

# ML-SCRF: Monthly WebEx Meeting

## Dec., 19, 2012

### 1. Reports from PMs

- ILC-GDE SCRF schedule
- Completion of TDR advance draft
- Report from PAC and from the close out

### 2. Reports from TA Group Leaders

- Cavity, Cavity Integration, Cryomodule, Cryogenics, HLRF, ML
  - R. Geng, H. Hayano, P. Pierini, T. Peterson, S. Fukuda/C. Nantista, C. Adolphsen

### 3. Further Actions

- Finalization of TDR: Further check and more references
- Preparation for the External Cost Review

# SCRF: FY2012~13 Plan

月	SCRF WebEx	GDE / International
10	3	8-12: ASC-12 @ Portland 22-26: LCWS @ Arlington 28-29: IEEE-NSS @ Anaheim
11	21	5-8: TTC (JLab) 13-14: GDE Cost Review (Fnal) 14-16: Higgs factory WS (Fnal)
12	19 (today)	13-14: ILC-PAC (KEK) 15: LC Symposium (Tokyo)
	(16)	9, 16, 23, 30 (11, 18, 25, 2/1) External cost-review preparation mtgs. for SCRF
2	14 (Last GDE-SCRF webex)	6-7? External Cost Review (London) 21-22: ICFA/ILCSC (Vancouver) : Transition to the next organization
5		13~17: IPAC (Shanghai) 27-31: ECFA-LC 2013 (DESY)
6		12 ILC Event (KEK, CERN, Fnal) at 5:00 pm
9		22-27: SRF2013 (Paris)
11		11-15: LCWS-2013 (Tokyo)



# TDR Technical Volumes

2007

2011

2013\*

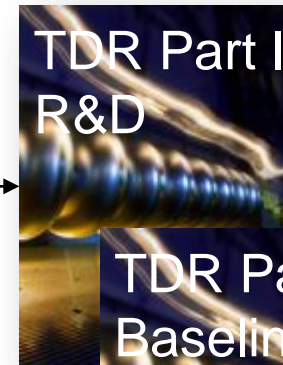


Reference Design Report



ILC Technical Progress Report  
("interim report")

AD&I



TDR Part I: R&D  
~250 pages  
Deliverable 2



TDR Part II: Baseline Reference Report  
~300 pages  
Deliverables 1,3 and 4

Technical Design Report

\* end of 2012 – formal publication early 2013



# General Assembly

- **Vol. 1: Physics**
- **Vol. 2: Accelerator**
  - Part 1: R&D
  - Part 2: Accelerator Baseline Design
- **Vol. 3: Detectors**
  - Common, SiD, ILD

# ILC-PAC Reviewers

held at KEK, Dec., 13-14, 2012

- TD Report (Part II) submitted to the PAC
- Reviewers
  - Jonathan Bagger
  - Jia-er Chen
  - Stefan Choroba
  - Michel Davier
  - [Lyn Evans \(Chair\)](#)
  - Enrique Fernandez
  - Paul Grannis
  - Stuart Henderson
  - Masao Kuriki
  - Tomio Kobayashi
  - Lutz Lilje
  - John Mammoser
  - Wolf-Dietrich Moeller
  - Katsunobu Oide
  - Robert Orr
  - Ray Pillay
  - John Seeman
  - Hans Weise

# ILC-PAC Agenda

## held at KEK, Dec., 13-14, 2012

### Agenda (12/13)

09:00 – 09:45 **Executive Session**  
 09:45 – 10:15 Accelerator Overview B. Barish  
 10:15 – 10:30 **Break**  
 10:30 – 11:15 Machine Design N. Walker  
 11:15 – 12:30 SCRF (Cavity, CMs) A. Yamamoto  
 12:30 – 13:00 **Executive Session**

13:00 – 14:15 **Lunch**

14:15 – 14:45 ML layout M. Ross  
 14:45 – 15:15 HLRF S. Fukuda  
 15:15 – 15:30 **Break**  
 15:30 – 16:00 Source W. Gai  
 16:00 – 16:30 Damping Rings G. Dugan  
 16:30 – 17:00 BDS K. Buesser  
 17:00 – 18:00 CFS Kuchler/ Enomoto  
                                   KCS RF system C. Adolphsen  
 18:00 – 19:00 **Executive Session**

### Agenda (12/14)

09:00 – 09:15 Detector Overview S. Yamada  
 09:15 – 09:45 ILC Physics M. Peskin  
 09:45 – 10:05 DBD Introduction J. Fuster  
 10:05 – 11:00 DBD Common I Lohrmann, K.  
 Buesser, C. Clerc  
 11:00– 11:15 Break  
 11:15 – 11:30 DBD Common A. Miyamoto  
 11:30 – 12:30 SiD White/ Barklow

12:30 – 13:40 Lunch

13:40 – 14:40 ILD Y. Sugimoto  
 14:40 – 15:10 IDAG M. Davier

15:10 – 16:10 **Executive Session**  
 16:10– 17:00 Closeout

# From Close-out, for TDR and SCRF

## from notes by Marc Ross, A. Yamamoto

- TDR, General:
  - This was the main purpose of the review. Can the committee support the TDR? Where is it weak?
  - In general the committee was satisfied with the presentations, apart from KCS.
  - The biggest piece was the SRF. Enough progress was made that the TDR can be seriously be defended.
  - The gradient range is well within reach and in this way the project is in much better shape than the LHC was when it was approved.
  - It should now profit enormously from the industrialization of the XFEL. And should not stop there as there are areas that need further attention. The foremost of these are tuner and the power coupler.
  - For the coupler, an important statement was made: It seems the Toshiba coupler was rejected because it was too expensive. However, work on the Toshiba coupler well organized (with rigid cold-end outer pipe) should be continued and the cost-effective production to be realized.

# From Close-out

## Stefan Choroba

- Content concerning the HLRF. It is in good shape. Many aspects are similar to the XFEL. ILC uses the same tubes and will also benefit from the E XFEL technical approach. The Marx is a different type of modulator and there is a need to operate it for more time. In principle this is basic advice. For the waveguides used in DKS there are no major concerns. Some power distribution components should be tested. Overall DKS is a good solution.
- There are concerns with KCS. The scheme is very attractive and would be very interesting if it would be in a textbook. There are several points that need review. What happens in case of a breakdown? This needs investigation. Are we sure that you can align the system so that you have no conversion into other modes? This needs more investigation. The high precision that many components need should be proved. It is not clear how to test the feasibility of the whole system. Lastly, the LLRF system for DKS looks similar to that of FLASH. It is not clear how it works for KCS. (There was no LLRF presentation.)

## Lutz Lilje

- KCS energy balancing has to be looked at. The TDR has nothing about this. (I think he meant adjusting the distribution between cryomodule 'ML units'.)
- The cavity gradient target is within reach. Satisfactory cavity production by other manufacturers has been demonstrated. A sustained effort is needed to make sure that the new vendors don't forget things. Just a cautionary statement. Cavity preparation procedures have to stabilize (chemistry). Also the approach for selection of the data has to stabilize in order to harmonize the data and process. Cryomodule assembly is a problem as has been discussed several times.
- There is a need for more investment into module assembly. ILC will get experience from DESY / E XFEL. But this will remain an issue. New, alternate shapes have been demonstrated. HOM suppression needs to be studied for the new shapes. (is this true?).
- The E XFEL will give a good data point for the tuners, including the motor. There are several options. The overall tuner integration effort has to be discussed.



# From Close-out

## Wolf-Dietrich Moeller

- Power coupler development. Cost should not be the only argument - the Japanese coupler must therefore be included. The cost is not so much more - especially if produced in quantity. The port diameter is a very important parameter.
- A different port diameter can be allowed if we adopt the idea that we have compatible designs only for one region. In that case it is not necessary to specify the interface at the coupler port. The Toshiba (Japanese) coupler has to have a larger coupling range.

## Hans Weise.

- There is quite some agreement among us (DESY (and other) members of the committee). We exchanged and summarized our findings. The cold linac technology is ready. We do not see fundamental flaws. Needed improvements are really technical development.
- The goal must of course be come to the point where you can build it. Industrialization is the most important point. In large series production all the cavities are treated the same and according to the well-defined procedures. The same should true for cryomodule assy. Assembly has to be done according to procedure with no mistakes. All existing modules (cryomodules built to date) are non- standard and include compromises, usually made to stay on schedule. This is not a useful way to establish a production process record. We have to come to the point where there are good statistics. As of now, findings are based on the existing BN analysis. It was surprising to see the span of the costs in the offers for XFEL cryomodule assembly . The main reason was the costing of risk. We found out that the best price was from company who did clean room work. For others - they had a hard time to cost the risk. We have to educate many companies and by this we can save money.
- A key issue is mechanical work in clean rooms - screws in clean rooms – as this is different from semiconductor work. Concerning cavities - mechanical production is not the issue anymore.
- We have new companies who produce good cavities. Cavity preparation in industry is new. The knowledge is still in the labs and now industry has to do it. We have to do more technology transfer for cavity preparation.

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### 3. Further Actions

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# Further Actions

- Final check for text, specially on References
- Visit:
  - <https://forge.linearcollider.org/attachments/download/1585/20121210-TDR1-PAC.pdf>
  - <https://forge.linearcollider.org/attachments/download/1586/20121210-TDR2-PAC.pdf>
  - <https://forge.linearcollider.org/attachments/download/1587/README.pdf>
- Please add, specially, references more adequately.

# Agenda under consideration for External Cost-Review London, Feb. 6, 2013

	Sessions A	Sessions B
am	Executive session	
	ILC design overview (NW)	
	General cost methodology (GD)	
	SCRF Overview (AY) Cavity production study by RI (NW)	
	Lunch	
pm	SCRF Cryomodule assembly study by BNG (VP) Cryogenics (TP)	HLRF (SF and CA)
	Executive session	

# Agenda under consideration for External Cost-Review London, Feb. 7, 2013

	Sessions A	Sessions B
am	Executive session	
	CFS -1	Conventional accelerator systems
	Lunch	
pm	CFS-2	
	Cost summary/roll-up	
	Executive session	

# Preparation for External Cost Review

- SCRF Webex meeting, dedicated for review
  - Jan. 9: Cavity, CM, Cryogenics
  - Jan. 16: RF power system
  - Jan. 23: Cavity, CM, Cryogenics
  - Jan. 30: RF power system and overall check,
- At usual webex time slots.