

SCRF Monthly WebEx Meeting

May 6, 2010

- Reports from PMs (5 min.)
 - Meeting Plan
 - Response to questions given by PAC
 - Industrialization workshop
 - as IPAC satellite meeting, Kyoto, May 23, 2010
- Reports from TA group leaders (each 3 –5 min.)
- Special Discussions (30 min.)
 - TDP-R&D Plan (release 5) and homework
 - 1st draft due May 27, and the final document due June 10,
 - 1st Baseline Assessment Workshop (BAW-1),
 - KEK, Sept. 7 – 10, 2010, and homework

Report from PMs

- SCRF Technical Area (related) Plan in 2010
 - SCRF webex meetings:
 - 5/7, 6/2, 6/30, 7/28, 8/25, 9/22, 10/20, 11/17, 12/15
 - ILC-PAC, (Valencia): 5/13-14
 - TDP R&D plan (release 5) draft due date: 5/27
 - Cavity Industrialization workshop
 - As a satellite meeting of IPAC-10, Kyoto, 5/23,
 - GDE/KEK-LC joint review of CF in mountain region
 - At KEK, 6/1-2,
 - The 1st Baseline Assessment WS at KEK, 9/7-10
 - Single-tunnel HLRF, Accelerating gradient
 - LINAC-10, Tsukuba, 9/13-17

Response to the Question given by PAC

Q2: Question related to SCRF-ML

- How feasible are each of the two RF distribution systems proposed for the single tunnel option?

Response submitted (by PMs)

- We need to understand that the motivation for each RF distribution system has a strong site-dependence in relation to the CFS design, and for this reason, both should be pursued in our future technical design efforts.

Response (continued)

- The Klystron Cluster System (KCS) is feasible, in principle, because it is a passive system in the tunnel. It should be basically identical to the RDR RF distributing system, beyond the general RF distribution line coming down from surface. Having the large RF station with all the active instrumentation being on the surface is an advantage for a flat-land shallow or deep site. The R&D program to demonstrate the RF transmission line is in progress at SLAC to confirm feasibility. A large-scale RF power station with large stored energy may be a next step of demonstration to be considered.
- The principle of Distributed RF System (DRFS) has been practically demonstrated in CEBAF (at JLab) and SNS (ORNL), so is well established. In this view, this option is feasible, and it has an advantage for a mountain site to minimize big construction of the RF station and transmission line in the mountain region. The feasibility of the layout, installation and repair-work in tunnel are practical R&D subjects and two prototype DRFS klystrons are under development to be examined in the S1-Global cryomodule tests at KEK, and it has been included in the experimental plan. A further long term test is planned to be realized in 'Quantum Beam Project' in which two 9-cell cavities are to be operated by using on DRFS klystrons for longer term demonstration (~ half year or more). Therefore, the feasibility of the DRFS system with underground tunnel layout shall be experimentally verified at KEK by 2011. The radiation hardness and control/tuning capability with large amount of HLRF/LLRF equipment in the tunnel are another subjects to be overcome.
- In parallel to the above efforts, we are planning to organize the 1st Baseline Assessment Workshop (1st BAW) to discuss 'Single Tunnel HLRF' system to be held at KEK on Sept. 7-8, 2010. We are inviting physics/detector groups and external experts to participate and discuss and evaluate the technical feasibility. It will give us appropriate advice and confirmation of feasibility.

Industrialization Workshop as a Satellite meeting of IPAC

Final Announcement for a Workshop on
'Superconducting RF Cavity Technology and Industrialization for the ILC'

May 23, 2010, from 9h00 – 17h30
Kyoto International Conference Center (Room 157)

URL: http://ipac10.org/index_Main.Venue

The objective of the workshop is to understand the current status of SCRF Cavity R&D and to learn from laboratory and industrial partners the technical needs and inputs required to develop an optimum model for industrialization of the ILC.

An outline of the agenda is below, with speakers, registration form and a detailed agenda available at:

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

Agenda

09:00->09:35 Introduction

09:00 Opening Remarks (15')

Akira Yamamoto (KEK, ILC-GDE)

09:15 Current Status of SCRF Cavity development (20')

Rongli Geng (Jefferson Lab)

09:35->10:30 Industrialization Experience at European Laboratories

09:35 European XFEL cryomodule production model and status (20')

Olivier Napoly (CEA/Saclay)

09:55 CERN Industrial Experience with LHC Construction (35')

Philippe Lebrun (CERN)

10:45->12:15 Laboratory Plans in the American and Asian Regions

10:45 American Region Laboratory Plans (45')

Bob Kephart (FNAL)

11:30 Asian Region Laboratory Plans (45')

Hitoshi Hayano (KEK)

13:15->15:30 Industrial Experience / Studies / Advice

13:15 European industrial experience with large international projects (30')

Wolfgang Walter (Babcock Noell)

13:45 From Americas region (1h00')

* Industrial studies of ILC cavity and component production in the Americas (30')

Tony Favale (AES)

* The interim US market for SCRF accelerator technologies (30')

Ken Olsen (SPAFOA)

14:45 From Asian region (45')

* Industrial studies with Japanese industries (25')

Eiji Kako (KEK)

* Efforts with the Advanced Accelerator Science/Technology Association (20')

Michitaka Ono (AAA)

16:00->16:30 Nb Material Supply

16:00 Industrial comments on the material requirements for the ILC (30')

Hiroaki Umezawa (Tokyo Denkai)

(TBD: Comment from Henkel)

16:30 General Discussion (45')

All

17:15 Summary (15')

Jim Kerby (FNAL)

17:30 End

A Review on Design Study of the ILC Conventional Facility in Mountain Regions to be held at KEK, June 1 – 2, 2010

1. Objectives of the Review :

- Conceptual design co-work by KEK LC-CFS and AAA CE-WG,
- Consistency with ILC-GDE CFS design guideline for SB2009/TDP-2,
- Work-package plan for civil engineering (CE) design to be executed at KEK

2. Organization of the Review, managed by

- A joint effort of GDE-CFS and KEK-LC
- Both (Marc Ross and Seiya Yamaguchi) will receive review report and recommendations.

3. Review Committee Members

- Review Chair : Vic. Kuchler (GDE-CFS: FNAL)
- Review members: John Osborne (GDE-CFS: CERN)
Tom Lackowski (GDE-CFS: FNAL)
Wilhelm Bialowons (GDE-CFS/GS-APM: DESY)
Satoru Yamashita (U-Tokyo)
TBD: more engineers/engineers (to be assigned by the Chair),
TBD: researchers/experts
(to be advised by S. Yamashita, from Japan Society of Civil Engineer)
- Review secretary: Akira Yamamoto (GDE/KEK/AAA)

Agenda

June 1, 8:30 ~

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|-----------------------------------------------------------------------------------------------------------------------|-----------------------|
| - Review Committee closing session; | Chaired by V. Kuchler |
| - Open Session: (9:00 ~: Chaired by V. Kuchler) | |
| 1. Welcome address: | A. Suzuki |
| 2. Review work requirements (to make sure): | A. Yamamoto |
| 3. Introduction for CE work in mountain regions: | A. Enomoto (KEK/AAA) |
| - Boundary conditions and guidelines for design work. | |
| - General Progress in design study, | |
| 4. Reports from Conceptual Design Study Team (AAA Civil Engineering WG)
in cooperation with KEK | |
| - Concepts of civil engineering in mountain region | M. Yoshioka (AAA/KEK) |
| - Major components: layout and constraints: | |
| Cryomodule | H. Hayano (GDE-KEK) |
| HLRF | S. Fukuda (GDE-KEK) |
| Cryogenics | K. Hosoyama (GDE-KEK) |
| - Individual Design works | |
| (to be orally presented by M. Miyahara, and assisted by
AAA engineers (from member companies) with their comments) | |
| - General CE layout: | Shikama (AAA-CE) |
| - Accelerator main-tunnel : | Ryoke (AAA-CE) |
| - Sub-tunnel and access: | Sasao (AAA-CE) |
| - Detector-hall: | Akojima (AAA-CE) |
| - Underground-Water handling: | Takeuchi (AAA-CE) |
| - Cooling-water and utilities: | Kokubo (AAA-CE) |



R&D Plan Release 5

Some ideas for discussion

Nick Walker

PM Meeting 19.04.2010

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Five Themes to Develop

Remains special case

Industrialisation
in-kind
contribution
models

**SCRF
Technology**

- Regional expertise, global Industrialisation
- Average accelerating gradient
- Cost (cryomodule, mass-production models)

**R&D
(General)**

- Sources
- DR (e-cloud)
- BDS / MDI

Site
requirements

AD&I (CFS)

- Consolidation of baseline(s)
- Design choices (parameters, layout etc.)
- Design work (documentation)

Project
Schedule

**Cost &
Schedule**

- ICET (schedule tool)
- Traceable, defendable
- Justification

Remaining
Technical
activities

TDR Risk

- R&D (and engineering) beyond 2012
- Impact (design, cost, schedule)
- Mitigation (fall-back solutions)

>2012

**Project
Implementation
Plan**



TDP R&D Plan, Release 5

To be updated, due June 10, 2010

Table of Content (proposed):

1. Purpose of this document: Introduction
2. Overview of Technical Design Phase 2
 1. Top-level management goals and milestones for the TDP-2
- 3. Superconducting RF Technology (Akira)**
4. Accelerator System R&D (Marc)
5. Accelerator Design and Integration (Nick)

6. Updating the Value Estimate (PHG)
7. Developing A Risk Assessment for the TDR (TBD-Ewan?)
8. Producing the Project Implementation Plan (TBD-Mike)
9. Global GDE Resources (TBD)

Section 3: SCRF Technology

Homework required due May 27

1. Achieving (assessing) the average accelerating gradient
 - >> Cavity gradient &D: R. Geng and Cavity G.
 - >> Cavity gradient yield evaluation: C. Ginsburg and data base team
 - >> Accelerating Gradient, System Design: A. Yamamoto and PMs
2. Towards a global cryomodule design, S1-Global, and plug-compatibility
 - >> H. Hayano, N. Ohuchi/H. Nakai, T. Peterson and Cavity Int. , Cryomodule, Cryogenics G.
3. System integration testing ('string tests')
 1. FLASH (DESY) : >> J. Carwardine/M. Ross
 2. NML (Fermilab) >> TBD
 3. STF (KEK) >> H. Hayano et al.,
4. Development of high-level RF solutions
 - >> S. Fukuda, C. Nantista and HLRF G.
5. Main Linac Integration
 - >> C. Adolphsen and MLI G.

R&D Plan (Rel. 5) Schedule

- May 7: SCRF-ML webex and homework assignment
- May 27: 1st full draft to be gathered at PMs
- June 10: EC and the draft to be signed-off
- June 17?: FALC and R&D plan (rel. 5) to be reported,

Remark

- R&D plan (rel. 5) should be #1 priority by June 10,
- BAW and other works will be prepared after R&D plan completion,

1st BAW Announcement

distributed, May 3, 2010

- Date: Sept. 7 – 10, 2010
- Place: KEK
- Subjects:
 - Single tunnel HLRF systems (Sept. 7 – 8)
 - Accelerating gradient (Sept. 9-10)
- Announcement
 - Distributed to GDE mailing list including physics/detector executive members,
- URL and Indico Agenda including registration
 - To be prepared in cooperation with GDE secretariat and KEK LC-office,

Subjects to be discussed

Single tunnel HLRF systems

- KCS
 - Tolerance on RF amplitude and phase within a cluster
 - Operational margin of RF power, and tuning and control strategy
- DRFS
 - Assembly, sorting, and installation strategy including tolerances
 - R&D requirement in TDP including radiation shielding
- Backups
 - Ordinal RF system in RDR, in single tunnel, as the final backup

Subjects to be discussed

Accelerating Gradient

- Strategy for gradient **improvement** (R. Geng, H. Hayano, and collaborators)
 - Material, fabrication, surface process, instrumentation & repairing,
 - Strategy to overcome ‘quench’ and ‘field emission’,
 - Improvement of gradient and successful production yield,
- Strategy for accelerating gradient in ILC (Experts TBD and A. Yamamoto)
 - Overview of the production yield progress and prospect including gradient spread
 - Specification of Gradient, Q0, emitted radiation, resulting in cryogenic load, in the cavity vertical test,
 - Specification for cryomodule test including cavity/cryomodule operational margin
 - Specification in beam acceleration, including RF and beam operation margin
 - Strategy to control ‘emitted radiation’
 - Strategy for tuning and control including tolerances and availability margin, (<< advices from R.
 - Impact on other accelerator system CFS, RF cryogenics and cost,

Preparation for the 1st BAW

- May 7: SCRF webex meeting and homework assignment
- June 2: SCRF webex meeting and progress report from each collaborator,
- June 30: SCRF webex meeting and preliminary draft report to be distributed
- July 28: SCRF meeting and draft report to be distributed,
- Aug. 25: SCRF meeting and the final report (prior to the 1st BAW) to be distributed