Minutes of the Linac4 Technical Design Committee

meeting no. 1

date: 04 April 2006

present:

AB/RF	M. Pasini, J. Broere, R. Wegner, C. Rossi, O. Brunner, M. Vretenar
AB/ABP	G. Bellodi, A. Lombardi, E. Sargsyan
AB/BI	R. Garoby, L. Soby
AT/CO	J. Serrano
AB/BT	W. Weterings
TS/CV	Y. Body
TS/EL	J. Pedersen
TS/CE	A. Lopez
TS/SU	M. Jones, T. Dobers
AT/VAC	E. Page
AT/MEL	W. Kalbreier
SC/RP	M. Silari, M. Magistris

agenda

1. Introduction to Linac4 and to the Technical Design Report (Maurizio Vretenar)
2. Transfer line between Linac4 and PS Booster (G. Bellodi)

1. Introduction to Linac4 and to the Technical Design Report (Maurizio Vretenar)

Linac4, intended to replace Linac2 as injector to the PS Booster, is designed to double the booster brightness and intensity, thanks to H- injection and to the higher injection energy (160 MeV). The DG foresees a decision at end 2006, with construction covering 2007-10, and commissioning in 2010. For booster injection Linac4 will have to operate at a maximum duty cycle of 0.1%, but the RF structures will be built for a larger duty cycle (10%), needed in case this machine would be used in future as injector for a high-energy linac (the SPL). However, the Linac4 infrastructure (including most of power supplies) will be dimensioned only for the low duty cycle. The “natural” location for Linac4 is in the old PS South Hall, where a 100 m long area is available for the new machine. If Linac4 is then used for the SPL, it will have to be moved to another location. The Technical Design Committee will prepare a Technical Design Report (TDR), which has to be completed in September 2006. Meetings are foreseen once per month, with the goal of coordinating the groups involved in the detailed technical design, with short presentations and a round table discussion. For the TDR, each section has one or more persons who should take care of collecting the data and of writing the chapter. The technical chapters written for the CDR2 of the SPL can be recycled and eventually completed. Deadline for the preparation of the individual sections is end of May.

Discussion:

- It was pointed out that general services (electricity and water) usually suffer from changing parameters, and that they should not provide an output at the same time as the others. It is agreed that an extended deadline (end of July) will be given to contributors that require an input from the design sections.

- About the cost of Linac4, a first estimate has been recently made, based on some update of old SPL data, coming to a total of 55 MCHF. This is just a preliminary figure, and the TDR in preparation now will be used for a more precise cost estimate, to be done after the report.
- The radioprotection constraints for the South Hall are quite important, and they would suggest placing Linac4 in a newly built tunnel. This option has been explored and is considered expensive (8 MCHF) for a machine that could be moved elsewhere after 5-10 years of operation. For the installation in the South Hall, the new linac will probably have a smaller contribution to radiation than the PS at full intensity, and it is agreed that in case the acceptable loss rate is exceeded the machine will have to be stopped. The dump at the end of the linac has not been designed in detail yet, and there is not manpower available to finalize the design before May. However, the TDR can contain a general design, leaving details for a later stage.

2. Transfer line between Linac4 and PS Booster (G. Bellodi)

Beam transport from Linac4 to booster is not an easy problem, and is a compromise between beam dynamics issues and the constraints imposed by the existing tunnels and machines in the PS complex. The latest scheme foresees 3 pairs of achromatic bendings embedded in FODO periods, with two debunching cavities. The line crosses the shielding wall between South Hall and PS ring, and then continues for about 32 m inside the PS tunnel. After PS, it crosses the inflector region, cutting through the existing Linac3 to LEIR line, to reconnect to the existing Linac2 to PSB line. Total length is 110 m, and remain to be studied the civil engineering problems of crossing through the existing shielding walls and the radioprotection issues.

-- MaurizioVretenar -

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