

Minutes of the 15th ILC@DESY General Project Meeting, September the 2nd, 2005

- 1) Nick Walker: **Status of the ILC Accelerator Design**, talk presented at Snowmass 2005, Co-author: Barry Barish
Minutes taken by: Alessandro Bertolini

Deadlines from Snowmass:

- a) By the end of 2005, a **Baseline Configuration** has to be defined. It will be designed during 2006 as a *forward looking* configuration, which we are *reasonably confident*, that can *achieve the required performance* and can be used to give a *reasonably accurate cost estimate* by mid to the end of 2006.
- b) The Baseline Configuration will be fixed among the cost estimate into the **Reference Design Report** (RDR) by the end of 2006. The RDR will include all the **alternatives**.
- c) What do we mean by alternatives? A technology or concept which may provide *significant cost reduction, increase in performance* (or both), but which will *not be mature enough* to be considered as a baseline by mid-end 2006. However, nobody can stop people with from investigating not-mature alternatives.
- d) A **Baseline Configuration Document** (BCD), including technical specs, parameter tables, documentation (reports, drawings, etc.) has to be produced by the end of 2005.
The BCD will be a structured electronic document, usable as a reference for each WG and GG; a printable/readable summary (around 100 pages) will also be available.
Comment from Lutz Lilje: the BCD has essentially to produce cost estimates!
- e) The BCD will also include an ACD on alternatives, each provided with supporting documentation and description of potential gain (in terms of budget and performance).

Directions to BCD (proposal resulting from answers to 40 basic questions that Tom Himel put forward)

- a) **Luminosity parameters:** nominal 500 GeV with $2 \times 10^{34} \text{ cm}^{-2} \text{ sec}^{-1}$, arising from a tradeoff between damping rings and the beam delivery design. Still open options but not heavily altering the LINAC design.
- b) **Gradient:** the recommended baseline design is the TESLA 9-cell, with an operational gradient of 31.5 MV/m. Alternatives for energy upgrade were proposed; the most supported is the *low-loss (LL)* design. Possible upgrade schemes with LL cavities give 20 Km long 500 GeV linacs.

- c) **Baseline Klystrons:** 10 MW mbk, 1.5 msec/pulse with 65% efficiency. Mainly off-the-shelf; alternatives proposed but actually no means for improved sources.
- d) **RF distribution:** recommended TESLA TDR and XFEL solution. A lower cost improvement proposed based on two level power division.
Comment from people: had negative experience at DESY with this alternative design, painful for tuning.
- e) **Modulators:** 115 kV, 135 A, 1.5ms pulse. As new Tesla design; prototype will be tested in 2006.
- f) **Damping Rings:** still no recommendation. Expected for this autumn. Three designs have been selected : the 17-Km Tesla ‘dogbone’, and two 6-Km and 3-Km ‘circumference’ designs. A systematic analysis of the different configurations is being made. Also waiting for R&D on kickers results.
- g) **Positron source:** Undulator recommended by WG3a. No requirement for pre-damping ring. The laser Compton source is considered as an alternative but needs strong R&D. Conventional sources are available as well, if necessary.
- h) **Beam delivery system:** recommended two interaction regions, with 20 and 2 mrad and two detectors with longitudinally separated halls. 0 mrad crossing angle is still on the table and in addition, a mid crossing angle (10-12 mrad) is also being considered. The choice of crossing angles is strongly physics driven.
- i) **Siting:** sample sites, to be included in the BCD and the final selection is to be identified by December 2005.
The US selected a site near Fermilab. Japan and Europe officially still have not made a decision. Siting and the complete conventional facilities must be included in the RDR by December 2006.
- l) **Tunnel configuration:** 2-tunnel recommended by WG2/GG3.
- m) **SCRF test facilities:** regional facilities must provide the R&D, necessary also for the baseline configuration. This issue is very critical to reduce costs. This would enable each region to significantly participate to ILC Main Linac and be a possible host of ILC.

Transition to the GDE

- a) 49 members identified by the three regional directors and Barry Barish (see preliminary list in the talk); the BCD executive committee have been nominated.
 - b) The ‘strawman’ BCD will be presented at the **GDE Meeting in Frascati**, 7-10 December.
 - c) The BCD publication will be the first great milestone of GDE.
- 2) **Announcement:** 16th ILC@DESY General Project Meeting will be on Friday 16th September.