

# **GDE-Tohoku Meeting**

## **WG-2 (SCRF) : Tasks and Goals**

Akira Yamamoto

1. SCRF efforts since Fermilab Meeting
2. Replan of SCRF R&D for TDP1 & 2
3. Tasks and Goals at WG-2

**Sendai, March 4, 2008**

# Efforts since Fermilab Meeting

- **Main Works**

- R&D plan in EDR -->> Replan for TDP1 and TDP2
- Investigate “plug-compatible” interfaces

- **Visiting and meetings**

- FNAL (Oct. 23, 26, 2007)
- IHEP (Nov. 5-6, 2007)
- CEA/Saclay and LAL/Orsay (Jan. 7-8, 2008)
- DESY (Jan. 18, 2008)
- CERN (Feb. 7-8, 2008)
- J-lab (Feb. 14-15, 2008)

- *Many thanks for receiving us and discussions!*

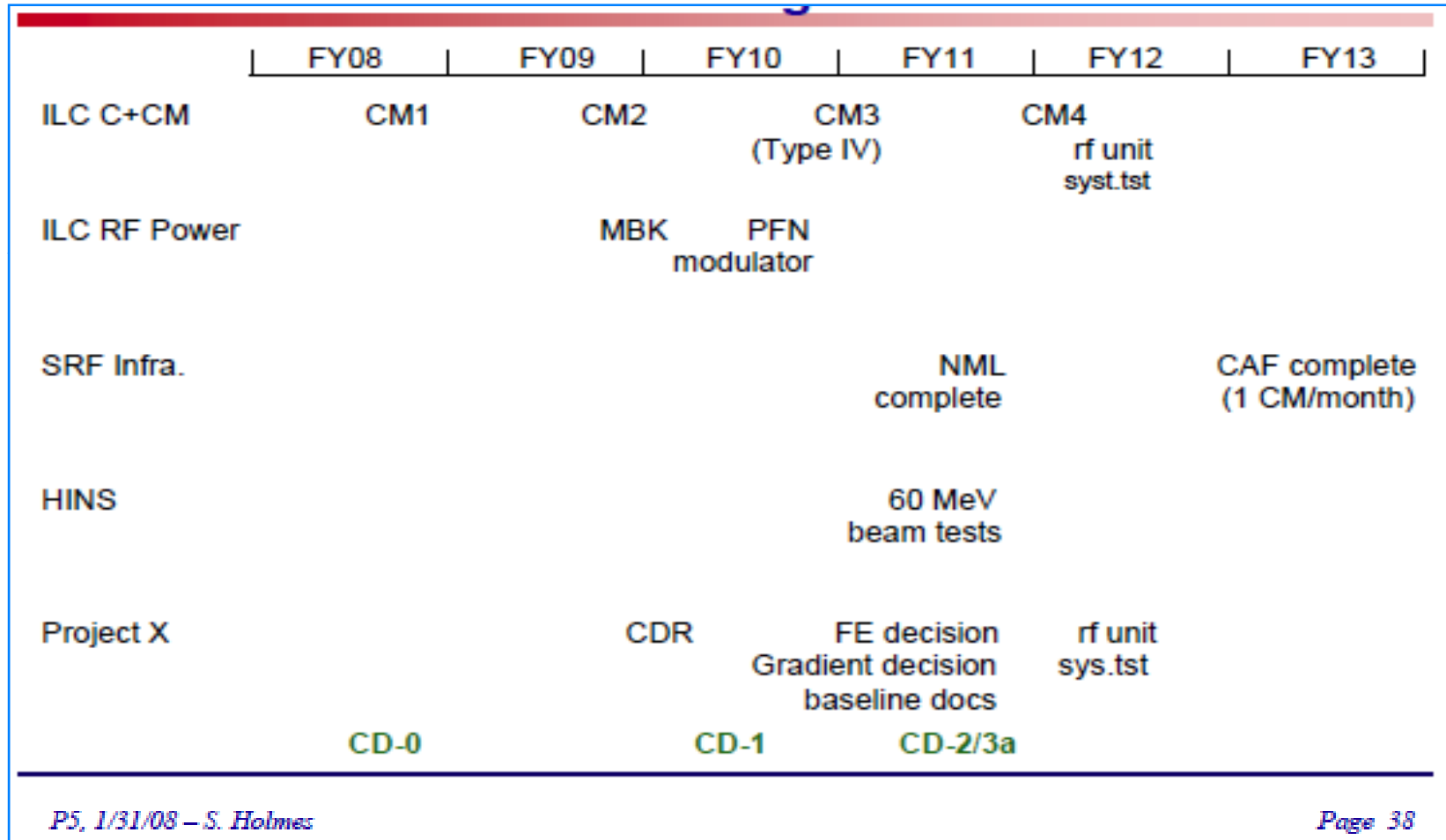
# Replan of ILC-SCRF R&D

updated, March 4, 2008

- **TDP1 by 2010:**
  - **S0:** achieve 35 MV/m with 9-cell cavities at the yield 50 % under well defined processing-base,
  - **S1-Global:** achieve <31.5 MV/m> with cryomodule-assembly
    - with global cooperation (for example, 4-AS, 2-US, 2-EU).
    - Note: the S1 achievable also, if 3 Tesla-type cavities added to the existing 5 cavities in CM2 at Fermilab.
  - **Cryomodule design:** establish “plug-compatible interface and design
- **TDP2-by 2012:**
  - **S0:** achieve 35 MV/m with 9-cell cavities at the yield 90 % under well defined processing-base.
  - **S1:** achieve <31.5 MV/m> with full cavity-assembly (similarly processed) in single cryomodule, CM3 or CM4 (at Fermilab, US)
  - **S2:** achieved <31.5 MV/m> with 3 cryomodule assembly to be powered by 1 RF unit, and with beam acceleration, in STF-2 at KEK.
  - **Industrialization:** Learn from XFEL, & Cooperation with Project-X

# SCRF R&D Plan at Fermilab

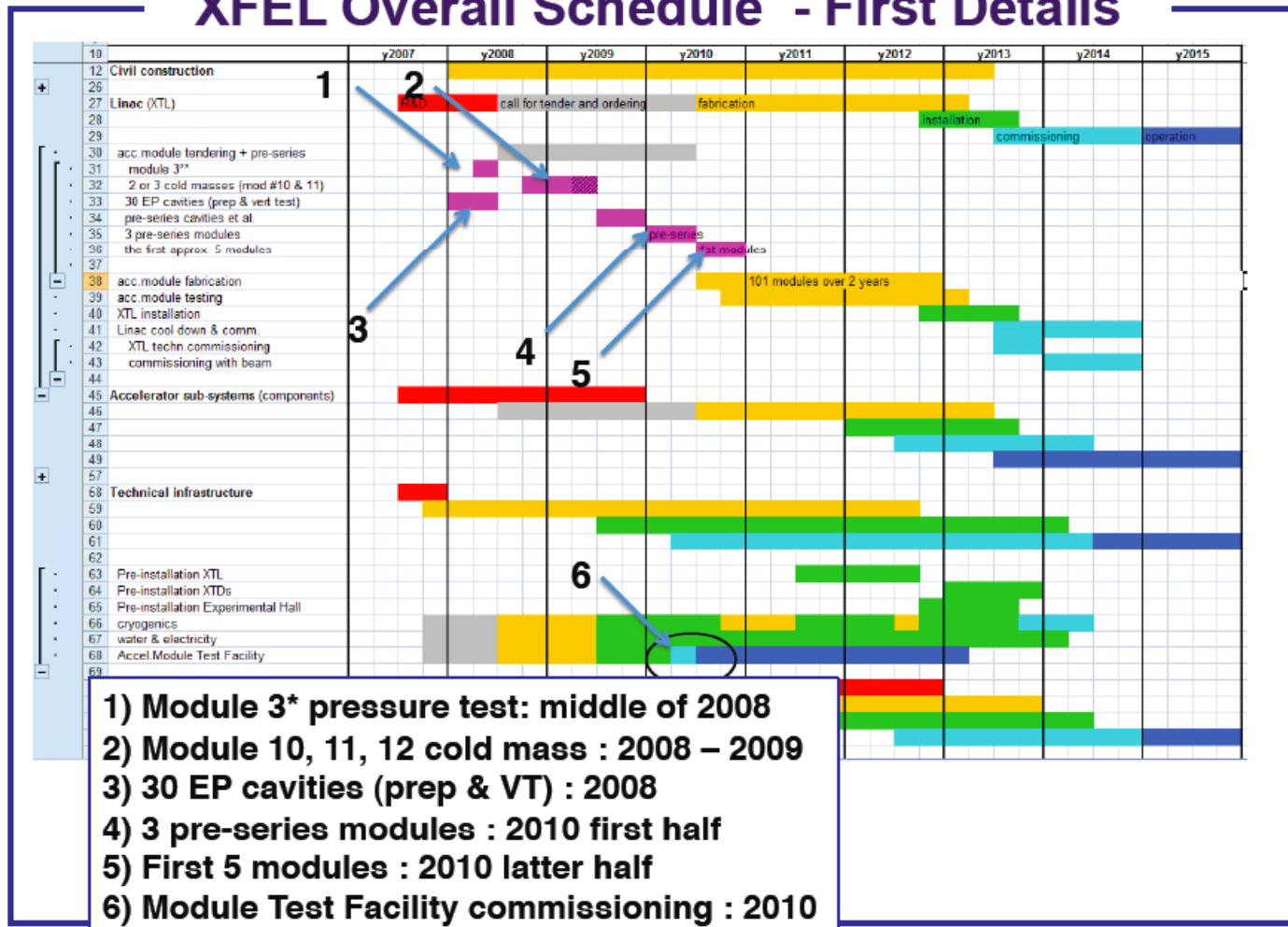
from P5 talk by S. Holmes



# Plan and Preparation for XFEL

We will learn Industrialization

## XFEL Overall Schedule - First Details

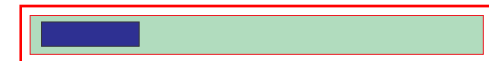


# SCRF and STF Plan at KEK

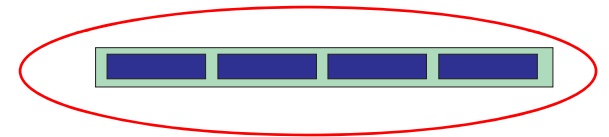
STF0.5 for TESLA-like (done Nov.2007)



STF0.5 for ICHIRO (to finish Mar.2008)  
(red color indicates different cryostat)



**STF1:** for TESLA-like (to finish by summer 2008)



**Full STF1 :** (TESLA-like + ICHIRO)

- Not yet decided
- To finish within CY2008 if to be done



>>> possible extension to **S1**, in  
CY2009 or later (proposed by PMs)

**STF2 :** design in JFY2008, construction in JFY2009-2010  
(from scratch, not extension of STF1)



# Global Plan proposed

		CY08		CY10		CY12
EDR	TDP1			TDP-II		
<b>S0:</b> Cavity Gradient (MV/m)	30					35 (>90%)
KEK-STF-0.5a: 1 Tesla-like						
KEK-STF-0.5b: 1 LL						
KEK-STF1: 4 cavities						
<b>S1-Global</b> (AS-US-EU) 1 CM (4+2+2 cavities)			CM (4 <sub>AS</sub> +2 <sub>US</sub> +2 <sub>EU</sub> ) <31.5 MV/m>			
<b>S2 &amp; STF2:</b> One RF unit & 3 CM with beam		design	Fabrication in industries		Assembled and test at STF	
<b>S1-Fermilab/US</b> ILC-CM-3 or -4		CM1	CM2	CM3(Type-IV)	CM4	

# Cryomodule Design

## with plug-compatible components

- **CM with modular sub-assemblies**

	Cost fraction
– Cavity unit (cavity + helium vessel + tuner)	64%
– Coupler	12%
– Quad package (quad + corrector)	4%
– BPM	2%
– Cold-mass (cold-piping )	x/19%
– Vacuum vessel	y/19%
- **Plug-compatible, Interface specifications (IS)**
  - To be gendrally agree at Fermilab meeting, in April, 2008
- **Plug-compatible IS** enables parallel development, afterwords, during the TDP phases,



# Efforts for Plug-Compatible Cryomodule Design

- SCRF Meeting at DESY (Jan. 18, 2008)
  - Understanding various design options,
  - Home-work assigned,
- Meeting at CERN (Feb. 7, 2008)
- Visiting and Meeting at J-lab (Feb. 14-15, 2008)
- **SCRF webex Meeting (Feb. 20, 2008)**
- GDE Meeting at Tohoku/Sendai (March, 2008)
  - Interim reports and discussions,
  - Further home-work assignment,
- Visiting Indian Laboratories, (March, 10-14, 2008)
- Some other visiting and meeting (TBD)
- SCRF Meeting at Fermilab (April, 21-25, 2008)
  - To reach **agreement on the plug-compatible interfaces** for further component developments

# SCRF Project Management Structure

(March, 4, 2008, still to be updated)

Regional/Intsitutional Effort:			Technical Effort (ML (SCRF) Technology):					
<ul style="list-style-type: none"> <li>- Director-US: Mike Harrison</li> <li>- Director-EU: B. Foster</li> <li>- Director-AS: M. Nozaki</li> </ul>			<ul style="list-style-type: none"> <li>- Project Manager: A. Yamamoto</li> <li>- Associate Managers: T. Shidara, J. Kerby,</li> </ul> <p style="text-align: right;">* Group leader, ** Co-leader</p>					
Regions	Institute	Institute Leaders	Cavity (Process) L. Lilje*	Cavity (Prod./Int.) H. Hayano*	Cryomodule N. Ohuchi* -H. Carter**	Cryogenics T. Peterson*	HLRF S. Fukuda*	ML Integr. C. Adolphsen
US	Cornell Fermilab SLAC ANL J-lab	H.Padamsee R. Kephart T.Raubenhaimer  W. Funk	H.Padamsee M. Shekhar	C.Adolphsen	M. Champion	T.Peterson	R. Larsen	C. Adolphsen
EU	DESY CERN Saclay Olsay INFN Spain	R.Brinkman J. Delahaye O. Napoly G. Wormser C. Pagani	L.Lilje  TBD	L. Lilje  TBD S. Pratt C. Pagani	Parma  F. P.	Tavian		
AS	KEK  Korea Inst. IHEP India Inst.	K.Yokoya	Hayano, Noguchi, Saito	Hayano	Tsuchiya/ Ohuchi	Hosoyama/ Nakai	S. Fukuda	Hayano/Ohuchi

# How We Work Together?

Just to make sure, again

- ***Project Managers are responsible for***
  - Leading the world-wide technical development effort
    - efficiently and effectively
  - Setting technical direction and executing the project toward realization of the ILC
    - Day-to-day project execution and communication
- ***Regional Directors and Institutional Leaders are responsible for***
  - Promoting, funding and authorizing the cooperation programs.
    - Formality to start institutional activities, and periodical oversiting the technical progress,

# Adviser from AAP to work with us

- 1) **Hasan** (Padamsee) will work with us as an adviser from Accelerator Advisory Panel (AAP),
- 2) **Monitor** the EDR work with getting report from PMs/GLs with participating general/individual technical meetings to be carried out during the EDR phase.
  - for examples: monthly technical group leader meetings, specific area meeting (such as SCRF meeting in April), and individual communication,
  - Give us technical **advices**,
- 3) **Review** the progress in the EDR work,
  - for example, two major technical review:
    - Interim review in the middle of EDR (TDP1, 2),
    - Main review prior to the completion of the EDR (TDP1.2).

# GDE Meeting, WG-2, (1)

Day	Time	Subject	Presented by
3/4	8:30	Introduction and S0 and S1: replan (A. Y.) -Tasks and Goals (including S1-global) -S0 replan -S1 plan at Fermilab	Yamamoto L. Lilje S. Mishra
	10:30	Tuner (convener H. Hayano) - Specification table - Lorentz detuning expression - KEK tuner - DESY tuner - INFN-tuner - Availability	H. Hayano Y. Yamamoto S. Noguchi L. Lilje C. Pagani (by L.L.) T. Himmel
	12:30	lunch	
	14:00	Coupler (convener H. Hayano) -Specification table -Fixed coupler study -XFEL coupler	H. Hayano S. Noguchi G. Wormser
	15:30	He Vessel & plug-comp. interface ( N. Ohuchi) - Vessel specification - Interface table for plug-comp. design	K. Tsuchiya N. Ohuchi

18:00 EDMS meeting

# GDE Meeting, WG-2, (2)

Day	Time	Subject	Presented by
3/5	8:30	Cryomodule: 5 K shield (Convener: N. Ohuchi) -Cryostat/cryogenics study at CERN (report from CERN meeting) - Thermal calculation at TTF - Thermal calculation at STF - Discussions	T. Peterson  P. Pierini (by T.P.) N. Ohuchi All
	10:15	Quadrupole (Convener: C. Adolphsen) -Quadrupole specification and design - Quadrupole mover - Alignment of quadrupole	C. Adolphsen C. Adolphsen or ? N. Ohuchi or ?
	12:30	lunch	
	14:00	S1: technical discussions (A. Yamamoto0) -S1-global at KEK-STF -RF distribution system for S1-global -S1 at FNAL (technical comments)	AY, HH, NO S. Fukuda (fnal)
	15:30	Summary and further work-assignment - Comments from AAP - Comments from PMs - Summary (further plan)	All H. Padamsee M. Ross, N. Walker A. Yamamoto

# Summary

- WG-2 Tasks and Goals
  - Discuss and establish the R&D plan for:
    - High Gradient (S0)
    - System performance with cryomodule (S1)
  - Discuss and agree towards:
    - Plug compatible cryomodule design
    - Work sharing
  - Prepare for the next meeting
    - Fermilab at April 21-25 (and SLAC at TBD)
    - GDE-Dubna, and LCWS-Chicago

# Back up

- ...



# GDE Meeting, Plenary, March 3

Day	Time	Subject	Presented by
3/3	a.m.	Joint Plenary Session	
3/3	14:00	PM report: TD phase challenge	N. Walker
	14:45	SRF technology; status and plans	H. Hayano (tbd)
	15:30	Coffee break	
	16:00	JINR Dubna site proposal (tentative)	G. Shirkov
	16:45	Cost reduction strategies (tentative)	W. Bialowons

# GDE Meeting, Plenary, March 6

Day	Time	Subject	Presented by
3/6	9:00	WG1-Summary	TBD
	9:30	WG2-Summary	TBD
	10:00	WG3-Summary	TBD
	10:30	coffee	
	11:00	WG4-Summary	TBD
	11:30	Engin. Manag. Plan (ILC-EDMS)	N. Toge
	12:00	Collaboration b/w ILC and CLIC	J. Dalahaye
	12:30	lunch	
	14:00	Joint closing plenary; GDE close out	A. Yamamoto
	16:00	Workshop close TDP management meeting (PM, APM, PMO, TAGL)	