

ILC-SCRF WebEx Monthly Meeting

March, 10, 2010

Agenda

1. Report from PMs
2. Report from Group Leaders
3. Discussions
 1. ILC-10 (GDE Beijing Meeting) Agenda

Report From PMs

- SCRF Technical Area: Plan in 2010
 - S2: FLASH workshop at DES: Feb. 22 – 24,
 - Feb-PM monthly report March 5, 2009
 - ILC-10 (GDE) meeting at Beijing: March 26 – 30,
 - Next, PM-March monthly April 5, 2010
 - Next ILC-GDE SCRF webex meeting, April 7, 2010
 - TTC meeting at Fermilab: April 19 – 21,
 - ILC-PAC at Valencia: May 12 – 13,
 - Cavity Industrialization meeting: May 23,
 - IPAC at Kyoto: May 24 – 28,
 - S1-Global test (cooling) start: June 2010
 - Next AAP (main subject SCRF) Summer, 2010 ?
 - Preparation need to start

AAP Comments/Recommendations

SCRF

SRF progress and strategy for gradient decision

The SRF gradient was not the key topic for this meeting. The AAP hence only made a few observations and suggestions. An in-depth discussion of SRF may take place at a later stage.

The AAP acknowledges the good progress on the S0 goals. The AAP is pleased to see a clear definition of TDP I process yield.

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The results on improving the process yield are encouraging for Technical Phase I goals, although there is still a long way to go. To continue to make progress, it would be helpful to understand the nature of the present yield limitations, for example by comparing the yield limitations due to field emission versus yield limitations due to quench at the various gradient levels for the usable data. If it is mostly due to field emission, then the cleanliness during preparation and assembly needs to be addressed. If it is mostly due to quench, then material and fabrication issues deserve focus of future attention.

If the few degradations observed during re-processing are due to field emission, it is less serious than degradations due to a new quench because the cause of the new field emission is understood to be a fault in the preparation. But if a re-processing degradation is due to quench, then it raises the more difficult possibility of a material defect exposure with increased depth of material removal or worsening of a small pit, etc.

There now exists a proof-of-principle for the S1 goal of 31.5 MV/m. This is very encouraging. A study should be made to compare vertical and horizontal test cavity gradient preservation. There exists good data on some DESY cryomodules, 5, 6, 7 etc. This should give some basis for future sorting strategies to maximize the average operating CM gradient, coupled with excess RF power.

There also has been progress on S2 which was not reported. This should not be ignored.

The gradients for the cavities going into the S1 global module are respectable, but the realistic goals of the S1 global activity have not yet been clearly described. The AAP made such a request in the previous report.

The issue of maintaining the plug-compatibility option for the long-term (ILC production, assembly, installation...) has not been touched upon. It would be good to put this issue to rest by having a review of experts as recommended in previous AAP reviews.

Based on the continued progress in gradients for S0, S1 and S2, there is no reason to change the gradient specification at this stage. This issue can always be re-visited if and when exciting results from LHC push the ILC to the forefront.

SCRF: PM Monthly Report

- Due Date: 5th in every month
- Authors: each subgroup leader
- Contents: monthly activity report
- Length: 1/3 ~ 1/2 pages, each
- Addendum: Monthly WebEx Meeting Minutes

- Kind cooperation will be much appreciated.
 - Draft to be sent to Maxine:

Outline: SCRF Monthly Report February, 2010

- Each Group Report
 - Major progress
 - Topical event
 - Plan

Status in January Report



Project Managers' Report

January, 2010

ILC Global Design Effort

Project Managers' Report

From the Project Management perspective, January has been dominated by the review of the SB2009 proposal by the Director's Accelerator Advisory Panel (AAP). The review was held from the 5-6th January in Oxford, UK. The complete agenda and presentations can be found on [Invenio](#) here. The review was in-depth and well-attended, not only with respect to the GDE presentations, but also from the perspective of the AAP, who had had only a few weeks to digest the SB2009 proposal report submitted to the GDE Director late in December. Consequently the sessions were detailed question and answer sessions that clearly focused on the technical issues of SB2009. As a result, the meeting has been extremely useful, and the Project Managers would like to thank again the AAP members for their time and effort to make the review so productive.

Not unexpectedly, while positively embracing the ADI process, the AAP took issue with several of the details of the current proposal. Concerns were raised over the potential impact on the physics scope, which clearly requires better discussions with the Physics & Detector communities. The Project Managers are currently re-assessing the immediate risks associated with SB2009 elements. One clear result of the review will be a more formal 'verification matrix' process to bring each of the SB2009 elements to conclusion within TD Phase 2. This will clearly require closer dialogue with the physics and detector groups. This has been a challenge in the past, but it is clear that better efforts need to be made in the future.

In the near future, technical R&D on the SB2009 baseline elements will continue, although they will not formally become baseline until after successful 'change control'. The focus now is in refining the studies and understanding better the our trade-offs, in addition to additional risk-mitigating R&D associated with the proposal.

On the more technical side, another important milestone in January was the successful installation of the DESY and DfM cavities for the C1-Global High-velocity study at KEK, Japan. The work represents a very successful collaboration between the three laboratories. Teams from both DESY, DfM and KEK worked together to assemble the string and make initial test-checks in the KEK clean-room. Thanks to careful planning and the professionalism of all involved, the work went exceptionally well with few problems. Next steps will be to install the cavity Apsion (Felsvar) and finally the warm couple assemblies (March) through the cryomodule assembly process with further participation from INFN.

The ILC and CERN Design Groups have held a workshop on Low Emittance Rings from 12-13th January. The workshop was open not only to the linear collider community but also to SRF sources which form parts of some issues. The workshop was well attended and identified many opportunities for closer collaboration between the two communities. One important result is that the ILC vertical emittance specification of 2pm has now been achieved in a [few lab sessions](#).

Status: January Report

- 1.1 Cavity
- 1.2 Cryogenics
- 1.3 Cryomodule
- 1.4 HLRP

In the past month, we helped finalize the main linac chapter of the SB2009 report and worked with the civil and coating groups. We continued preparations for the klystron cluster large circular waveguide tests. We consulted with the vendors fabricating the "big pipe" sections (received February 1) and the CTO mode launchers, meanwhile proceeding with in-house fabrication of support frames and other components and preparing the experimental area. We also initiated shipment of a pair of VTO's (variable tap-offs) to KEK for incorporation in the S1 Global installation waveguide system. We are producing U-bend waveguide phase shifters for an alternate local power distribution layout which allows remote adjustment of power division. These will be included in the waveguide system for Fermilab's second NML cryomodule and could be adopted in the ILC.

- 1.5 Main Linac Integration

ML-SCRF WebEx meeting Minutes

Draft: Minutes of ML-SCRF Technology Meeting (100113)

Date & Time:

14:03-14:55 GMT, January 13, 2010, via WebEx.

Participants:

R. Geng, C. Ginsburg, Y. Yamamoto, H. Hayano, N. Ohuchi, S. Fukuda, A. Yamamoto, M. Ross, J. Kerby, J. Carwardine, W. Bialowons, N. Toge, R. Kephart, R. Rimmer, T. Shidara

Presentation files are available at the following Indico site:

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=4380>

1) Reports from Project Managers

- **Report of AAP (M. Ross, A. Yamamoto)**

Marc thanked everyone for their contribution to complete the SB2009 document and for their participation in the Accelerator Advisory Panel (AAP) Review held last week at Oxford. (Presentation files of this AAP Review were posted at <http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=4253>.) AAP members reviewed the proposal more deeply than they did last May and their written comments will be available in a few weeks. Just after the meeting the PMs distributed a note, listing their initial (very preliminary) thoughts on AAP comments which were presented at the close-out, which is necessary for preparing agenda and works for efficient discussions at the coming GDE meeting in Beijing. Jim commented that preparation for the agenda and necessary participants should be done as soon as possible for necessary travel arrangement just prior to the spring break season.

- **SCRF Meeting plan in 2010 (A. Yamamoto)**

The dates for future SCRF WebEx Meeting plan were discussed and tentatively decided. (Feb. 10, March 10, Apr. 7, May 5 (??), June 2, June 30 (?); these will be fixed soon.)



Global Plan for SCRF R&D

Year	07	2008	2009	2010	2011	2012
Phase	TDP-1			TDP-2		
Cavity Gradient in v. test to reach 35 MV/m	→ Yield 50%			→ Yield 90%		
Cavity-string to reach 31.5 MV/m, with one-cryomodule		Global effort for string assembly and test (DESY, FNAL, INFN, KEK)				
System Test with beam acceleration			FLASH (DESY) , NML (FNAL) STF2 (KEK, extend beyond 2012)			
Preparation for Industrialization				Production Technology R&D		



ILC Cavity Field Gradient

to be re-evaluated toward TDP-2

- Balance between R&D target values and Operational parameters
Will be reviewed after S1 experience
- System design should require reasonable margin for the individual component and the system operation

S1 (~ Component performance) > ILC-Acc. Operational Gradient

	RDR/SB2009	Re-optimization required with cautious, systematic design	
R&D goal: S0	35 (> 90%)	35 MV/m (> 90 %) <i>Keep it, and forward looking</i>	
S1 (w/o beam)	31.5 in av.	<i>need:</i> > 31.5 in av., to be further optimized	31.5 in av.
S2 (w/ beam acc.)	31.5 in av.	> 31.5 in av.	31.5 in av.
ILC: operational gradient	31.5 in av.	31.5 in av. (+/- 10 ~ 20 %)	<i>or:</i> < 31.5 in av., to be further optimized



Process for the Re-evaluation

- Seek for an optimum balance in 'Gradient'
 - **R&D and Production**
 - **Production (acceptance performance)**
 - Single 9-cell cavity > Single Cryomodule > ILC Cavities
 - An example: $1 > 0.95 > 0.9$
 - $S_0 = 35$ MV/m, $S_1: 33$ MV/m, $S_2: 31/5$ MV/m
 - **Operational Condition**
 - Spread of Cavity Gradient (to be allowed)
 - Cavity Operational Margin and RF Operational Margin
 - Need to wait for S2 R&D (FLASH,)
 - **Plan: We need the re-evaluation, now.**



Agenda in Beijing Meeting

SCRF conveners:

H. Hayano, C. A.>>C. Nantista, C. Pagani

	March 26	March 27	March 28	March 29	March 30
a.m. 1	ALCPG/GD E Joint Plenary	Acc-Phys Joint	Cavity - Gradient research	Cryomod. Cryogen. - S1-Global	GDE Plenary
a.m. 2		Tunnel Layout*			Joint Plenary
p.m. 1	GDE Plenary	HTRF*	Cav. Int. -ILC op. Gradient -Plug Comp.	Industrial.	
p.m. 2		MLI		GDE Plenary	