

MACHINES AND AREAS COMMITTEE

Summary of meeting No 26, May 8, 1974

Present : O. Barbalat, G. Baribaud, D. Bloess, D. Dekkers, D.C. Fiander, G. Gelato, M. Georgijevic, C. Germain, L. Hoffmann, U. Jacob, H. Koziol, A. Krusche, P. Lefèvre, J.H.B. Madsen, G.L. Munday (Chairman), G. Nassibian, G. Plass, J.P. Potier, C.E. Rufer

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1. Pulse to pulse intensity modulation

a) Long term

J.P. Potier presented the up-to-date document he had prepared on the subject. (MPS/OP/Note 74-20).

It was agreed that no more than 3 different beams should sequentially be produced in a given supercycle (25 GeV/ISR/SPS). A 4th setting should be prepared in a backing store (say reduced (less than 1 Tp/p) intensity in case of fault) but might require some resetting up before being available.

Close contacts on beam requirements should be kept with users. Joint PS-ISR meetings (E. Brouzet, D. Dekkers, K. Hübner, D. Neet) are planned. A similar set up will be arranged with the SPS now that running-in preparations are going to be organized soon.

Preferred methods of intensity reduction in the Booster were reviewed by H. Koziol. It was agreed that in the long term (when vertical emittance blow-up in the PS is cured), vertical scraping in the Booster would be the best method for ISR. Change in the number of injected turns seems the most interesting for other users. The use of RF gymnastics techniques (low RF trapping or RF spill-out) depends on studies and may depend on progress at the ISR to take advantage of a possibly higher longitudinal density. The insertion of a sieve in the Booster injection line has also its advantages but some people expressed reservations about the reliability of the mechanism. The required rating should however be easy to achieve by comparison with existing actuators. In fact, most of these techniques are complementary and may have sometimes to be used together.

G. Gelato and G. Baribaud reviewed the necessary Booster hardware modifications (they are summarized in an appendix to Potier's paper). The change

of parameters from cycle to cycle can be achieved by having additional local memories or by using a front-end computer. The computer aspects of the latter solution will be included in the proposal of the future PS computer system prepared by the CCI Group for the end of June. Different opinions were expressed at the meeting as to the desirability of having to change from cycle to cycle so many of the Booster parameters, compared to the PS, where much fewer modifications seem necessary. This is due to a difference of approach, more systematic at the Booster (be prepared for everything), more pragmatic at the PS. It was agreed that more studies are needed on this subject; the realization of hardware should wait until agreement between PSB and PS accelerator experts has been reached. Studies have already started and more will be scheduled in the Booster Machine Experiments programme.

As to the PS, the main work is associated with the new timing sequencer (J.P. Riunaud) and the programmer (J. Boillot - MPS/OP/Note 74-18). Besides that the new generation of function generators (128 vectors) have the flexibility required by the intensity modulation. Possibility to modulate the number of turns directly injected at 50 MeV has also to be considered although it does not need to be as elaborate as for the Booster. A survey of possible methods will be prepared.

The Booster will prepare a project proposal by the beginning of the Summer. At the same time, it will also be better known whether the modifications at the PS are of relatively modest scale and compatible with the controls expansion project or if one has to make a separate project proposal.

b) Short term

For the future runs at intermediate (5 Tp/p) intensity it would be desirable to send to the ISR a beam at half of this intensity. A rapid solution should be found. The change of the number of injected turns in the Booster or horizontal scraping are the preferred solutions.

In parallel, P. Lefèvre urged that the BR Group finishes rapidly the 800 MeV emittance measuring line to allow more accurate measurements of the results of these various emittance reduction schemes and to permit progress on the matching to the PS without which further improvement in the PS is not possible.

2. Additional FAK Modules

D.C. Fiander presented a proposal for 3 additional FAK modules (9 modules are now in service). It is justified for a number of reasons :

- With 12 modules it might be possible to remove both partial aperture kickers (13 and 97) and save on their maintenance. This removal should take place only after the FAK system has demonstrated its reliability over a significant period of time (i.e. > 1 year). However, there will then be no protection against major accident involving several or all FAK modules.

- At high intensity, beam interaction may force a reduction in the FAK voltage to avoid sparking.
- Lowering the voltage will increase equipment reliability.
- At the intermediate intensity, 9 modules with full voltage are necessary, at 26 GeV/c, for fast extraction from s.s. 74 or 58, the average break-down frequency is one module every 5 to 7 days, so installed spares are very desirable to avoid stopping the operation.

It was agreed to go ahead with this project. Since it is estimated at 1.4 MFRs, a formal proposal will now be submitted to the approval of the Director-General.

During the discussion it was approved to uprate the capacity of the present system to 5 zones. As long as the partial aperture kickers are available, there seems no need to press for installing rapidly a 10th module. The magnetic properties (remanent field) of the FAK magnet are satisfactory and one can use the spare ferrite for the new magnets.

3. PS Installation Programme

U. Jacob reviewed the questions raised by his memorandum of March 19 (MPS/SM/Mem. 74-10) :

- Additional enlarged correction elements are needed because of the enlarged chambers of the continuous transfer scheme. The construction of the additional skew quadrupoles will continue to be supervised by M. van Rooy. The SM Group (R. Ringueley) will built the additional vertical injection dipole for s.s. 30.
- P. Lefèvre asked that whenever enlarged chambers are no more needed, they be replaced by normal ones and normal correction elements and P.U. electrodes be re-installed in order to avoid continuous construction of additional enlarged elements.
- The first periods in 1975 will have only a limited number of high energy sextupoles because of progressive installation in the PS ring. This situation is acceptable provided that one does not go then beyond 5 Tp/p.
- In view of the good performance of FAK, one can agree to the removal of KM 13. This will be confirmed in one month. It is still open whether it will replace KM 97 or be completely removed, the present magnet remaining in s.s. 97.
- The dump target will be installed in s.s. 93.
- In view of the limited use of FE 74 (only until 1977), it was decided not to schedule the replacement of the bump coils by bumper dipoles since they would only be used for about 2 years.

4. Vacuum Chamber Aperture

This problem has been raised several times during this meeting (FAK, fast bumper for continuous transfer, enlarged chambers) and will be discussed at the next meeting.

5. Shut-down

The annual shut-down is scheduled as usual for after Christmas with a nominal six weeks duration.

6. Next Meeting

Thursday May 16 at 14h30

Agenda : - PS Magnet (PSB excluded)
- Static dump line
- Chamber aperture.

O. Barbalat

Distribution

PS Scientific Staff

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