

JINR (Dubna) GDE Meeting

Conventional Facilities & Siting

General overview and scope

The June GDE meeting (Workshop) will be held at JINR, Dubna, 4-7th June 2008 (we expect the welcoming reception to be on the evening of June 3 and a possible site tour on June 7). Unlike previous GDE meetings (e.g. the Tohoku University meeting in March 2008), the JINR meeting will not be held in parallel with an ILC Physics and Detector workshop. The meeting will span three complete days, with the first morning session and last afternoon session as plenary sessions, leaving two-half and one full-day available for parallel group activities.

As the workshop title suggests, the meeting will focus on Conventional Facilities and Siting (CFS), which has been identified as a primary cost driver. Four themes have been identified for the parallel session discussions, which aim to understand the potential cost impact of CFS solutions both for the current ILC Reference Design and alternative scenarios. Specifically the goals of the workshop are to

- examine the CFS requirements for ILC reference design;
- develop models for cost scaling to various alternative sites and CFS configurations, in particular shallow sites and single-tunnel options;
- examine the conventional facilities of the machines with particular attention to the cost drivers (process cooling water etc.), and understand the impact on them with respect to the choice of site configuration;
- evaluate possible alternative layouts of the accelerator (including the support infrastructure), which may lead to cost reduction (specifically via interaction with the CFS requirements), and to understand the performance/cost trade-offs of these alternatives.

The workshop will also include discussions of CFS issues for CLIC in an attempt to identify common cost-effective solutions for both machines.

The JINR workshop differs significantly in scope from the Tohoku workshop, in which R&D planning and MDI issues (in conjunction with the detector groups) were a central theme. The JINR meeting will complement the Tohoku workshop by focusing more on engineering-orientated design issues of the collider itself, with a strong emphasis on cost containment and reduction (following on naturally from the discussions on possible Cost Reduction Studies at the Tohoku meeting). Cost containment/reduction of the cryomodule and other Main Linac technology components will not part of this meeting.

Focus Groups (Working Groups)

For the parallel sessions, four focus topics (themes) have been identified to facilitate discussions towards the general goals of the workshop (primary Technical Areas noted in parentheses, *conveners to be confirmed*):

A. Shallow Solutions (CFS/Global & Integration)

All three sample sites for the ILC Reference Design are so-called deep-tunnel solutions. As an alternative, shallow-site (or near-surface) solutions should be considered and studied, with a particular emphasis on possible cost impact (cost saving). The options for near-surface solutions should be enumerated and a possible cost impact for each scenario should be estimated. The group should consider and review the two proposed (but different) shallow options at JINR and DESY, Hamburg respectively, as well as considering a “generic” optimum shallow site. The discussions should include consideration of the accelerator tunnel configuration, including single-tunnel options (both European XFEL-like and surface service building solutions). The group should consider the potential benefits of near surface sites for both ILC and CLIC.

Conveners: (JINR, TBD), John Osborne (CERN)

B. Infrastructure (CFS/Global)

Review infrastructure requirements (processed cooling water, power distribution, air-conditioning *etc.*) for both ILC and CLIC, and begin to develop cost-effective solutions for them. Attempt to quantify performance-cost derivatives of the requirements by developing suitable metrics. Review and attempt to quantify the impact of the tunnel depth of the proposed solutions (link to group A). Develop and catalogue the impact of the choices of fundamental infrastructure parameters (e.g. ΔT for cooling water). Attempt to develop parametric models suitable for scaling to alternate (accelerator) designs.

Conveners: (JINR, TBD), Atsushi Enomoto (KEK)

C. Staging & Siting Options (Accelerator Systems & Integration)

The CFS solutions for the RDR sample sites were based on a single baseline solution for the accelerator (reference design). Alternative or staged designs which might make cost-effective use of existing infrastructure or other geographical features of any given potential host site were not in general considered. The siting group should explore and consider possible footprints and layouts of the machine at possible sites, which – although they may be specific to those sites – may correspond to a cost-effective solution for that site. The group should also explore the possibility of staged approaches, again making possible use of any existing feature at a potential site. All Accelerator Systems groups and the HLRF and Main Linac Integration groups should participate. The group should make recommendations for further more detailed studies.

Conveners: Ewan Paterson (SLAC), Nikolai Solyak (FNAL)

D. Accelerator Systems Design (Accelerator Systems & Integration)

Cost effective solutions for the CFS have clear impact on the design of the accelerator and its sub-systems. This group will focus on developing and understanding the cost-performance trade-offs of the accelerator design. Continuing the strategy developed at the Tohoku workshop for cost reduction studies, the conceptual design of a so-called *minimal 500 GeV machine* which contains no performance overhead or margin will be

further developed. The group should work towards quantifying the cost-performance increments for various performance-driven features, while also exploring alternative layouts for the machine that prove cost-effective. A specific focus for this particular meeting will be the injector chain, including electron and positron sources, damping rings, RTML (bunch compressors) and BDS. The goal of the workshop is to begin to specify the minimal machine, and to catalogue the cost increments and performance (risk) impact as compared to the current reference design.

Conveners: Andrei Seryi (SLAC), Masao Kuriki (Hiroshima/KEK)