ML-SCRF: Monthly WebEx Meeting
May 30, 2012

1. **Reports from PMs**
   - GDE activity and meeting plan
   - KILC-12 Summary: (A. Yamamoto)
   - ILC-PAC and recommendations (M. Ross)

2. **Reports from TA Group Leaders** (if any?)
   - Cavity, Cavity Integration, Cryomodule, Cryogenics, HLRF, ML

3. **Special Discussions on**
   - Re-naming to identify better Flat-land or Mountainous conditions/parameters (N. Walker / A. Yamamoto)
   - Progress in TDR Drafting (J. Cawardine / N. Walker)

ML & SCRF Action/Meeting Plan (2012)

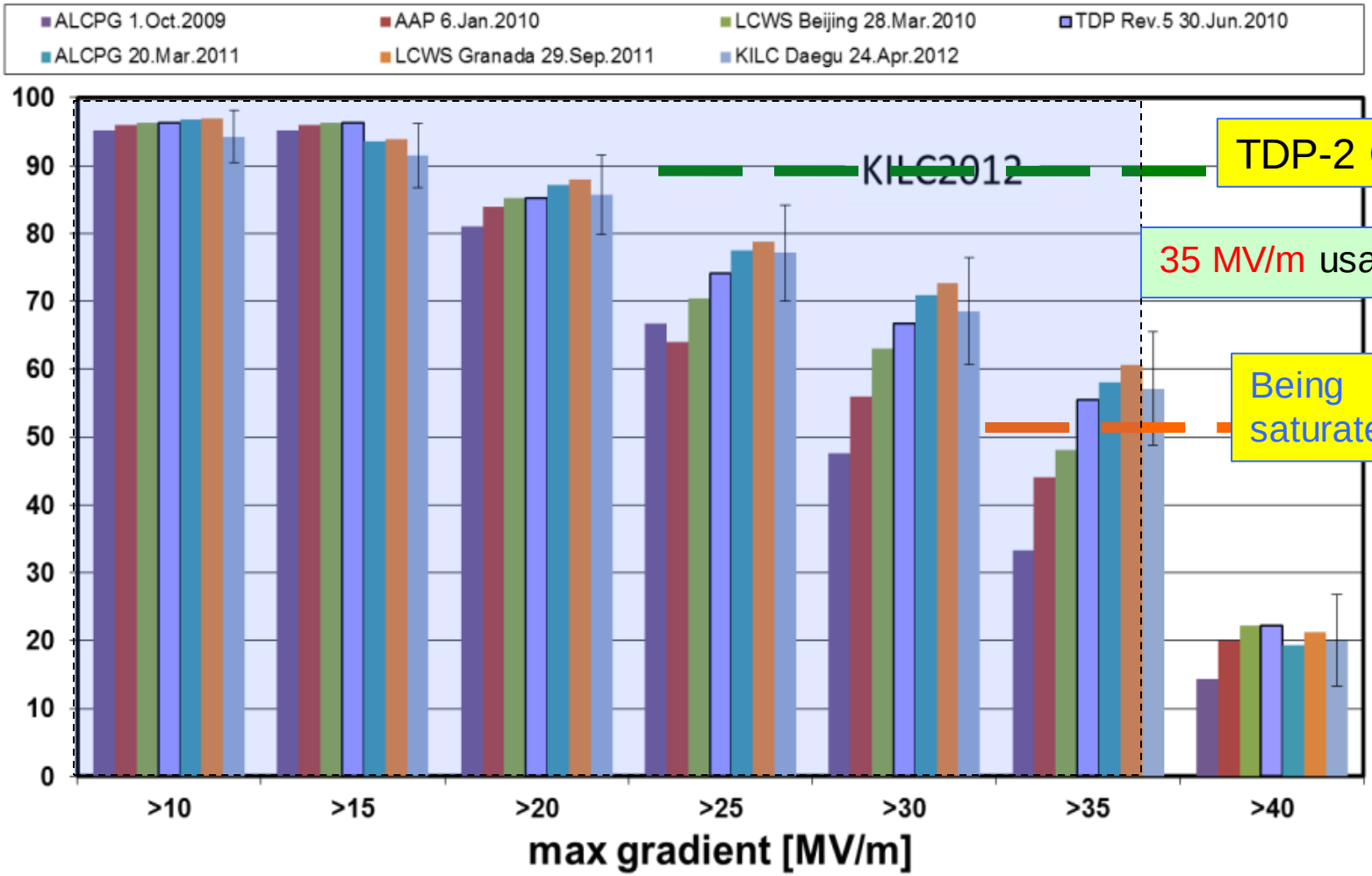
Month	Day	Place	Meeting
April	4 23-26	WebEx Korea	ML-SCRF Monthly meeting (Check homework) ACFA-LCWG : KILC-12 S1-Global report (draft) TDR drafts and cost-study reports, required
May 	15-16 21-25 30	Fermilab New Orleans	ILC-PAC IPAC ML-SCRF Monthly meeting
Sept.	10-14	Telaviv	Linac-2012
Oct.	22-26 29-30	Texas Annaheim	LCWS IEEE-NS (LC event)
Nov.	5-6 15	JLab	TTC Final Draft of TDR
Dec.	13-14	KEK	ILC-PAC

Progress Integrated in Cavity Gradient Yield

Updated, April., 24, 2012

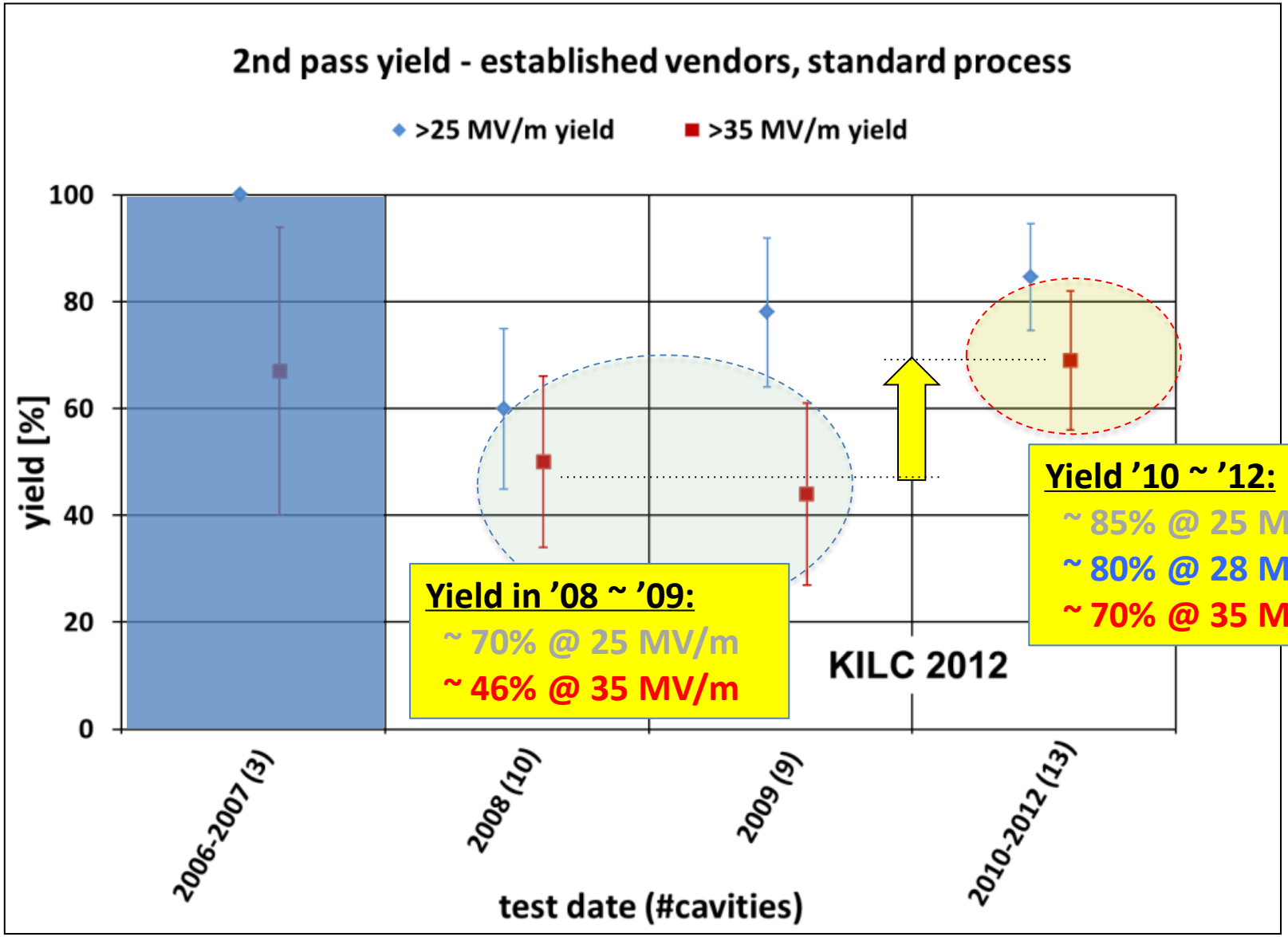
Plot courtesy
Camille Ginsburg of FNAL

Electropolished 9-cell cavities /KEK (combined) up-to-second successful test of cavities from established vendors

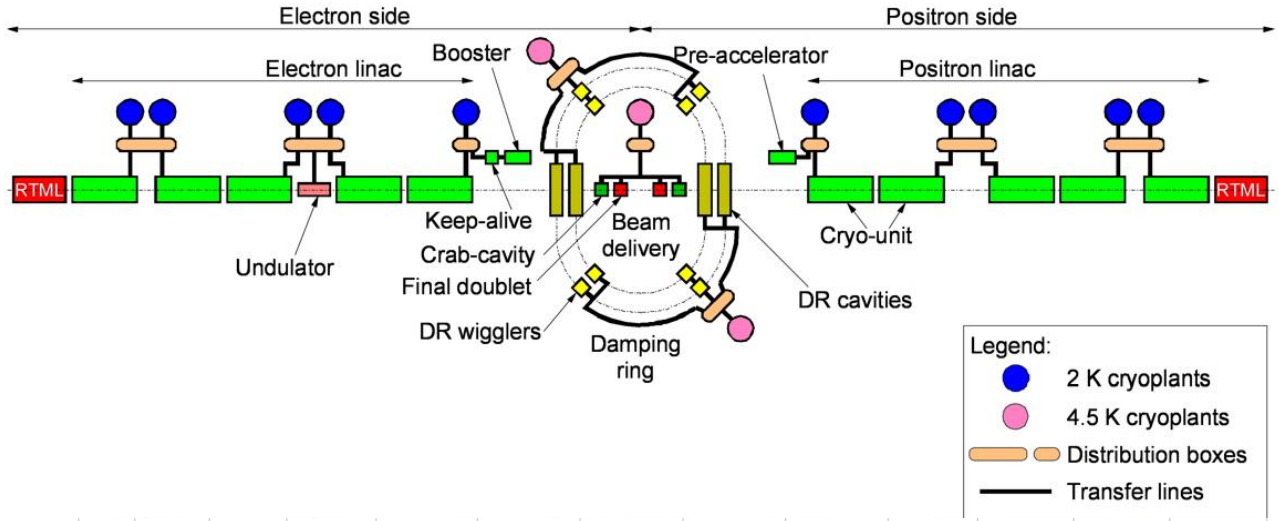


Yearly Progress in Cavity Gradient Yield

as of April 24, 2012



RDR cryogenic layout, for reference



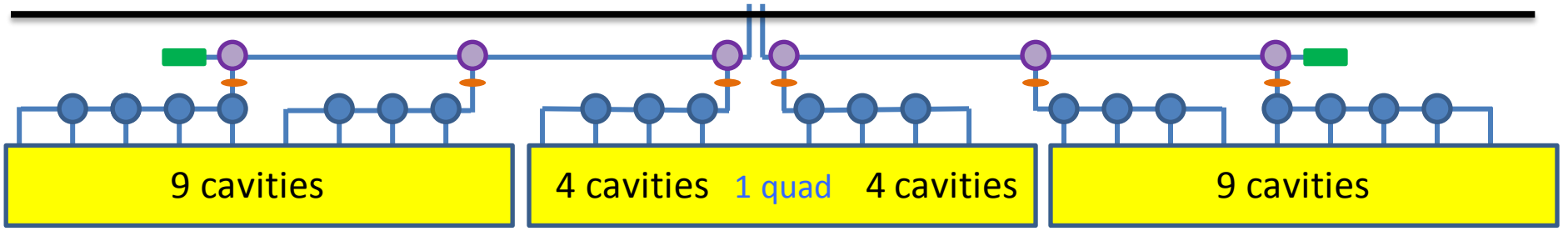
modules			without quad	with quad	without quad			RF unit							
RF unit (lengths in meters)			12.652	12.652	12.652			37.956	(lengths in meters)						
			three modules												
			RF unit	RF unit	RF unit	RF unit	end box	standard string (4 RF units)							
string (vacuum length)			37.956	37.956	37.956	37.956	2.500	154.3							
			four RF units (12 modules) plus string end box												
			or, three RF units (9 modules) plus string end box					short string (3 RF units) 116.4							
	warm drift space	service end box			x N		service end box	warm drift space	service end box						
Main Linac Cryogenic Unit (CU)	7.652	2.500	N strings				2.500	7.652	2.500	strings	etc. . . .				
			12 modules plus one end box per string x N strings												
			(One service box replaces a string end box.)												
	Std cryogenic unit length = N x string length + 2.5 =		2471.7					12.652	(set as module slot length)						

Streamlined PDS

– pressurizable, 0-100%, phase stable
– non-press., limited range
– pressure window
– 5 MW load

Unused power can be dumped to the loads

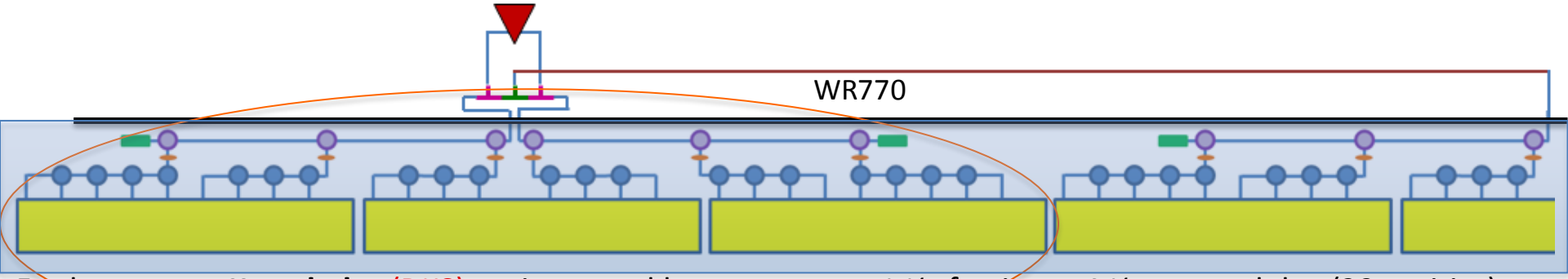
Power to ½ CM's fully adjustable without affecting phases.



phase shifter on each feed, as well as isolator, bi-directional coupler, and flex guide.

RF UNIT: 3 cryomodules (26 cavities)

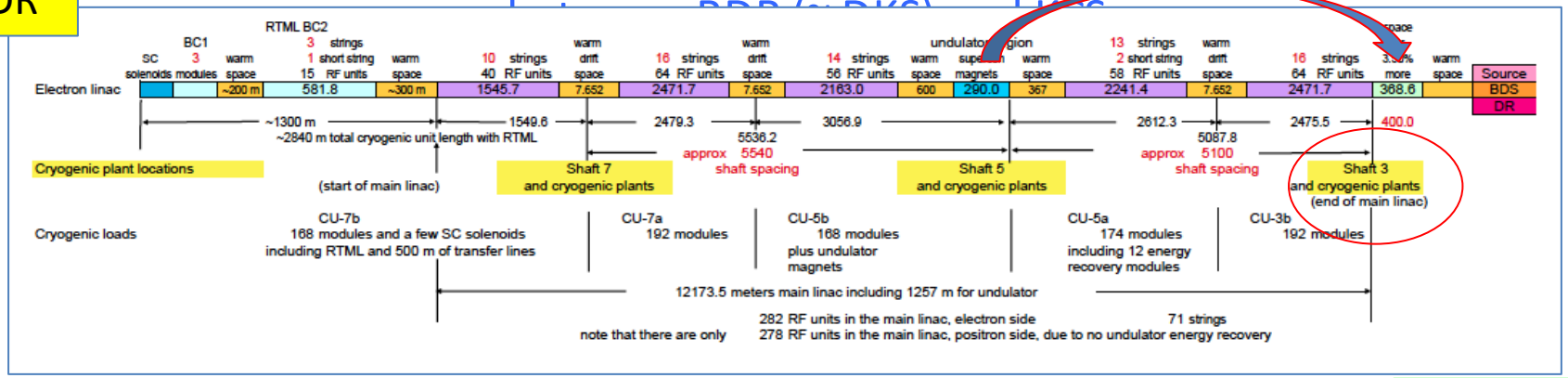
Common Local power distribution



For low power **Kamaboko** (DKS) option, one klystron powers 1 ½ rf units or 4 ½ cryomodules (39 cavities).

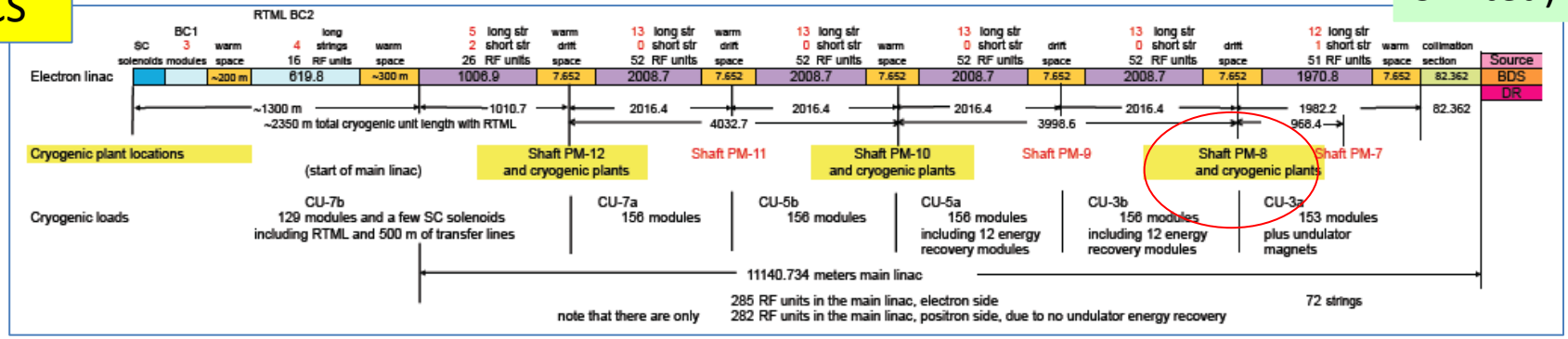
Cryogenics Unit Difference

RDR



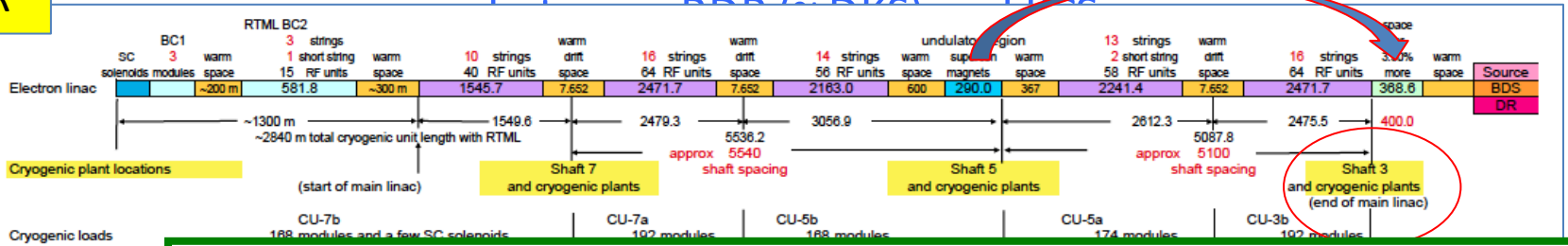
KCS

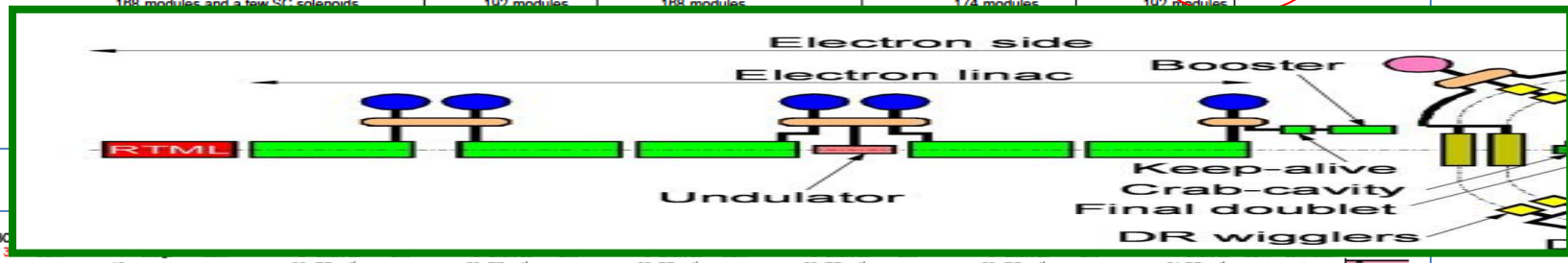
Shifted)



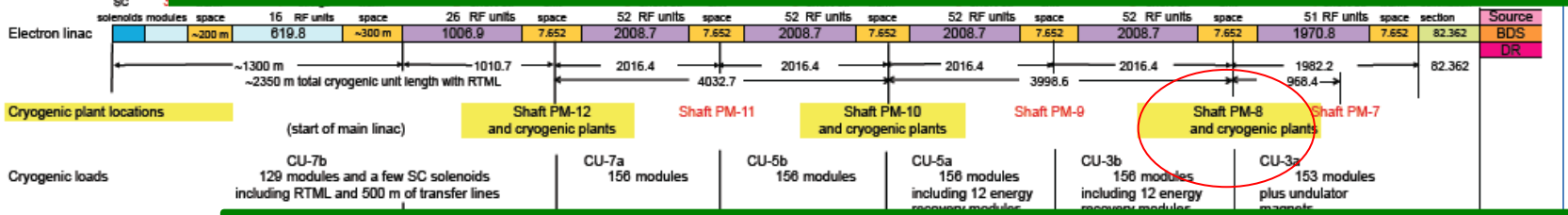
Cryogenics Unit Difference

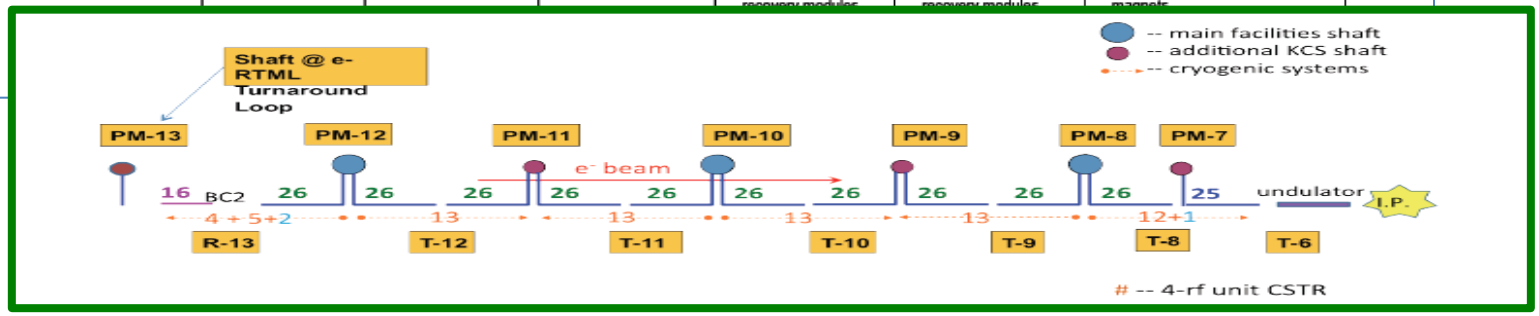
RDR





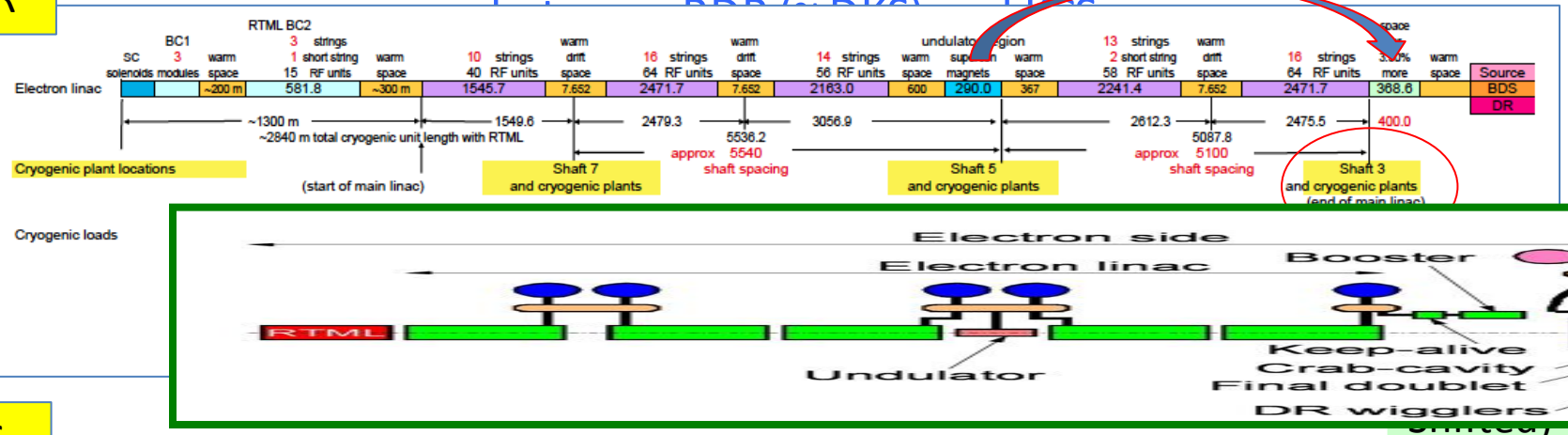
KCS



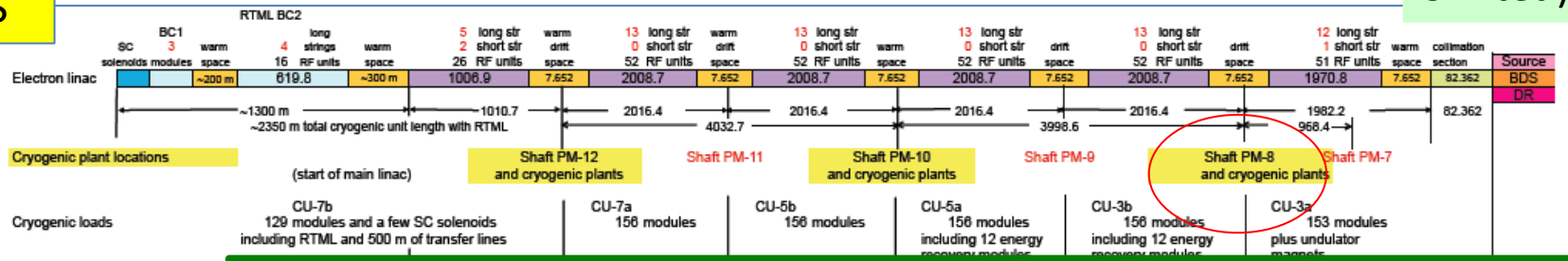


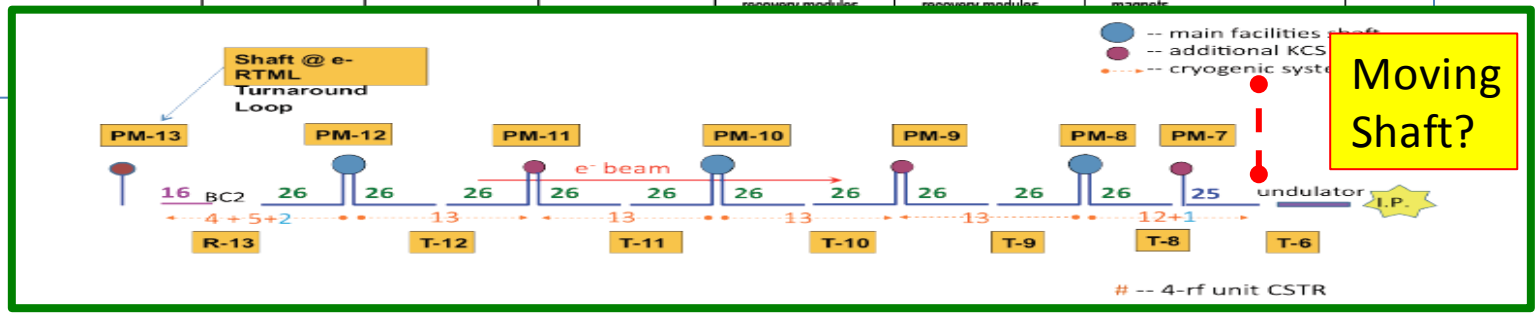
Cryogenics Unit Difference

RDR



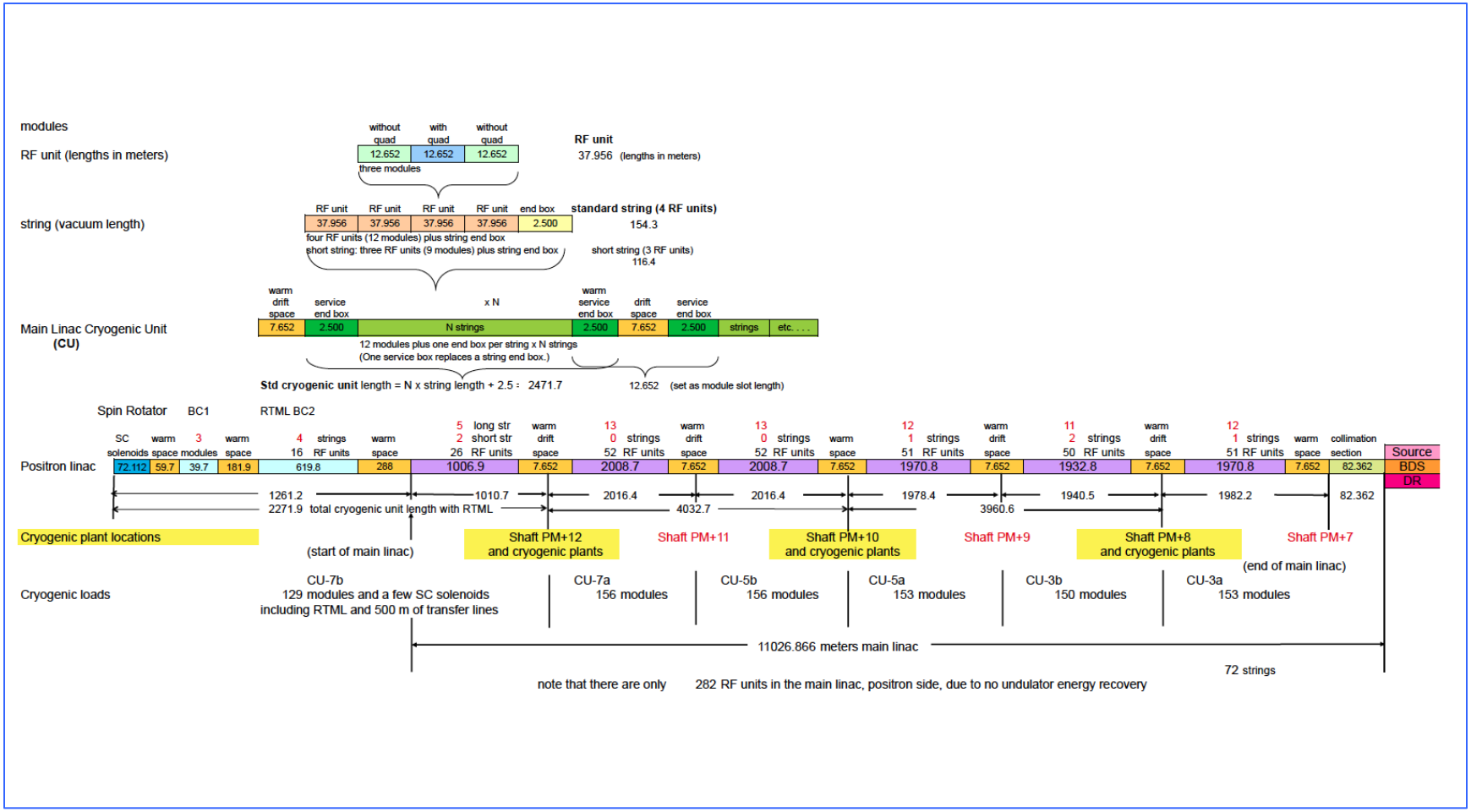
KCS



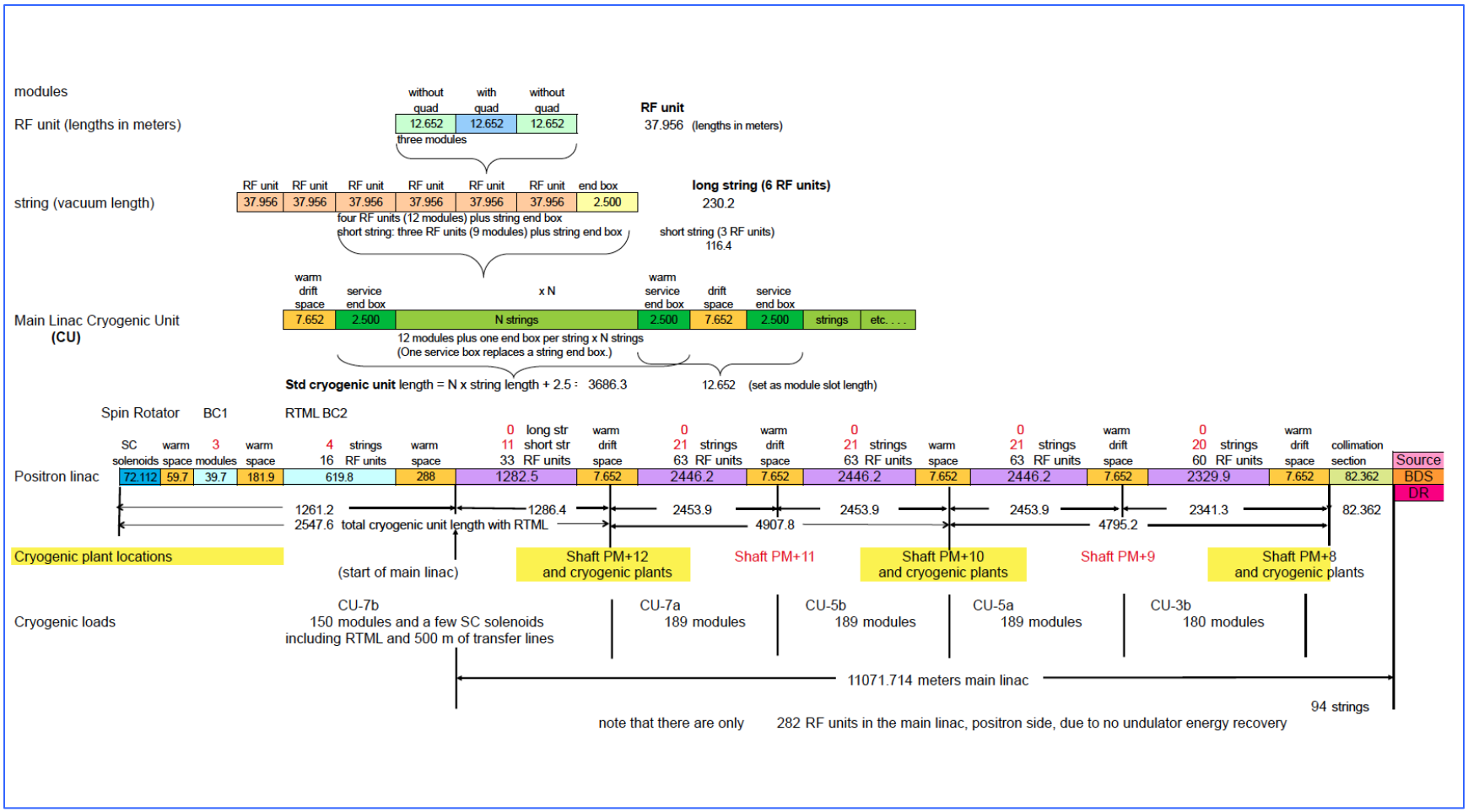


Moving Shaft?

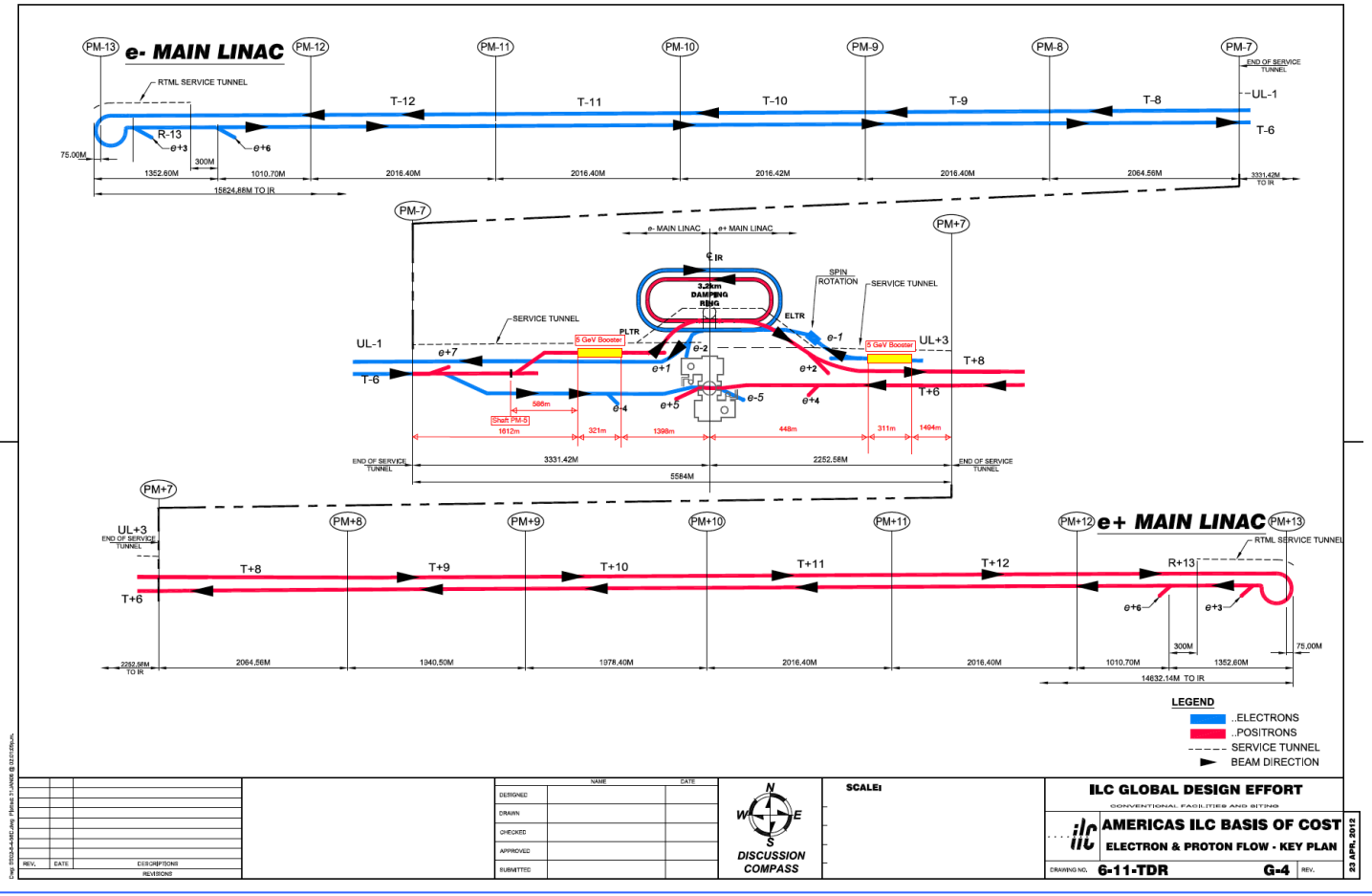
KCS-ML Cryogenics Unit Layout



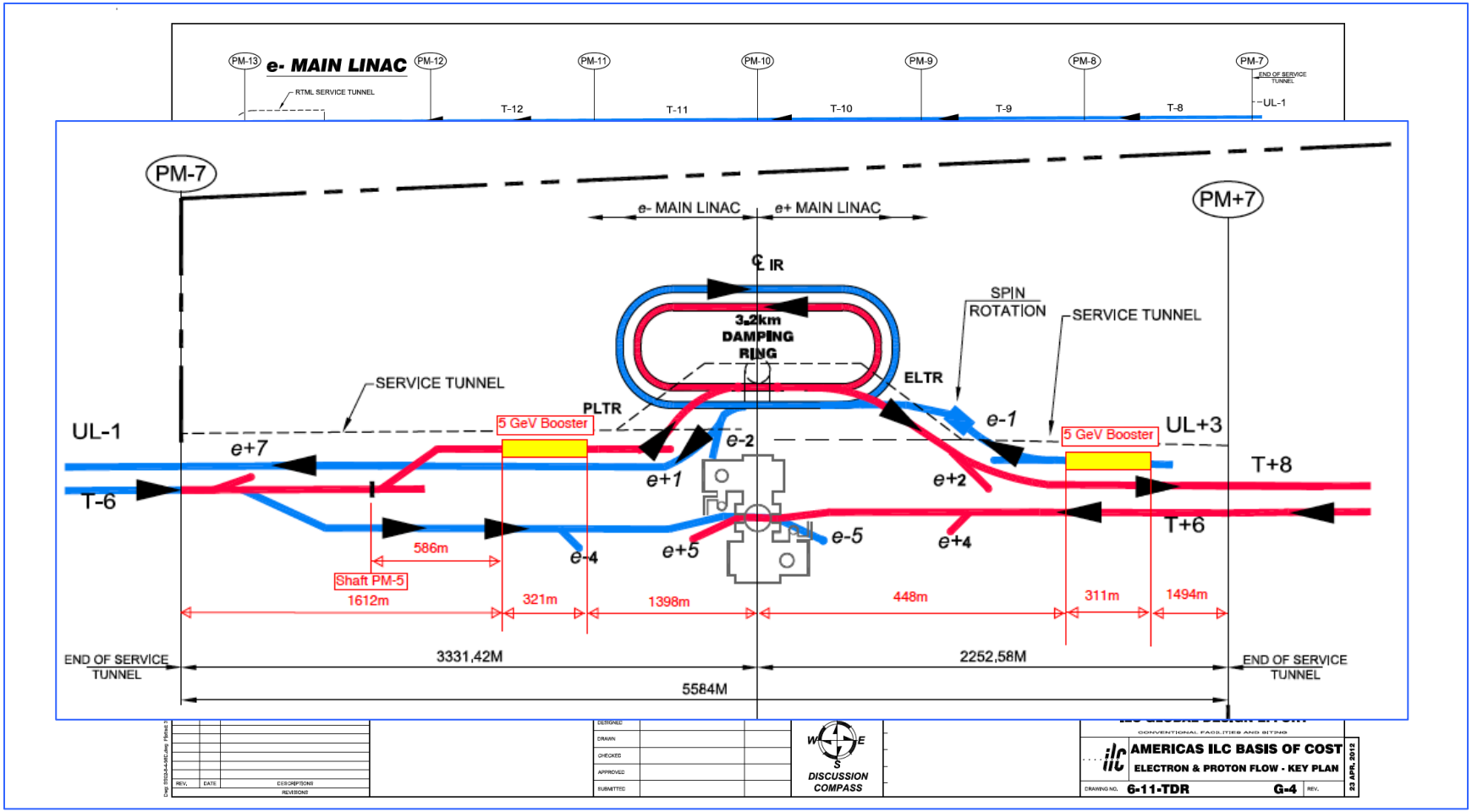
DKS-ML Cryogenics Unit Layout



Central Region Layout



Central Region Layout-2



Cryogenics Dedicated Meeting

- Central region cryogenics layout and configuration to be discussed in a webex meeting
- To be held
  - 18:00, May 31 at Fermilab
  - 8:00, June 1, KEK

- Topic: ILC Central Region Cryogenics Date: Friday, June 1, 2012 Time: 8:00 am, Japan Time (Tokyo, GMT+09:00) Meeting Number: 752 751 028 Meeting Password: crcryo Host Key: 903881 (use this to reclaim host privileges) ---------- To join the online meeting (Now from mobile devices!) ---------- 1. Go to https://ilc.webex.com/ilc/j.php?ED=165488187&UID=0&PW=NMTU1YmU2MGU2&RT=MiM0OQ%3D%3D 2. If requested, enter your name and email address. 3. If a password is required, enter the meeting password: crcryo 4. Click "Join".

Re-naming requested in TDR

advised by N.W

FLAT top. (ML KCS)	MOUNT top. (ML DKS)	
ML Unit	ML Unit	Three module unit CM9-CM8Q-CM9
RF-26 Unit	RF-39 Unit	CTO/Klystron distribution

Cryo short string	3xML unit (9 cryomodules)
Cryo long string	4xML unit (12 cryomodules)
Cryo unit	

Note the bunch compressors have the same configuration for both site flat and mountainou

BC1	3x C8Q1
	1x RF-24 Unit
BC2	16x ML Units
	16x RF-26 Units

Summary

- **ILC accelerator technology**
  - SCRF cavity gradient progressing toward 35 MV/m,
  - Beam test facility functioning to demonstrate the ILC accelerator requirements,
- **Technical Design Report (TDR)**
  - Contents being settled w/ flat and mountainous cases,
  - Draft being submitted by each author,
  - Final draft due LCWS-12, Oct., 2012
- **Further work beyond TDR**
  - Advanced R&D for 1 TeV upgrade capability,
  - Further study to be readh for various energy operation

- *Many thanks for the KILC12 organizer*

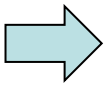
PAC
Summary and Recommendations

1. The PAC feels that the GDE work is progressing well, and will lead to a valuable, high quality, TDR; keeping up the momentum afterwards is recognized as being significantly more difficult.
2. The R&D still needed is in general aligned with the needs of the major labs, particularly DESY and Fermilab. A concern is that R&D on high-gradient cavities, particularly in the US, may not be supported at the ILC-needed level.
3. Currently, the cavity yield at goal gradient is ~ 80%, rather than the desired 90%. The PAC encourages continued R&D on this after submission of the TDR.
4. The Committee is concerned that cavity tuners have not reached the ultra-high level of reliability required for the ILC; the PAC recommends more study and a focused program to achieve the necessary reliability.
5. The need to work on design for a mountainous topography site as well as a relatively flat site is being handled by the GDE as well as can be expected, and needs to continue to TDR completion.
6. It is important to maintain the DESY cavity database, and the Committee appreciates DESY's support of this.
7. The FLASH and CesrTA studies have been of very high quality, and are essential to the design of the ILC.
8. The PAC is impressed with the costing effort, which appears to be using all available information. Based upon LHC experience, the Committee advises not to use a single vendor for any large production order, even if the single-vendor price is lower than using multiple vendors.

Publication and Review

First-draft sections	*** 23 April ***
Complete edited draft	22 October (ILCWS 12)
Final draft (for PAC)	15 November
PAC review	15-16 December

Formal publication at Lepton Photon Conf. (SF, June 2013)



Expect international reviews:
Both technical and cost (Q1-22 2013)

Summary of ML and SCRF BTR

(being uploaded to SCRF meeting Indico Agenda)

Summary of Decisions from Main-Linac and SCRF Baseline Technical Review (BTR)

held at KEK, January 18 – 19, 2012
Reported by GDE Project Managers (PMs):
Akira Yamamoto, Marc Ross, and Nick Walker

Attendance:
C. Adolphsen, M. Akemoto, B. Barish, J. Carwardine, G. Dugan, E. Elsen, A. Enomoto, B. Foster, S. Fukuda, R. Geng, H. Hayano, M. Hronek, E. Kako, S. Kato, J. Kerby, N. Kobayashi, R. Kriske, K. Kubo, V. Kuchler, M. Kumada, T. Lackowski, B. List, T. Matsumoto, S. Michizono, M. Miyahara, K. Nagai, C. Nantista, E. Paterson, P. Pierini (webex), T. Peterson (webex), M. Ross, T. Saeki, M. Satoh, T. Shidara, T. Shirakata, T. Tajima, R. Takahashi, T. Tauchi, N. Toge, K. Ueno, N. Walker, S. Yamaguchi, A. Yamamoto, M. Yamanaka, K. Yokoya

Decision Summary:

The Main-Linac and SCRF Baseline Technical Review (BTR) was organized to discuss baseline design and technology for the Technical Design Report (TDR) and its associated cost-estimate.

Homework by KILC

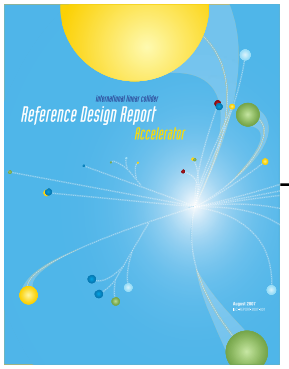
ML Integration	- Provide a complete ML lattice with 9+4Q4+9 cryomodule unit, - Confirm requirement of energy overhead (1.4%) w/ additional ML length for operational availability (provide rationale) - Fix total numbers of CM including ML, RTML, e-source (# add. CMs to be fixed) - Q + corrector +BPM package design (w/ energy dependent design?) - Plan for full power upgrade at 500 GeV, and scenario up to 1 TeV (→ such as quad. configuration, FDFD up to 500 GeV, and FFDD at 1 TeV?
HLRF	- Required RF power overhead, more detail (in KCS and RDR) - Cost saving of PDS, Klystron, Marx Generator etc - Catalogue local power distribution variants and conceptual designs - Estimate waveguide losses and heat loads
CM and Cryogenics	- Confirm CM slot length to be fixed: 12,652 mm in RDR, and it need to be reflected to the current ILC-CM drawing which has currently 12,644 mm (11794+850) in FNAL-CM4. - Asses the need for accessibility and maintenance of active components (tuner motors) - Cryo-string length, additional length of Cold-box for phase-separation, to adapt new RDR-like RF unit and/or tilting tunnel and effect on add. Total main linac length.
Cavity Integration	- Cavity-slot length to be well established (to be 1326.7 mm) - Feasibility of magnetic shield inside LHe tank at central region and outside at inter-connect.
Cavity Gradient	- Update fabrication process and recipe; re-definition of production yield (documentation)
Coupler processing	- Determine specifications for peak power processing - Evaluate solution for tunnel in-situ processing

TDR Technical Volumes

2007 2011 2013*

ILC Technical Progress Report (“*interim report*”)

AD&I



Reference Design Report

~250 pages
Deliverable 2

~300 pages
Deliverables
1,3 and 4

Technical Design Report

More discussed by J. Carwardine
On Jan. 20, tomorrow

* end of 2012 – formal publication early 2013

Logistics

Ch	Sect	Heading	Pages	Primary
		PART I: ILC R&D in the Technical Design Phase	280	
1		Introduction	10	Walker
2		Evolution of the ILC design in the Technical Design Pha	10	Walker
3		Superconducting RF technology	95	Yamomoto
4		Beam Test Facilities	70	*[Editor]*
5		Accelerator Systems R&D	70	*[Editor]*
6		Conventional Facilities and Siting Studies	10	Kuckler
7		Post-TDR R&D	10	Ross
8		Summary	5	Walker
		Part II: The ILC Baseline Reference	338	
1		Introduction and overview	5	Paterson
2		General parameters and layout	15	*[Editor]*
3		SCRF Main Linacs	50	Yamomoto
4		Electron source	10	Sheppard
5		Positron source	20	Gai
6		Damping Rings	25	Guiducci
7		RTML	20	Solyak
8		Beam Delivery System and MDI	25	Seryi
9		Global Technical Systems	26	
10		Commissioning, Operations, and Availability	15	Ross
11		Conventional Facilities and Siting	42	Kuchler
12		Upgrade options	20	*[Editor]*
13		Scope of post-TDR engineeting (tech. risk assessment)	20	Ross
14		Project Implementation Planning	20	Harrison
15		Cost and Schedule	20	Dugan
16		Summary	5	Walker

There are too many chapters to spend 3hrs on each, so we will need to prioritize

Which authors are going to the meeting?

TDR Writing Status reported by J. K

ILC TDR - Issues

#	Project	Subject	Content Author	Editing status	% Done	Promise date	Status rep date	Comment
TDR1 - Beam Test Facilities (6)								
224	TDR1 - Beam Test Facilities (6)	Section: ATF2	Toshiaki Tauchi	Not received	0	07/31/2012	05/22/2012	
206	TDR1 - Beam Test Facilities (6)	Section: Quantum Beam experiment	Hitoshi Hayano	Not received	0			
205	TDR1 - Beam Test Facilities (6)	Section: Fermilab/NML beam facility	Mike Church	Received by Forge Upload	0			
204	TDR1 - Beam Test Facilities (6)	Section: CesrTA and electron-cloud R&D		Not received	0			
203	TDR1 - Beam Test Facilities (6)	Section: FLASH '9mA' Experiment	John Carwardine	Not received	30	06/08/2012	05/29/2012	
202	TDR1 - Beam Test Facilities (6)	Section: Overview	Marc Ross	Not received	0			
TDR1 - SCRF (8)								
201	TDR1 - SCRF (8)	Section: R&D towards mass-production and design for manufacture	Jim Kerby	With Editors	0			
200	TDR1 - SCRF (8)	Section: RF power generation and distribution	Shigeki Fukuda	Not received	0			
199	TDR1 - SCRF (8)	Section: Cryomodule, cryogenic thermal balance, and quadrupole R&D	Paolo Pierini	Received (partial/draft)	70		05/22/2012	
198	TDR1 - SCRF (8)	Section: The S1-Global experiment	Hitoshi Hayano	Not received	0			
197	TDR1 - SCRF (8)	Section: Cavity Integration	Hitoshi Hayano	Not received	0			
196	TDR1 - SCRF (8)	Section: High-gradient SCRF cavity R&D and the yield evaluation	Rongli Geng	Not received	0			
194	TDR1 - SCRF (8)	Section: Development of worldwide SCRF R&D infrastructure	Jim Kerby	With Editors	0			
117	TDR1 - SCRF (8)	Section: Overview	Akira Yamamoto	Not received	0			
TDR2 - ML layout for a flat topography (3)								
107	TDR2 - ML layout for a flat topography (3)	Section: Low-Level RF for Klystron cluster scheme	John Carwardine	Not received	40	06/08/2012	05/29/2012	
104	TDR2 - ML layout for a flat topography (3)	Section: Klystron cluster scheme RF power distribution system	Christopher Nantista	Received by Forge Upload	0			
101	TDR2 - ML layout for a flat topography (3)	Section: Layout	Chris Adolphsen	Not received	0		05/29/2012	Scope of this vs Chapter-2 needs discussion
TDR2 - ML layout for a mountain topography (3)								
106	TDR2 - ML layout for a mountain topography (3)	Section: Low-Level RF for Distributed klystron scheme	John Carwardine	Not received	40	06/08/2012	05/29/2012	
105	TDR2 - ML layout for a mountain topography (3)	Section: Distributed klystron scheme RF power distribution system	Shigeki Fukuda	Received by Forge Upload	0			

05/29/2012 *1/2*