

MACHINES AND AREAS COMMITTEE

Summary of meeting No 7 (May 2, 1973)

- Present : O. Barbalat (Secretary), M. Georgijevic, L. Hoffmann,
J.H.B. Madsen, G.L. Munday (Chairman), G. Plass, K.H. Reich,
C. Rufer, C.S. Taylor.
- Invited : D. Dekkers, C. Germain, U. Jacob, W. Kubischta, P. Riboni,
C. Steinbach

1. Additional facilities for Omega

In answer to a request from the Omega Group to have beam available a larger fraction of the total time, W. Kubischta has studied several possible schemes of extending the availability of SE 16. In view of the limited time (up to mid'1975) that such a scheme could be used, it has to be cheap and easy to operate and implement; 3 solutions have been studied by W. Kubischta (see memorandum dated 10.4.1973).

i) Slow ejection of one bunch after fast extraction of the rest of the beam

This has been tried successfully (MD of 22.3.1973) and should be quite acceptable both for the PS operation team and for a parasitic use where the low high frequency duty factor of 5 to 10 % is not objectionable.

ii) Sequence of SE 16 and SE 62 on consecutive cycles

Besides requiring the installation of additional dipoles, this scheme makes an inefficient use of the protons. It would also introduce a rigid linkage between the energies for ISR, West Hall (including BEBC) and SE 62. It can therefore be ruled out.

iii) Simultaneous sharing of SE 16 and SE 62

This scheme was already studied in 1971 but abandoned in view of its costs. If one considers however only a beam of small emittance (1π mm mrad) there is a relatively cheap solution requiring only a thinner (0.15 mm anode instead of 1.5 mm now) electrostatic septum in s.s. 61. Such a device is anyway needed for continuous transfer to the SPS.

The implementation of this scheme has however several disadvantages :

- great complexity for the operation and substantial additional load on the MCR crew.
- rigid linkage between the energies for ISR, West Hall and SE 62.
- shortage of beam gymnastics equipment (dipoles and power supplies) - see minutes of MAC meeting No 6 (MPS/DL/Min. 73-9).
- the present intensity would not allow to feed adequately all the users simultaneously and very uneven sharing ratios (say 90 % SE 62 and 10 % SE 16) for parasitic operation would be very difficult to achieve.
- the emittance limitation of the scheme would preclude its use at a higher intensity level where a higher emittance is expected.
- the total losses inside of the machine would be higher although each ejection per se would have the same efficiency.

It was decided to go ahead only with scheme i) and not pursue the other two.

A thin long electrostatic septum shall however be installed in the ring to gain experience for the continuous transfer to the SPS. It will be put in a location where it could also serve as a standby in case of problems with ES 83 or TSM 85.

2. Planning of work in the ring involving break of vacuum

P. Riboni described the present situation of the PS vacuum system and the work of the vacuum section.

- Increase of the number of actions involving break of vacuum compared with previous years.
- High number of pump failures related to frequent openings of sectors to air and tough working conditions to reduce pump down time (ion pumps switched on at too high initial pressure). Comparison with PSB pump failure rate is quite striking on this respect.
- Shorter pump life-time (12.000 hours against 35.000 expected) requiring time consuming work for reconditioning.
- Increase in average personnel doses.
- Large number of new equipment to be tested for long duration in the laboratory (septum magnets, kickers, targets, beam monitors, etc.)

This situation is a source of grave concern. A certain degradation of the vacuum section service is feared. Recent emergencies like the septum 16 failures show that one is dangerously near the breakdown limit of the service.

U. Jacob showed a list of past and future scheduled installations involving break of vacuum. Each year, 50 to 60 straight sections are concerned in the major shut-down alone, not counting actions due to failures and last

minute requests. It appears that this number is not likely to decrease in the foreseeable future. Furthermore West Hall conversion to 200 GeV operation with its many beam lines and the new Linac project will require additional vacuum effort.

There is no simple solutions to this situation which is partly linked to the continuous evolution of the PS. Some propositions were made which may contribute to ease up the matter at least to some extent :

- Purchase of additional pumps to enlarge the spare stock.
- Contracting the reconditioning of used pumps to outside firms (some controls by CERN staff will remain necessary. Work on activated pumps may have to continue being done at CERN but use of regie people can be envisaged).
- Renewal of the leak detection equipment.
- Possibly, training of additional people (from outside the vacuum sextion) to habilitate them to perform some work on their respective vacuum systems, or reduction of assistance to other groups for equipment testing. These groups would have to rely more on their own resources.

But above all it is imperative that all the persons involved with systems installed or to be installed in the ring become aware of the critical load existing on the vacuum service and act accordingly.

Installations in the ring are under the responsibility of the PS Installation Committee (PIC - Chairman : U. Jacob).

- It must be informed well in advance of any planned installation.
- Installation dates must be kept flexible and equipment ready in time so that its installation can be grouped with other elements in the same sector.
- The PIC may have to enforce stricter rules and refuse "last minute" requests even if they are "special cases".
- New equipment must be designed by taking even more into account the constraints of vacuum service :
 - . design elements which can be installed without break of vacuum such as the split magnetic elements introduced by F. Rohner;
 - . target mechanisms designed for operation in the 10^{-7} torr region (cold welding problems). (Their design is started).

3. Next meeting

May 23, 1973 - 14h30

PS Small Conference Room

- Provisional agenda :
- Proposals by J. Gruber and F. Rohner for additional auxiliary elements and supplies for orbit correction (see minutes of previous MAC meeting - MPS/DL/Min. 73-9, section 2-g).
 - External beam dump (see MPS/CO/Note 73-28 by J. Boillot).

Combined 10/25 GeV cycles and successive operation at different intensities will be discussed in June.

O. Barbalat

Distribution

PS Scientific Staff

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