Possible Minimum Machine Studies of Central Region for 2009

Reference, ILC Minimum Machine Study Proposal V1, January 2009 ILC-EDMS Doc # 865085

A) Proposal for 2009 Study Schedule

B) Some assumptions

C) System Questions and Goals for first two quarters of ’09

D) Goal for Jan 2010

General Schedule

First Quarter or up to TILC09

Civil:3D:CAD Team and Technical Area Groups (TAG) work quasi-independently on design questions and CAD capability some of which are listed in later slides.

Second Quarter up to July 1st

TAG (as above) complete approximate optics decks for the selected (few) options for further study.

Third Quarter up to Albuquerque meeting (ALCPG)

Systems and 3D Team produce consolidated central region drawings for selected (few) options and Cost Management Group begin evaluating these options.

Final Quarter of 2009

All:- Study these options for technical feasibility, performance, impact on installation, operation, safety and costs. Propose new baseline for evaluation in 2010

ASSUMPTIONS

- Plan mainly addresses “Source and BDS Integration (Central Region)” **Ref. Section 2.3**
- Other studies:- Main Linac **Section 2.1**
  - Low Power Option **Section 2.2**
  - Single stage Bunch Compressor **Sec 2.4**
  - TeV Upgrade **Section 2.5, 2.8**
  - Value Engineering **Section 2.6**
- These will continue through the first three quarters of ’09 ‘*somewhat*’ independently but must be ready for inclusion, integration and overall evaluation in the 4th quarter.

Questions, Assumptions Goals for Q1,2

- ELECTRON SOURCE Questions

- **Are there significant changes in design since RDR?**
- **Would there be significant changes for the Low Power Option?**
- **Assuming Klystron Clusters, what are the problems with a single tunnel which could be ~ 5m diameter?**
- **Same question but also sharing the same tunnel with the BDS?**
- **Assuming all of the above are being implemented can we have a self consistent optics deck by July 1, 09**

Do not assume that e- injector side of the central complex has to be symmetric with the e+ side!

Early answers to these questions will expedite the overall Minimum Machine Studies

Questions, Assumptions Goals for Q1,2

- POSITRON SOURCE Questions
- **Is the consolidation of the main and auxiliary source considered technically feasible and if so when will an approximate set of parameters be available? For this question one should first assume NO sharing of tunnel with the BDS but a single ~5m tunnel.**
- **What is the impact of the Low Power Option?**
- **Are there significant changes to the parameters and layout, compared to the RDR, to accommodate variable energies with the source at the end of the linac?**
- **Will there be an approximate optics deck available by July 1 (or earlier), which accommodates above changes and can be used by 3D.CAD team for integration studies?**

Early answers to these questions will expedite the overall Minimum Machine Studies

Questions, Assumptions Goals for Q1,2

- DAMPING RINGS Questions
- **Can we assume that DR designs for either 6.4 or 3.2km rings (*assuming low power option)* will be feasible and can be used in studies of the Central Region? Ref Sec 2.3**
- **What other changes in DR parameters are possible with the Low Power Option?**
- **Will there be optics decks for the injection/extraction regions and beam lines available by July 1 , to allow the 3D CAD team to study consolidation of beam lines, sources and BDS? *This is a question for several groups as it will require earlier coordinated optics studies with Sources and RTML systems.***

Early answers to these questions will expedite the overall Minimum Machine Studies

Questions, Assumptions Goals for Q1,2

- BEAM DELIVERY SYSTEM Questions
- **BDS will continue to explore several design options related to Minimum Machine Studies. *See section 3.6***

  These include Low Power related optics parameters and performance over a range of energies up to 1 TeV, overall designs which allow increased emittance growth at the higher energies.
- **Study alternate layout and equipment design for major instrumentation.**
- **Can a 'best approximation' optics and layout, incorporating the results of these studies, be available to the 3D CAD team by July 1 to begin studies of possible consolidation of Sources and the BDS. The E+ and E- sides do not need to be symmetric if there are significant benefits in the overall size of the Central Region.**

Early answers to these questions will expedite the overall Minimum Machine Studies

Ideal Goal for Jan 2010

- **(Q1 and 2) Have a 3D layout of some difficult ILC Facilities using RDR parameters.** E+ Source, BDS, Central region and assuming twin tunnels
- **(Q3 and 4) Have a 'feasible' 3D example layout of Consolidated Central Region, between linacs.** Sources, 3km DR's, RTML/Inj,Ext Lines, BDS in this region. "New BDS'? New e+ source with auxiliary source? SINGLE Tunnel?
- **(Q3 and 4) Have enough information to give to Cost Management Group / CFS to produce a rough estimate of cost differences, impact on installation and operation including personnel safety.**
- **IS THIS POSSIBLE? WE NEED TO GIVE IT A TRY AND THEN**
- **REVIEW BEFORE WE REALLY KNOW THE ANSWER!**