

Minutes of the Linac4 Technical Design Committee

meeting no. 7

date: 06 December 2006

present:

AB/RF	M. Pasini, F. Gerigk, P. Baudrenghien, R. Wegner, C. Rossi, M. Vretenar
AB/ABP	G. Bellodi, A. Lombardi, E. Sargsyan, Th. Meinschad, R. Scrivens, C. Carli
AB/PO	J.P. Royer
AB/OP	K. Hanke, B. Mikulec
AB/BT	W. Weterings
TS/MME	M. Timmins, P. Bourquin, Y. Cuvet
TS/CE	A. Lopez-Hernandez
TS/SU	M. Jones
AT/MEL	T. Zickler
SC/RP	M. Silari, E. Mauro

agenda

1. News from Linac4 (M. Vretenar)
2. News on the Linac4 location (S. Maury)
3. Layout of the Linac4 line in the inflector zone (M. Timmins)
4. Surface requirements for Linac4 klystrons and racks (M. Timmins and C. Rossi)
5. Tour de table
6. next meeting

1. News from Linac4 (M. Vretenar) [↗](#)

The Linac4 Technical Design Report is now completed (after some last minute corrections) and available at the web address: <http://doc.cern.ch/archive/electronic/cern/preprints/ab/ab-2006-084.pdf> [↗](#). A sufficient number of paper copies (250) will be ordered to the CERN Print Shop (ordered after the meeting, should be available at the end of week 50). Authors will receive by internal mail their own copy. Most of the cost estimates related to the TDR have been received (missing are only BI and vacuum). Linac4 has been included in the Second Theme of the White Paper presented by the DG to the Council, as a “high priority programme, to be achieved in 2011”. Resources indicated in the White Paper for Linac4 are 55 MCHF and 115 MY. The White Paper is now subject to a recommendation from the reviewers of the SPC, expected for March 2007, and to the funding by the Member States, for which a decision is also expected in the first half of 2007. The most likely scenario is a “slow” start of the project in 2007, with limited funding available, waiting for more funds coming from 2008. However, few high priority activities have to start already in 2007.

2. News on the Linac4 location (S. Maury)

A meeting [↗](#) was held on November 21st, in order to present to AB Management the three options for the location of Linac4 (South Hall, at the position of Linac2, in a new building at Mont Citron). The different options were described (civil engineering, radiation protection, operational aspects) and discussed. A preliminary estimate indicates that the difference in costs of the different options is within 10 to 15 %, the less expensive being the South Hall and the most expensive the Mont Citron. In the analysis, it was pointed out that option 2 (Linac2) requires a stop of all CERN accelerators for at least 2 years in case shielding of the

Linac2 building is reinforced, and longer shutdowns (3 to 4 months) over 3 years in case shielding is only partially reinforced and some Linac2 buildings are closed during operation (option still to be confirmed by radiation protection). For these operational reasons, option 2 has been discarded. About the first option (South Hall), some concerns remain for radiation to the offices close to the Hall and for the operational problems related to the long transfer line going through the PS (stray field from PS magnets, access to PS, reliability). The Mont Citron option is more expensive, but does not present operational problems. At the end of the discussion, S. Myers asked to advance on the study of the Mont Citron option, making it compatible with a new layout of the LHC injectors, to avoid displacing Linac4 in case the SPL is built. The cost to build Linac4 could be higher but substantial savings could be realized on the long term. A Study Group with AB and ST expert has been therefore set up, which is expected to come out at the end of March with a proposal on the location of Linac4, SPL and PS2 on the Meyrin site. This layout should allow to inject from Linac4 into PSB and to build the other machines in a second moment. However, several technical problems concerning this layout have still to be addressed, and the South Hall option remains valid as an economic back-up solution in case a new layout is not found or not approved.

3. Layout of the Linac4 line in the inflector zone (M. Timmins) [↗](#)

Some (three) interferences remain in the inflector zone between the Linac4 line and TT2 line and Linac3 shielding wall. Some modifications to the position of Linac4 elements are still required in order to assess the mechanical feasibility of the Linac4 line.

4. Surface requirements for Linac4 klystrons and racks (M. Timmins and C. Rossi) [↗](#)

A module made of 2 LEP type klystrons with power converters, waveguides, controls and circulator requires about 90 m². Multiplying this figure by the 7 pairs of LEP klystrons we get 690 m², and adding the about 80 m² needed for the (vertical) 700 MHz klystron, the overall space for RF is therefore about 770 m². A number of 181 racks has been estimated for Linac4, for a total surface between 300 and 350 m² depending on the configuration. The total surface required comes up to 1100 m², and including some space for circulation and accessing equipment, 1300 m² are considered necessary for Linac4.

Tour de table

- M. Silari informed that the study of a steel-reinforced roof for Linac4 in the South Hall has been finished, confirming that this is a viable solution to increase the clearance for the crane at the high-energy end of the linac. Although work on the Linac2 option has been stopped now, the radiation protection studies that were made for this option will be anyhow published as an internal note.
- A. Lombardi mentioned that the study on the foreseen beam loss level in Linac4 is now completed, and it led to a redesign of the steering layout and to a redefinition of position and number of beam monitors. Now even in the worse loss scenario the “hot spots” (= high loss points) remain below 1 W loss level.
- W. Weterings started a discussion on the requirements from the PSB side to go back to Linac2 and protons after the commissioning of Linac4. It was made clear that this should be considered only as an extreme emergency solution, in case of a major problem with Linac4 during the first one of two years of operation. In this case, not to stop the CERN machines, it could be considered to switch back to Linac2 and protons after a few weeks shut-down required for reverting to the old system, and this only for a limited duration (few months?) until the problems with Linac4 are solved. The linac injector is too an important device not to have a “back-up solution” until we are sure of the reliability of the new linac. Already in the past, after commissioning of Linac2 in 1978 the old Linac1 was kept operational for protons until the early 80’s, when it was converted to heavy ions (and still, it had a

spare proton source until 1992).

- G. Bellodi mentioned that she is interacting with M. Timmins on correcting the layout of the Linac4 line, in order to overcome the interferences in the inflector area,

The meeting ends with a celebration for the achievements in 2006 and the traditional exchange of wishes for 2007.

next meeting:

to be announced

-- MaurizioVretenar -

This topic: SPL > L4technicalDC7

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