function of Scientific Secretary, and thanked him for his excellent work and the enjoyable collaboration. Thomas Nilsson will take over this duty hereafter.

Apart from typographical errors, the minutes of the seventh meeting were approved with the following change; p. 4, section 8: “the six requested shifts” should be “six shifts for that part of the proposal out of the total of eighteen requested”

The Chairman then reported the successful completion of the tests on electron beam-induced photofission for production of radioactive nuclei, using the LPI shortly before shutdown (I38). The support given by the PS division in these measurements was acknowledged.

This was followed by a discussion on the delivered scientific and technical reports as follows:

1. ISOLDE Technical report

The Committee took note of the shut-down work and start-up problems encountered as described by M. Lindroos. The Committee expressed its support for the plans to accelerate the production of a spare front end, and C. Détraz pointed out that the Research Board in its last meeting expressed a similar support.

2. ISOLDE Scientific report

The Committee took note of the updated schedule shown by T. Nilsson. Then a discussion on REX-ISOLDE followed, focussed on a possible future transition from an experiment to a general facility, attracting a user community beyond the current collaboration. It was pointed out that this matter is addressed in the recently revised MoU between CERN and the ISOLDE Collaboration and that any such transition would evidently involve the PS division. The further discussion will take place when REX-ISOLDE has become operational.

3. nTOF commissioning

The Committee took note of the tests made with sensors attached to the target and the first results on the performance of the facility, and looks forward to receive the updated TDR including these results.

4. nTOF Experimental programme

After some discussion on the consequences of the reduced number of protons now needed to perform the experiments, the Committee took note of the successful completion of the commissioning and the progress of nTOF2. Regarding nTOF3 and nTOF4, the request for a nominated Spokesperson expressed in the last Research Board meeting was reiterated.

5. Web-submission of proposals

The Committee expressed its willingness to participate in such a change of submission procedures, but left the decision on details and implementation to CERN. However, the Committee opted for a transition period in which both traditional submission of paper copies and electronic submission would be possible to exclude any disruption. R. Voss stated that if the procedure is successful it may be followed by all experimental review Committees at CERN.

The presentations made during the open meeting of the new proposals and addenda were then discussed.

6. **P79 Add. 2** (INTC 2001-003): Magnetic Moment of ^{59}Cu .

The proposed measurement of the magnetic moment of ^{59}Cu was considered as important information in its own right, and interesting for large-scale shell model calculations. Furthermore, the input is valuable for the already approved experiment IS381. Thus, the requested 6 shifts will be recommended to the Research Board.

7. **P140** (INTC 2001-014): Doping Properties of Ferromagnetic Semiconductors investigated by the Hyperfine Interaction of Implanted Radioisotopes.

The Committee found the proposal interesting and fitting to the ISOLDE programme, using a broad range of isotopes not available elsewhere. Thus, it will be supported for the requested 14 shifts at the Research Board. The collaboration is expected to return with a progress report before the end of 2002.

8. **P138** (INTC 2001-011): Investigation of astrophysically relevant neutron-rich argon nuclei.

The proposed measurements were considered as interesting, both as input to astrophysical network calculations and from the viewpoint of nuclear structure. However, the experimental situation was considered as somewhat unclear since the experiment relies on reaching an improved background suppression, while clear numbers for the expected improvements are not stated in the proposal. Thus, pending a letter of clarification of the experimental situation and the technical aspects of suppression of contaminants, the final shift recommendation was deferred.

9. ISOLDE shift backlog

Following the procedure adopted in the previous assessment of the ISOLDE shift backlog, the experiments in question had been subdivided into three classes. The first class contained the three pending REX-ISOLDE experiments approved before 1999, IS347, IS367 and IS371. Here, T. Nilsson gave a short report on the status and highlighted that the limiting factor was the completion of the post-accelerator itself. The Committee decided to maintain these experiments until REX-ISOLDE is operational. Furthermore, it expressed its wish that REX-ISOLDE start as early as possible, permitting these experiments to reach completion in 2002. The second class contained experiments recommended before 1999 with more than 20% of the shifts outstanding, IS303, IS357 and IS370. Here, all experiments have requested the remaining beam time within the running period of 2001 and stand a good chance of completing their projects. Thus, it was decided to leave unchanged the shift allocation. On the other hand, any remaining allocation after the end of operation in 2001 will be withdrawn. The third class concerned experiments recommended before 1997, IS338, IS356 and three test experiments, all having not requested beam in 2001. Here, the spokespersons had been contacted prior to the meeting by the Chairman and all agreed to the cancellation of their shift allocation. Thus, the allocation for these experiments was withdrawn. However, IS338 and IS356 requested to be kept on the list of active experiment since submission of addenda was planned by both groups.

10. Letter concerning P135: Beta-Decay study of very neutron-rich Cd isotopes with a chemically selective laser ion source (L.o.I. I22, 16.4.97).

The spokesperson of P135 had sent a letter to the Committee with answers to the questions raised in the seventh meeting. The Committee found that herewith satisfactory answers were given regarding the questions expressed in the previous meeting and the 12 additional shifts will be recommended to the Research Board.

OTHER BUSINESS

T. Nilsson reported that very promising machine development work was in progress at the PS-division. The first investigations of a more rapid cycling of the PS Booster, with a base period of 0.6 s instead of 1.2 s, had encountered no major technical obstacles so far although major work remained to be done. The prospect of ultimately having twice the number of proton pulses available from the PSB would mean that the agreed proton beam intensity for ISOLDE according to the Memorandum of Understanding could be delivered and exceeded without causing implication for other proton beam users at CERN. Furthermore, increased target lifetime could be expected through a more regular pulse structure. The positive perspectives of this prospect were confirmed by the PS representatives and the SPS/PS coordinator who pointed out that nTOF could also benefit from such a change. In view of the established interest in physics with radioactive ion beams, the Committee expressed its support for any technical development that could aid in assuring the required proton beam intensity for ISOLDE and nTOF and recommended that CERN pursue the above developments described with as high priority as possible.

The next meeting is on **Monday, September 24**, and the deadline for submission of proposals is **Friday, August 17, 2001**.

The date of the remaining INTC meeting for 2001 is:

November, 26-27.

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