

Director's Corner

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An official change of name

A strategy has been emerging over the past months to define a new baseline configuration for the ILC Technical Design Report (TDR). Beginning with the well-established Reference Design Report (RDR) configuration, we are selectively proposing changes that can significantly improve the cost to performance to risk. The anticipated final configuration has been referred to as the "Minimum Machine," however this misnomer has caused endless misunderstandings and misinterpretations. A new, more descriptive name for the process we are undertaking, **Accelerator Design and Integration (AD&I)**, became official at the first working meeting towards defining a new ILC baseline held at DESY from 28 to 29 May. Much was accomplished and points of contention were defined at this lively interactive working meeting.

One might ask why we should change the RDR configuration. There are many reasons, but the most important one is that we have identified various areas where we believe significant cost savings can be achieved without increasing the risks substantially, and we have found other areas where performance or technical solutions may be improved. Our project managers and integration scientist have established a [selected list](#) of possible changes for evaluation. These potential changes are not all independent of each other, so evaluating and determining which changes to make in the baseline is rather complicated.

Some of the proposed alternatives we are considering were identified during the RDR design process, for example the single-tunnel versus double tunnel-option. At that time, we adopted the conservative but more costly double-tunnel solution for the RDR, but our flagged intent was then to consider the viability of a single-tunnel solution as part of the post-RDR design studies. Since that time, alternative schemes for delivering the high-level radiofrequency power have been proposed which may help enable a feasible single-tunnel solution. Resolving the question of a single tunnel will involve availability (or reliability) studies, satisfying safety requirements, and it may well be site-dependent in the detailed solutions. We will devote considerable effort towards studying all of these factors. Even if a single-tunnel solution is adopted for the TDR baseline design, the double-tunnel solution as documented in the RDR document will remain a viable alternative, thereby giving potential hosts the opportunity to choose which option best fits their particular situation.

The total set of possible incremental changes to the RDR put forward by the Global Design Effort project managers and integration scientist for the initial discussions and planning at DESY included:

1. A Main Linac length consistent with an optimal choice of average accelerating gradient (currently 31.5 MV/m, to be re-evaluated)
2. Single-tunnel solution for the Main Linacs and RTML, with two possible variants for the HLRF
 - a. Klystron cluster scheme
 - b. DRFS scheme
3. Undulator-based e⁺ source located at the end of the electron Main Linac (250 GeV)
4. Reduced parameter set (with respect to the RDR) with $n_b = 1312$ and a 2ms RF pulse.
5. ~3.2 km circumference damping rings at 5 GeV, 6 mm bunch length.



Ewan Paterson, GDE Integration Scientist at the DESY workshop. He is playing a lead role in integrating the central beam tunnel configuration



Overall, the DESY meeting was described by some as a "mixed bag."

6. Single-stage bunch compressor with a compression factor of 20.
7. Integration of the e+ and e- sources into a common "central region beam tunnel", together with the BDS.

Also, for the positron source (item 3), an alternative independent electron-driven source based on a 300Hz s-band linac was discussed.

Although this meeting represented the beginning of a process and not a decision-making event, an informational and preliminary set of [notes](#) on the outcome of this meeting will help focus the work as we move forward. The long-term goals are to refine these studies further such that detailed evaluations and discussions will be possible at the next GDE meeting in Albuquerque in September. The baseline configuration and alternatives that will be used for the TDR design to be completed in 2012 will be finalised early next year.

In upcoming Director's Corners, I will address the individual baseline changes that are being considered. In my opinion, it is healthy for us to selectively evolve the RDR design and also to include alternatives to the baseline in our TDR design effort. This will result in a more optimised and flexible technical design report that will be well suited to use as the basis of real funding proposals, whatever the conditions dictated by the science, the site or other circumstances may be at that time. Simply, our overall goal is to be as ready as we can be to make the strongest possible proposal for the linear collider when the time is right.

-- *Barry Barish*

This is evident in the rather different reactions of Nick Walker and Marc Ross, two of our project managers, at one point during the meeting



Our third project manager, Akira Yamamoto, has a concerned reaction and Nick Walker is less effusive reaction at another point during the meeting