The Global R&D Board Status

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Activities of the RDB

In its first three months, the RDB worked on creating a detailed set of Ideal R&D Priorities. We understand that these have been studied by a number of funding agencies and laboratories. In the last six months, we have moved on to these tasks:

- Advising Regions and Funding Agencies directly.
- Setting up Task Forces to create a R&D Plan in a given Area.
- Project Tools for forming and tracking the R&D Plan:
  - **See following presentation by Eckhard Elsen**

Need interfaces with other GDE functions: cost and engineering.

Advising Americas Regional Director on the 2007 Program

- We attended the review of the DOE/NSF ILC R&D program for 2007 in May.
- We mapped the Ideal priorities we had completed on the Americas program, finding some gaps and some differences of structure, and setting aside areas of regional interests.
- In June we went item by item through the Proposals, studying priorities from a global point of view to suggest how the optimal R&D program could be reached: evidently this is not always the same as the Ideal Priorities.
- Meeting with the Regional Directors, we discussed the need for flexibility across national and regional boundaries to ensure an optimal sharing of tasks; this is visibly taking place in the work of the Task Forces.
- The RDB will be at work next month together with the U.S. planners of the 2008-9 Plan to find an optimal and justified program within the funding guidelines.

Advising the UK PPARC ON ILC

- The Regional Director for Europe advanced the cause of globalization of the GDE substantially by bringing about an request by PPARC for the RDB to act as a reviewer of the LC-ABD proposal to carry on the ILC R&D in the UK.
- The UK support for the Linear Collider R&D has been impressive in scope and in focus. The new proposal will carry this work on, and includes a number of new initiatives to address issues of great importance to ILC.
- Since the budget may not allow a broad increase in scope, the gauging of priority is important, and we have been told that our efforts, with full cognizance of the global context, were helpful.

Europe, continued

- The importance of the contributions of DESY in the past development of superconducting acceleration are well recognized, and we have been active in fostering global contributions to the work at the facilities there, and close collaboration with the TTC, which must be an on-going effort.
- We expect interaction with the EUROTev efforts and particularly the new proposals under the EU FP7 initiative. Brian Foster will ensure that the expertise of the GDE is taken into consideration in the proposals.

Asian Region discussions

- There has been a continuing and fruitful dialog with the Asian Regional Director and KEK managers, largely on very concrete matters relating to our Task Forces S1 and S2, which have been vital to achieving work plans that mesh well with the global R&D Plan. The capabilities and success of the efforts there are essential to the progress of the superconducting cavity and module R&D.
- We are supplying information to the Regional Director our recommendations for the highest priority tasks, rather than a line-by-line review of the whole program in Asia.

Unnamed Task Forces

- To complete a global R&D Plan, we are proceeding by a sequence of focused studies, which we call Task Forces, devoted to well-defined areas.
- The leadership is normally from the RDB, but the five to ten members are drawn broadly from the experts.
- There is a charge, suitable to lead to a R&D Plan, approved by the GDE EC.
- The aim is to complete a Draft R&D Plan for the whole ILC by November 2006
- These Task Forces will evolve into units which track the R&D Plan execution
- We have proposed to the EC that there be a R&D Day at the February GDE Workshop, to allow broad comment on the Plan.

Klystrons, first unamed Task Force

- The urgency of the need for narrowing the focus of the R&D on different klystron designs became clear at the last meeting of the MAC
- Taking advantage of a meeting where most of the experts from the three regions were in DESY, RDB member Terry Garvey coordinated a discussion where not only was a consensus reached on the scope (dropping the idea of ordering upgraded versions of the old 5MW tubes), but a new, solid plan for coordinating the development globally was agreed.

Task Force S0/S1: accelerating gradient

- The LC R&D Goals established several years ago are still conceptually valid, and we continue to give them numbers easy to remember, and suggestive of priority:
- S0: accelerating gradient in a nine-cell cavity
- S1: average gradient in one cryomodule
- We decided that these goals are so closely correlated that they were best handled by one Task Force:
- S0/1 or S1 for short, members Lilje (Chair), Hayano, Higo, Mammosser, Padamsee, Ross, Saito
- You have heard a presentation showing that this work is in an advanced state

Task Force S2: performance of a string of modules

- The S2 Charge raises a number of broad questions:
  - **how many modules should be required for this goal?**
  - **What configuration of RF, Controls, Cryogenics, Beams (??), Instrumentation etc?**
  - **Are there Regional consideration that require some similar installations in different locations?**
- Members: Hasan Padamsee (Co-Chair),Tom Himel (Co-Chair), Bob Kephart, Hitoshi Hayano,Nobu Toge, Hans Weise, Consultants: Sergei Nagaitsev, Nikolai Solyak, Lutz Lilje, Marc Ross, Daniel Schulte
- The Task Force has made substantial progress in addressing the complex issues involved in this program of large scope, and will be completed on our schedule.

Task Force S3: damping rings

- The ILC has a large and demanding Damping Ring system, with many aspects demanding extensive R&D. The S3 Task Force, led by Andy Wolski, has been organized, and will present its Charge and members list to the EC soon.
- There is already an extensive documentation in a nice project form that will allow an effective organization of the R&D. It is based on an established collaboration of groups interested in this topic, and will move ahead to distribute the tasks in a defined global collaboration.
- There is already progress on the collection of information on the resources required. This can be a model of the methods and tools needed for the whole R&D Plan.
- It will fall into the responsibility of S3 to evaluate the justification of the test facilities like ATF2, CESR-TF, and HERA DR.

Task Force S4: Beam Delivery System

- A diverse set of R&D is needed for this system, including beam instrumentation, beam dynamics and special magnets.
- Marc Ross has been in discussion with the groups interested in these topics and will have the organization in place soon.

Task Force S5: Positron Source

- The requirements of the positron source go beyond the state of the art, and the Baseline design needs substantial R&D and corresponding resources. The alternatives probably cannot receive the same attention at this time.
- Eckhard Elsen is organizing this task force, pulling together the interested participants distributed globally. We expect that this will be ready for presentation to the EC soon.

Other R&D

- There are a number of other important systems in the ILC that require some amount of R&D, including the Electron Source and timing issues in the Controls.
- We note that there is an important interface between R&D and Engineering and Design, and we need to devote effort to exploring this interface, and that between R&D and cost studies, especially those that lead to R&D associated with design changes.

Summary

- Six task forces have been formed and are in various stages of work, the klystrons having done their work, and S4 and S5 now organizing.
- The R&D Plan will be prepared by November
- The Resources required will be compiled, using the standard GDE system of FTE and materials etc.
- There is proposed to be a R&D Day in February in Beijing to air the issues widely
- Tools are being set up to track the R&D: we believe that professional project engineering effort will need to be identified.