



**Project Managers'
Report**

MAY 2010

***ILC Global Design
Effort***

In May, 2010, we report progress with the ILC-GDE R&D activities in TDP-1 as follows:

Major events and progress in May, 2010:			
Technical Area	Event and/or Progress	held/hosted	Days
General	- The 4 th ILC-PAC review	IFIC, Valencia	May 13-14
SCRF	- Completion of S1-Global Assembly - Workshop on Cavity Industrialization - TAGL webex meeting	KEK Kyoto,	May May 23 May 7
CFS/GS	- Preparation for CF Review at KEK - TAGL webex meeting		May 12
AS	- Preparation for BAWs - TAGL webex meeting		May 21
PM-AD&I	- Preparation for TDP R&D Plan Rel. 5, - Planning and preparation for BAWs - AD&I webex meeting		May 26

IPC-PAC:

The 4th ILC Project Advisory Committee was held at Institute de Fisica Corpuscular (IFIC), University of Valencia, Valencia, Spain, on 13/14 May 2010. The GDE reported recent progress on the SB2009 proposal and discussion with physic/detector communicated. In the closeout, the PAC supported the cost containment concept of SB2009 proposal, and advised us to improve communications between the GDE and the detector community.

Global cooperation for cavity/cryomodule assembly and test: S1-Global:

Preparation for the cavity/cryomodule assembly and test (S1-Global) has progressed on schedule as expected. The assembly work of the eight-cavity string was completed by the end of May at KEK, and the S1-global cryomodule is now ready for cool-down and RF tests to be completed by the end of this year. The global cooperation with numerous laboratories

is highly appreciated.

Workshop on the SCRF cavity technology and industrialization:

A workshop on the ILC SCRF cavity technology and industrialization occurred at Kyoto, May 23, as a satellite meeting of the 1st International Particle Accelerator Conference 2010 (IPAC-10). The workshop was organized with 65 participants from laboratories and industries worldwide. Fruitful discussions were held on industrial models for ILC cavity production from the viewpoint of both laboratories (project) and industry (mass-production). All the presentations and the meeting summary are available at the following URL:

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=4530>.

CF Review

A CFS internal review on the design study of the Asian Single Tunnel CFS design suitable for mountainous regions was held at KEK on June 1-2 in preparation. It is to be the first review of three regional studies including regional specific features and constraints.

The review agenda is available at:

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=4613>

R&D Plan Release 5

The draft release 5 of the TD phase R&D plan is to be submitted to the Executive Committee by the end of June. Following on from the ILC2010 workshop held in Beijing, the PMs are in the process of reviewing and restructuring the plan to focus on TD Phase 2 activities. This requires a major (if not complete) re-write of the original document (Release 4). The PMs have produced a new outline and will drive the editing. Instructions to the TAG leaders were discussed in the TAG Leaders meetings during this month.

Baseline Assessment Workshops (BAWs)

The dates for the two BAWs have been set for September 7-10 at KEK and January 18-21 (2011) at SLAC. The first half of the first workshop (BAW-1 at KEK) will focus on the issue of average accelerating gradient, while the second half will deal with the single-tunnel configurations and in particular the HRLF solutions (KCS and DRFS). The workshop announcement was

distributed to wider community including physics/detector groups on May 3. The announcement for the second BAW (BAW-2 at SLAC) will be made in June. BAW-2 will deal with the relocation of the positron source and reduced beam-power option.

AD&I Study on Higher-Luminosity with 10Hz Operation in Low Energy

Following on from the work at the Beijing workshop, a summary of the status of the 10Hz operation scenario for low-energy running has been produced and is available in ILC-EDMS (ID# [D*907775](#)). A focus AD&I meeting on 10Hz operation was widely announced, and to be held for June 23rd.

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=4530>.

1.0 SCRF

(meeting minutes:

<http://ilcagenda.linearcollider.org/getFile.py/access?resId=1&materialId=minutes&confId=4582> and

<http://ilcagenda.linearcollider.org/getFile.py/access?resId=1&materialId=minutes&confId=4616>)

The general activities in SCRF technical area in May is summarized in the minutes of SCRF monthly meeting as follows:

1.1 Cavity

Reports from Group Leaders

- Cavity Gradient (Rongli Geng)

As a report of the progress in US, AES-009 dressed cavity was tested at HTS (Horizontal Test Stand) in FNAL and reached 35 MV/m without measured field emission, consistent with the last vertical test result at JLab (36 MV/m quench limit without field emission). This cavity is "Cryomodule-ready".

A new 9-cell cavity, RI-029 (heavy EP at RI, 800C vacuum furnace heat treatment at JLab, final EP and cleaning at FNAL/ANL), was tested at VTS (Vertical Test Stand) in FNAL and reached 35 MV/m at Q0 >1E10 in its first pass measurement without measurable field emission.

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=4588>

- Cavity Integration (Hitoshi Hayano)

In the S1-G collaboration, module-A warm-coupler installation

was finished. Doorknob installation is under way. Vacuum leak check of the cryostat was done and no leaks were found. Monitor cabling is under way and software preparation for measurements will be finished soon. Final pumping of the cryostat will start this week, and cool-down is to start on June 7.

The Project Managers expressed their sincere thanks to all the people from the collaborating institutes worldwide for their hard work to complete the S1-Global cavity and cryomodule assembly as planned.

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=4619>

- | | | |
|-----|-----------------|--|
| 1.2 | Cryogenics | <ul style="list-style-type: none">• Cryogenics (Tom Peterson)
FNAL CFS group asked Tom Peterson about the impact of layout change in cryogenics system for the proposed solution for a mountainous region (compressor location and so on). The proposed solution represents a substantial scope change from the RDR cryogenic system, and will require further study. Kenji Hosoyama of KEK proposed this configuration during the CF review preparation on Asian single tunnel in mountain regions. Tom is asked to provide comments and advice concerning this issue. |
| 1.3 | Cryomodule | <ul style="list-style-type: none">• Cryomodule (Norihito Ohuchi)
The group leader, Norihito Ohuchi, confirmed the S1-G status. PMs expressed their special thanks to Norihito for his leadership in the S1-Global cryomodule assembly and preparation, which has been successfully completed on schedule. |
| 1.4 | HLRF | <ul style="list-style-type: none">• HLRF (Shigeki Fukuda and Chris Nantista)
Although no special report from KEK side (by Shigeki), there was progress in design study of DRFS especially with finding a possible cryomodule and DRFS assembly with the cryomodule mounted on the floor (instead of suspending it from the ceiling) in a single tunnel layout. Chris reported on the R&D status at SLAC: the large pipe section for the KCS tests is now in place; the MBK klystron tests have resumed since there is a problem of 2nd harmonics; and the conditioning of the Marx generator is now complete. |
| | ML Intergration | Akira has asked Chris Adolphsen to prepare a report on the quadrupole magnets in the cryomodules and related issues in communication with Jim Kerby and Vladimir Kashikhin. |

Special Topics

- Preparation for TDP R&D Plan Update (release 5)
Akira asked TAGLs to provide a compact description on the R&D issues to be included in the new R&D plan (release-5). The draft due date for preparation and contribution from each group has been postponed to June 11 and the R&D Plan release 5 to the end of June. Akira explained the R&D issues which he had sent to the TAGLs; Akira requesting the TAGLs to report on the status and give advice on these issues.

BAW-1

The preparation of BAW-1 (Single tunnel HLR system and Accelerating Gradient) should be completed by the end of August. It will be discussed in the next SCRF webex meeting at the end of June, and the TAGLs are requested to report their preparation status.

2.0

CFS/Global Systems

2.1

CFS

The highlight of the last month's activity was the review, hosted by KEK, of the Single Tunnel Design of the ILC in a mountainous region. In preparation for the review the group met together via teleconference several times to explore the critical aspects of the mountain region design and develop a list of questions to be included in the review material. The technique proved to be quite valuable and the limited time of the review meeting itself could therefore be used efficiently.

The most challenging aspect of mountain region is the management of ground water. The consultant engineers, whose work was presented, recommended the construction of a small, parallel pilot tunnel well ahead of the main tunnel which houses the superconducting linac and its support equipment.

The consultant engineers have produced a design report which was summarized in the review material. The review committee report is due in a few weeks. The engineering team is expected to focus on costing the mountain region underground complex.

2.2	Low Level RF	The Fermilab Test Stand group presented test results from a recently developed Lorentz Force detuning piezo control algorithm. The algorithm is based on a least-squares inversion of a finite impulse response sequence. Initial results appear excellent and may support plans to use piezo-tuners to provide stable phase and amplitude in multi-cavity systems. The group plans to apply the new algorithm during the S1Global cryomodule tests in fall 2010.
3.0	Accelerator Systems	(meeting minutes: http://ilcagenda.linearcollider.org/getFile.py/access?resId=1&materialId=minutes&confId=4581)
3.1	BDS	ATF/ATF-2 has undergone a period of 'continuous running', where a beam size at the 'IP' of ~300 nm was achieved – a factor of 2 larger than that expected for the given optics and ATF emittance. A reduction of this factor-of-2 is expected from numerous corrections and tuning on many fronts over the next period.
		A workshop on R&D for the superconducting final quadrupole magnets will be held in Annecy on June 14.
		The ATF-2 project meeting will be held at KEK in the week of June 30.
3.2	Beam Dynamics	Much progress has been made in consolidating the status/results of the emittance preservation performance for the Low Emittance Transport (LET, basically everything downstream of the damping rings). A few outstanding numbers still need to be resolved, and additional simulations will be made at FNAL. There remains some concern that the dynamic emittance budget is not yet fully understood, and may currently be too low (i.e. unachievable in simulations). A review of the existing simulations, which are now quite old, will be made in preparation for a meeting in July. A current focus topic is the issue of cavity gradient 'flatness' over the 1ms beam pulse. Emittance growth arising from the transverse kicks from the physically pitched (misaligned) cavities puts a constraint on the individual cavity gradients of a few percent, which is quite demanding for the RF systems (particularly LLRF). Further studies and discussions are planned over the

next months leading up to the October workshop (Joint ILC-CLIC).

- 3.3 Damping Ring
- 3.4 RTML
- 3.5 Sources

No progress on the R&D front beyond that which was reported in April.

Several important meetings announced:

- CFS face-to-face meeting at Daresbury 12-13.07, where the focus will be the e+ source and damping rings.
- 7th ILC e+ source collaboration meeting will be held at DESY (Hamburg) on 15-16.07. This meeting will specifically focus on the baseline undulator scheme and planning for TD Phase 2.
- POSIPOL workshop (KEK, May 31-June 2)

4.0 Test Facilities

- 4.1 ATF
- 4.2 ATF2
- 4.3 CsrTA
- 4.4 FLASH

5.0 Other

- 5.1 AD&I
- 5.2 Cost Management

Triad's ILC Cost Estimating Tool (ICET) and applications to ILC RDR Estimate: J. Carwardine, T. Himel, T. Shidara, P. Garbincius, Maura Barone, Kevin Flannery, and David Seigle (summer student, started again on May 27)
Triad: S. Curtis, L. Lew, and K. Long, and
DESY-EDMS: Daniel Szepielak (& Jasper Dammann working on a technical file transfer solution)

During May, I've completed generating all the Cost Estimating Modules (CEMs) and loaded all the RDR estimates into ICET. I've completed the completeness, accuracy, and risk checks for the non-CFS CEMs and elements. I still have to do these for the CFS full summaries. After that, I have to add the background comments, documentation, and links to all the CEMs. An up-to-date graphical status sheet is at:

<http://www-ilcdcb.fnal.gov/RDR-ICET-Status.pdf>

I've compiled a list of 7 issues or problems with ICET that I've forwarded to Triad for their suggestions on how to remedy. All of these are unexpected (at least on my part – maybe I'm just doing something incorrectly), but they are either non-reproducible (re-submit exactly again and it works fine) or have straight forward (but more labor intensive) work-arounds. Triad is starting to work on the remedies.

CLIC-ILC Cost & Schedule Working Group:

G. Riddone, Ph. Lebrun, K. Foraz, F. Lehner, J. Carwardine, T. Shidara,
and P. Garbincius

Philippe and Peter submitted a common CLIC-ILC poster/paper on “Assessing Risk in Costing High-Energy Accelerators” which was presented by Philippe at IPAC-2010 in Kyoto in May, 2010 (WEPE021) Peter posted both the paper and the PowerPoint for the poster as ILC-NOTE-2010-054. Philippe will also post as a CLIC-NOTE.

<http://ilcdoc.linearcollider.org/record/27936/> - for access to the full ILC-NOTE

<http://ilcdoc.linearcollider.org/record/27936/files/ILC-NOTE-2010-054.pdf?version=1> – for paper only

http://ilcdoc.linearcollider.org/record/27936/files/Poster_IPAC2010_Kyoto.pdf?version=1 – for poster

Peter proposes that a separate longer ILC document be prepared adding this extra background information to the IPAC contents (work for the future – will add to ILC-NOTE-2010-054 package).

There was no CLIC-ILC Cost & Schedule Working Group webex meeting this month, but Philippe sent,

“CLIC cost estimate: we are gradually uploading data, but we will not have the complete picture before the autumn. I could summarize where we stand in our next webex meeting, as you suggest on Friday 18 June.”

Other news:

Dean Hoffer reports that the ILC-GDE contract for external hosting of Primavera was let on May 21, and implementation & training of the local Fermilab admin begins the last week of May. Now we have to identify some GDE technical experts to get involved with schedule development for the TDR! (submitted by Peter Garbincius)