SCRF WebEx Meeting
2009-3-18

1. **Report from PM and Group Leader**
2. **TILC09-AAP Review Preparation**
3. **TILC09 Parallel Session Agenda**

Report from PMs

- **Visiting SCRF cavity manufacturers, completed, and many thanks for everyone's cooperation**
  - AES, Niowave in AMs US)
  - ACCEL, ZANON in EU
  - MHI in AS (Japan)
- **Preparation for AAP Review**
  - General agenda fixed,
  - Parallel session agenda need to be fixed soon,

Report from GLs

- **Cavity Gradient R&D: Lutz**
- **Cavity Integrataion: Hitoshi**
- **Cromodule: Norihito**
- **Cryogenics: Tom**
- **HLRF: Shigeki**
- **MLI: Chris**

AAP Review – SCRF

Draft Agenda and Report Format

Feb., 20, 2009

Revised, March, 6, 2009

Re-revised, March 18, 2009

AAP Review General Agenda

	17(Fri)	18(Sat)	19(Sun)	20(mon)	21(Yue)
9			ATF	AS	Joint Summary
	ACFA-GDE Joint	CFS			
10			SRF		
11					
12					
13					
14		CESRTA	SRF	MM	
	AAP Guidance				
15				PM summary	
		FLASH			
16					
	AAP Closed Session				
17					

The AAP TDP1 Interim Review

- **While the AAP review is not closed, attendance is limited due to space constraints (according to the request by Barry).**

- **Participation of those not directly involved in the proceedings (i.e. those who are not either panel members, speakers or organizers) is limited to 'observers' only.**

- **Virtually all of the GDE Technical Area Group Leaders have been asked to present material to the review and the times of their presentations must the taken into account in the organization of the parallel sessions. This means that, on average, there will be less time available for parallel sessions than there has been at previous GDE meetings.**

Parallel Session

- The primary goal of the TILC09 parallel sessions is to present and discuss R & D and design activities now in progress in order to bring the latest results to the GDE community. .
- We expect the parallel sessions to also focus on the re-baselining process (to be completed by early 2010). Many (but not all) of the re-baselining proposed critical decisions have been listed in the 'Minimum Machine' initiative).
- We would like to ask parallel session conveners to help guide the re-baselining process by:
- 1) providing a forum for stakeholders to give input;
- 2) collecting their input and developing a summary for the Project Managers and for the TILC09 closing plenary; and
- 3) evaluating current status and recommending and organising further studies as proactively as possible.

Parallel Session (continued)

- **The parallel sessions at TILC09 effectively launch the 2009 ILC re-baselining process. The key re-baselining activities and milestones are listed here:**

- **1) Collecting input from the community - starts at TILC09**
- **2) Submitting preliminary recommendations - next GDE meeting (ALCPG09 - late September 2009)**
- **3) Reviewing and approving recommendations - February 2010**

- **At TILC09 there will be a special parallel session on Accelerator Design and Integration (co-convened by Nick Walker and Ewan Paterson), which will focus on many of the re-baseline options and in particular on the optimization of the central injector complex. All group leaders affected by this discussion are expected to participate. To avoid any potential conflict with the AAP review and other parallel sessions, this special joint session is scheduled for 16:30-19:00 on Saturday 18.04.**

AAP Review Context for SCRF

Context	Charge	Note
What is the path to finalizing the gradient choice? -Current Experimental status - Established standards, and Extrapolation of results - Role of “plug-compatibility”, - Time limitation and Decision Proces	L. Lilje M. Champion H. Hayano R. Geng	S0
What is the path toward industrialization? - Current experimental status - Established standards, and extrapolation of results - Internationalization of efforts, -Outline tendering process - Role of Plug-compatibility	N. Ohuchi H. Hayano M. Campion	S1/S 2
Lesson expected from system test - FLASH at DESY (operational limitation of ILC cavities) - STF at KEK, time-line and benefit - NMF at FNAL: time-line and benefit	 TBD H. Hayano M. Champion	S2

SCRF Report Agenda

Time	Report	Peported by	Note
09:00	Introduction	A. Yamamoto	
09:10 09:00 09:40	Path to finalizing cavity field gradient - R&Ds to improve the gradient - Decision process	 L. Llje A. Yamamoto	S0
9:50 09:50 10:20 ( ) 11:20	Path towards industrialization - Cavity Integration - Cryomodule -Coffee break - Role of plug-compatibility	 H. Hayano N. Ohuchi A. Yamamoto	S1/S2
11:30 11:30 11:45 12;00	Path towards industrialization (cont.) - Cryogenics - HLRF - MLI: Beam Dynamics and Quadrupoles	 T. Peterson S. Fukuda C. Adolphsen	To be discus sed
12:30	Lunch		
14:00 14:00 14:30 15:00 15:30	Lesson expected from system tets - STF - NMF Summary and Discussions (all subjects) Adjon	 H. Hayano M. Champion A. Yamamoto	S2

SCRF parallel session

SCRF Parallel Sessions at TILC09								
Apr. 17 (Fri)		Apr. 18 (Sat)		Apr. 19 (Sun)		Apr. 20 (Mon)		
		9:00		8:30		9:00		
					AAP Review		Joint with CFS	
		12:00		13:00		12:00		
Lunch		Lunch		Lunch		Lunch		
14:00		14:00		14:30	AAP Review	14:00		
		16:30	Design&Integ	16:00				
18:00		19:00		18:00		18:00		
								Total hrs
4		5.5		2		7		18.5

1) Cavity Gradient R&D (scope for progress in 2009 and re-base line)
Conveners: L. Lilje, H. Hayano, M. Champion,??
2) Cavity Integration, tuner, coupler plug-compatibility
Conveners: H. Hayano,??
3) Cryomodule, S1-Global cryomodule
Conveners: N. Ohuchi,??
4) HLRF, Cluster and Distributed RF source
Conveners: S. Fukuda, C. Adolphsen,?? With CFS
5) MLI, Quadrupole alignment, low-energy cavity alignment
Conveners: C. Adolphsen, K. Kubo?? With LET
*TILC09 LOC reserves one room for SCRF sessions

Agenda updated, April 17

			AAP	CFS	ML	sources	DR	Beam Dyn.	BDS	ACFA
17(Fri)	8:00	Registration								
	9:00	Joint Plen.								
	10:00									
	11:00	Joint Plen.								
	12:00		working lunch							
	13:00									
	14:00		AAP							
	15:00									
	16:00		AAP							
	17:00									
	18:00	Reception								

April 18

			AAP	CFS	ML	sources	DR	Beam Dyn.	BDS	ACFA
18(Sat)	8:00									
	9:00		CFS	X						
	10:00									
	11:00		CFS	X						
	12:00		working lunch							
	13:00									
	14:00		CesrTA				X			
	15:00									
	16:00									
	17:00		FLASH	Design & Integration						
	18:00		Exec							

April 19

			AAP	CFS	ML	sources	DR	Beam Dyn.	BDS	ACFA
19(Sun)	8:00		Exec							
	9:00		SCRF		X				MDI	
	10:00									
	11:00		SCRF		X				MDI	
	12:00		working lunch							
	13:00									
	14:00		SCRF		X					
	15:00									
	16:00		ATF/ATF2				X		X	
	17:00									
	18:00		Exec							

April 20

			AAP	CFS	ML	sources	DR	Beam Dyn.	BDS	ACFA
20(Mon)	8:00		Exec							
	9:00		AS	CFS+ML		X	X	X	X	
	10:00									
	11:00		AS	CFS+ML		X	X	X	X	
	12:00									
	13:00		working lunch							
	14:00									
	15:00		MM							
	16:00									
	17:00		PMsummary							
	18:00		Exec							
		Banquet								

April 21

			AAP	CFS	ML	sources	DR	Beam Dyn.	BDS	ACFA
21(Tue)	9:00	GDE Plen.								
	10:00									
	11:00	Joint Plen.								
	12:00									

Outline of Reports

SCRF

Introduction (A.Y)

- **To be filled**

Field Gradient R&D (L.L.)

- **R&D Current Status**
  - What has been obtained
  - What has been standard
- **R&D Plan in TDP**
  - R&D subjects and what will be expected
  - Time-line
  - Resource
  - Global cooperation
- **Reference Information (to be attached)**

Field Gradient Choice (A.Y.)

- **How to establish the optimum field gradient for ILC**
  - Decision process
  - Time scale

Path to Industrialization Cavity Integration (H. H.)

- **Current Experimental Status**
  - Established standards,
  - Extrapolation or results
- **R&D Plan in TDP**
  - Subjects
  - Timeline
  - Global cooperation
  - Plug compatible condition
    - Functional and physical boundary conditions

- **Reference Information (to be attached)**

Path to Industrialization Cryomodule (N. O. & H.C.)

- **Current Experimental Status**
  - Established standards,
  - Extrapolation or results
- **R&D Plan in TDP**
  - Subjects
  - Timeline
  - Global cooperation
  - Plug compatible condition
    - Functional and physical boundary conditions

- **Reference Information (to be attached)**

ILC Cryogenics Work Package Status and Plans

T. Peterson

17 March 2009

ILC Cryogenics Work Status

- **RDR cryogenic system effort totalled less than 1 FTE for the duration of the RDR effort**
- **Early technical design phase (TDP) work package development (2007) suggested tripling that to 3 FTE's (one from each region) for the duration of the TDP**
- **For the past year (2008) we have had less ILC cryogenics effort than during the RDR**
- **Result -- only a few minor updates to the ILC cryomodule heat load estimates and cryoplant size estimates have been done**

Outlook for 2009

- **In 2008, the scope of funding and resources for ILC limited work to certain critical R&D and planning tasks, mostly not cryogenics.**
  - Cryogenics for ILC is relatively well-understood since we have LHC and Jlab cryogenics as similar systems
  - Issues like cavity processing for consistently high gradient need more R&D attention
- **The 2009 budget outlook indicates that we could get back up to about the RDR level of 1 FTE (1/2 FTE in U.S. plus KEK effort on cryogenics, plus small effort in Europe from INFN and DESY)**

Summary of tasks for 2009

1.4.1.	Heat loads	The heat load to the entire cryogenics system is investigated under static and dynamic conditions. Static, dynamic, and distribution system loads are considered, including tolerances and uncertainties. Overall uncertainty factors and cryoplant sizes are re-evaluated.	Peterson (FNAL), Ohuchi (KEK), Pierini (INFN), Petersen* (DESY)
1.4.2.	Cryogenic process design, cryoplant design, and surface impact	The cryogenics plant engineering is to be carried out in cooperation with industry and in close communication with CF&S technical area engineers to optimize interface with the CFS system. The location and distribution of surface equipment such as large compressors and associated utilities are optimized for minimal local impact, reliability /maintainability and cost. The integrated cycle design is evaluated. Temperature and pressure levels in cryomodules, particularly in the thermal shields, should be evaluated in the context of the full process through the cryoplants.	Klebaner (FNAL), Peterson (FNAL), Arenius (JLAB), Ganni (JLAB), Tavian* (CERN)
1.4.3.	Venting, pressure limits, and piping and vessel standards	The peak pressure in the cryogenics system in various modes of pre-cooling, steady state operation, and emergencies such as vacuum failure and helium rupture into the vacuum should be assessed, along with venting design. Cryogenics system and components need to meet industrial high-pressure gas regulation standards, which includes regional code compliance for hardware manufactured in other regions.	Peterson (FNAL), Nakai (KEK), Hosoyama (KEK), Petersen* (DESY)

Some Project X synergy

- **Although no ILC effort is foreseen for item 1.4.4, below, Project X effort has begun with respect to tunnel arrangements, string lengths, segmentation, and maintenance scenarios which, although for a smaller system, will be relevant for ILC.**
  – Klebaner (FNAL), Peterson (FNAL), Theilacker (FNAL)

1.4.4.	Tunnel cryogenic system design and integration with Main Linac	Design of the cryogenic system arrangement and components within the Main Linac tunnel includes cryogenic distribution design, segmentation, load-sharing, and maintenance scenarios, special 4K to 2K heat exchanger design, and liquid helium level control. Trade-off studies that compare cryomodule complexity and cost for cryogenic system loads.	(on hold, no effort foreseen)

Postponed tasks

1.4.5.	Oxygen deficiency hazard	Safety plan against oxygen deficiency hazard (ODH) in tunnel and surface building is investigated.	(on hold, no effort foreseen)
1.4.6	Cryogenics outside of the main linacs (e+/- sources, damping ring, RTML, BDS)	Cryogenics for e+, e- source linac, undulators, DR, BDS, RTML, and associated distribution and special objects, as unique and separate from Main Linac. The cryogenic engineering should be similar to that of the main linac system, with a smaller scale. These systems must be properly integrated into the ML cryogenics system.	(on hold, no effort foreseen)
1.4.7	Cold vacuum systems	The vacuum systems for thermal insulation in all cryogenics systems in ML, e+/- sources, BDS, RTML are designed in close cooperation with cryogenics system design. The vacuum system for beam pipe is designed as separate system, in this work package.	(on hold, no effort foreseen)

Summary: 2009 work packages

- **1.4.1 Heat loads**
  - Peterson (FNAL), Ohuchi (KEK), Pierini (INFN), Petersen* (DESY)
- **1.4.2 Cryogenic process design, cryoplant design, and surface impact**
  - Klebaner (FNAL), Peterson (FNAL), Arenius (JLAB), Ganni (JLAB), Tavian* (CERN)
  - Jefferson Lab (Arenius, Ganni) will provide assistance
- **1.4.3 Venting, pressure limits, and piping and vessel standards**
  - Peterson (FNAL), Nakai (KEK), Hosoyama (KEK), Petersen* (DESY)
- **1.4.4 Tunnel cryogenic system design and integration with Main Linac**
  - Part of Project X cryogenic effort but relevant to ILC
- *** CERN and DESY effort involves primarily just provision of information from their work on XFEL and LHC.**

Path to Industrialization HLRF (S.F)

- **Current Experimental Status**
  - Established standards,
  - Extrapolation or results
- **R&D Plan in TDP**
  - Subjects
  - Timeline
  - Global cooperation
  - Plug compatible condition
    - Functional and physical boundary conditions
- **Reference Information (to be attached)**

Path towards Industrialization
ML Integration, Quadrupoles (C. A.)

- **Current Experimental Status**
  - Established standards,
  - Extrapolation or results
- **R&D Plan in TDP**
  - Subjects
  - Timeline
  - Global cooperation
  - Plug compatible condition
    - Functional and physical boundary conditions
- **Reference Information (to be attached)**

Role of Plug-Compatibility (A.Y.)

- **R&D Stage**
- **Production Stage**
- **Reference Information (to be attached)**
  - Plug compatible document by PM

Lesson from System Tests FLASH (TBD)

- **Operation Experience**
  - ILC like mode
    - Long bunch
    - High charge
    - High gradient
  - Experience and characterization of implication for ILC

- **Further Plan**

- **Reference Information (to be attached)**

Lesson from System Tests STF (H.H.)

- **General plan**
- **Time line (and Resource?)**
- **Benefits**
- **Reference Information (to be attached)**

Lesson from System Tests NML (M.C.)

- **General plan**
- **Time line (and Resource?)**
- **Benefits**
- **Reference Information (to be attached)**