

# Preparation for DESY Meeting

S.Fukuda

# Agenda (1)

## DESY Linac Meeting Agenda

Time	Talk	Listen	Topic	Speaker(s)
<b>Thursday 11.5 AM</b>			<b>Cost Models and Costing Plans</b>	
9:00	30	15	XFEL costing methodology	Brinkmann
9:45	30	15	TESLA cavity/cryomodule production model	Walker
10:30	30		Coffee	
11:00	10	10	ILC pre-construction, construction, commissioning timeline	Paterson/Garbincius
11:20	40	30	ILC cavity/module production model proposal and costing	Funk / Stanek
12:30			Lunch	
<b>Thursday 11.5 PM</b>			<b>Cost Models and Costing Plans (cont)</b>	
14:00	30	15	RF cost drivers and costing plans	Neubauer / Larsen
14:45	30	15	Tunnel cost drivers and costing plans	Kuchler
15:30	30		Coffee	
16:00	30	15	AC and water cost drivers and costing plans	Lackowski
16:45	30	15	Installation model and costing plans	Asiri / Shidara
17:30				
<b>Friday 12.5 AM</b>			<b>XFEL / ILC Comparison</b>	
9:00	30	15	XFEL RF System	Choroba
9:45	30	15	ILC RF System	Fukuda
10:30	30		Coffee	
11:00	20	10	XFEL Cavity and Cryomodule (TDR differences)	Petersen / Lange
11:30	20	10	XFEL Civil and Cryoplant	Bialowons
12:00			Lunch	

# Agenda (2)

## Friday 12.5 PM

## Cost Saving Possibilities

14:00	10	5	Rough cost model for cavity cost -vs- gradient	Proch
15:00	10	5	Cost savings for cavity mechanical assembly	Reschke
15:15	10	5	Cost savings for cavity preparation	Lilje
15:30	10	5	Cost drivers for cryomodule assembly	Carter
15:45	10	5	Cavity aperture limits from wakefields	Solyak
16:00	30		Coffee	
16:30	10	5	Cost saving with smaller cavity apertures, single crystal	Mammosser
16:45	10	5	KEK ideas for reducing linac costs	Hayano
17:00	10	5	Minimum tunnel diameter	Lackowski
17:15	10	5	Single Tunnel	Bialowons
17:30	10	5	Striped-down control system	Carwardine
17:45	10	5	Stream-lined cooling system	Ross
18:00				

## Saturday 13.5 AM

## Working Sessions

9:00		45	Second iteration of cavity/cryomodule production model	Funk / Stanek
9:45		45	Resolve remaining civil / rf issues	Kuchler / Fukuda
10:30	30		Coffee	
11:00		45	Resolve remaining rf / cryomodule issues	Fukuda / Carter
11:45		45	Resolve remaining rf / controls issues	Larsen / Carwardine
12:30			Lunch	

# One of the parallel session (Klystron R&D)

**On Behalf Of Walker, Nicholas John**

**Sent: Thursday, May 04, 2006 1:21 AM**

**To: Lilje, Lutz; Adolphsen, Chris; N.Solyak; hitoshi.hayano@kek.jp**

**Cc: [rdr\\_mgmt@fnal.gov](mailto:rdr_mgmt@fnal.gov)**

**Subject: DESY Main Linac Meetings**

**“I have two requests for 'parallel meetings'. One is a telecon on klystrons which I believe Lutz is organizing**

**(please send me time and number of participants).”**

Key	depending on	Short Title	Priority	Institute1	Institute2	Status	Full Description
PS_Klystron	PS	Klystron					
PS_Klystron_MBK	PS_Klystron	MBK improvement	very high	DESY	KEK	in progress	Thales (DESY), CPI (DESY), Toshiba (KEK)
PS_Klystron_Alternatives	PS_Klystron	* Alternative klystron designs; the priority of the most promising approach will be raised to "high"	high				
PS_Klystron_MBK_many_beam	PS_Klystron_Alternatives	MBK with many beamlets, e.g. 36	moderate	KEK		undefined	By increasing the beam current with the number of beamlets, the required high voltage can be reduced to several 10 kV.
PS_Klystron_Sheet_Beam	PS_Klystron_Alternatives	L-band prototype of Sheet beam klystron (see * above)	moderate	SLAC		undefined	
PS_Klystron_PPM	PS_Klystron_Alternatives	Periodic Permanent Magnet (PPM) focusing version of 5 MW single beam tube (see * above)	moderate	SLAC		undefined	Efficiency
PS_Klystron_Inductive_op	PS_Klystron_Alternatives	Inductive Output tubes (see * above)	low				Proposed by CPI for better efficiency. Could be interesting if MBK program fails.

## Content of the presentation for the “ILC RF System”

- Specification relating with TESLA TDR
- ✓ Configuration Based on the BCD
- ✓ Where is the same specification with and where is the different point from TESLA BCD.

Specification table clarifying the deference between the  
ILC and TESLA

- Explanation of the each items using the drawing, table etc. in accordance with the slide 6.
- I am not clear image to present about the cost estimation with the relation of the talk “RF cost drivers and costing plan” of Neubauer/Larsen.

Progress: What is determined/ consented / not determined

Items which is important for cost estimation of RF BCD

- CF relating issues
  - Tunnel Diameter
  - Layout of the components
  - Numbers of penetration holes
  - Size of penetration holes
  - Cooling Issues (Heat loss table)
- Modulator
  - Layout, Power supply issues, Repetition control
- Klystron
  - BCD Klystron; Status of vertical mbk and perspective of horizontal mbk
- Power Distribution System
  - Layout of the waveguide in penetration hole
  - Layout of the waveguide near to the klystron
  - Layout of the waveguide to cryomodule
- Protection, Safety, Control, Sub rack assembly
- WBS

Beyond the BCD: ACD Issues important for cost estimation

# CF relating issues

- Tunnel Diameter
  - Two tunnels configuration-----consensus
  - Both tunnel diameters are 5m.-----determined?
  - Tunnel separation is 7.5m.-----determined? 5m is still alive?
- Layout of the components
  - Recent layout of CF group drawing
  - still numbers of rack and their spaces are not clarified
- Numbers of penetration holes-----3 holes-----fixed?
  - one for 3 WGs, one for power cables, one for SG cables
- Size of penetration holes
  - 17" (min) for WG penetration, other holes diameter?
  - depend on numbers of cables
- Cooling Issues (Heat loss table)
  - Heat loss table (need to refine and fixed)
  - Big issue is heat loss of the klystron power
  - allow for the no rf drive power → all beam power to heat loss
  - consider only the case with rf drive power.-> roughly only 40% is OK

# Modulator

Layout, Power supply issues, Repetition control

need the materials from Chris J. and others.



# Klystron

## Klystron

BCD Klystron; Status of vertical mbk and perspective of horizontal mbk

We can not get the enough information about the mbk.  
We can not easily order the mbk from vendor (ex. From Toshiba, due to the agreement between the vendor and the corporation).

Collaboration for the horizontal mbk is also limited.

It is necessary to discuss about the strategy with DESY.

For cost estimation, we have to assume the completion of the basic design of horizontal klystron.

# Power Distribution System

- **Layout of the waveguide in penetration hole (almost fixed)**

Joints of 3 waveguides penetrate the hole are welded and water channels are also welded. Both ends of the waveguides are also connected to E/H bends by welding.

Numbers of welding points are depends on the distance of the two tunnel separation.

- **Layout of the waveguide near to the klystron**

General agreements have obtained. Still a few points to check exist; power variation range of the hybrid tuning button If we use it instead of variable attenuator; methods of setting the klystron assembly and interference problem with the waveguide components.

- **Layout of the waveguide to cryomodule**

General agreements have obtained for the linear power distribution based on the BCD near to the cryomodule. In this BCD configuration, we assume to use the 3-stub tuner as the phase shifter and use the circulators. Whole waveguides system is pre-installed on the cryomodule, so it is possible to adjust the rf property before installing. Relative configuration of the cryomodule and egress in the beam tunnel is under discussing.

More advanced layout (which is in the category of the ACD) may be necessary to reduce the cost of the power distribution and/or to have a function of the sophisticated control of the Qex.

# Protection, Safety, Control, Sub rack assembly

For protection, safety, interlock and control, I need the information from others.

(from Richard?)

For sub-unit rack assembly, it is necessary to refine the table which I made before.

I waited for the last telephone meeting summary of John Carwardine. Is it uploaded to somewhere?

I want to clarify the number of the rack (details of 16 racks or can we eliminate some of them?)

# ACD Issues

- It may be beyond the current issues for the DESY meeting, but I think it is necessary to start studying the ACD issues on modulator, klystron and power distribution.
- Parallel session of the klystron ACD is one of the triggering issue.
- PDS study eliminating the circulators is also important. Some ideas are proposed by Chris N. and Sergey Kazakov.

# Others

- Please inform me if there are other materials I should present at the DESY meeting.