

Review of the International Linear Collider (ILC) Electrical and Mechanical System Design to be held at CERN on 21 March, 2012

The purpose of the Review is consider specified performance criteria and evaluate how the mechanical and electrical technical design solutions formulated by the ILC team address these. The ILC design is under development in parallel in each of three global regions. Conventional facilities (electrical and mechanical) design work from two of these, Asia (Japan) and Americas (US) will be presented. It is not the intention of the review to directly compare and contrast these two with each other. At the review, representatives from the Asian Region will present the Mechanical and Electrical Designs that have been developed using the Asian Region High Level RF (HLRF) system suitable for a mountain site in Japan and representatives from the Americas Region will present the Mechanical and Electrical Designs that have been developed using the Klystron Cluster RF system suitable for the Americas Sample Site.

Ample time will be available in the agenda for open discussion among all participants. The Review Panel will produce a report to the GDE Project Management that records panel impression and comments of the designs presented as well as conclusions reached during discussion periods.

The ILC high – power superconducting linac presents new and interesting technical challenges that are sure to be interesting.

(A separate meeting – 22 to 23 March, also listed on the indico page, but is not to be confused with the Review).

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Electrical and Mechanical System Design to be held at
CERN on 21 March, 2012

The review panel will consist of:

Marc Ross (Fermilab – ILC) Chair

Vic Kuchler (Fermilab – ILC)

John Osborne (CERN – ILC) Host

Atsushi Enomoto (KEK – ILC)

Philippe Lebrun (CERN)

Mauro Nonis (CERN)

Francois Duval (CERN)

Mechanical

- How much heat is rejected to air?
- How is the egress strategy linked to the HVAC?
Does the air flow change (flow direction /flow rate) during an emergency
- Accelerator load cooling water may be radioactive – the return lines are in the support side. A DP tank may be needed.
- (the pipes are close to the top of the tunnel – water can leak on the equipment)
- The KCS halls have a high heat load to air – and require heavy duty heat extraction

Mechanical (2)

- Is there a need for booster pump redundancy?
- Need to show the new alcove air handling scheme
- Does the air flow rate mix the stratified gas layers – in case of He leak?
- Is there a need for higher volume air ‘flushing’
- Can the tunnel fan coil system be simplified using better insulated RF components?
- Can higher temperature excursions be tolerated?
- Will airpacks be required?
- Redundancy for ventilation fans . Are pressure differences required? Are desired pressure differences maintained?

Electrical

- How is the 66KV distributed? Are the cables multi-line? How long are they? How are they shielded?
- ISO standard allows two kinds of lightning-grounding: totally separated from distribution-ground or connected via ZnO surge arrester. Which should be used?
- Electrical power quality? Are there criteria?
- Cable routing should provide proper redundancy.
- Emergency power needs for recovery of He gas in case of loss of power.
- What are the UPS criteria?

Electrical(2)

- What is the best compressor motor voltage? Marx (baseline) input voltage?
- Should we connect to the local distribution?
- UPS/battery Low voltage for the control system. Where is it listed?
- What is the most cost-efficient main power transformer redundancy? $N=1$ or $N=3$?
- The communication and safety electrical networks should be separated.