

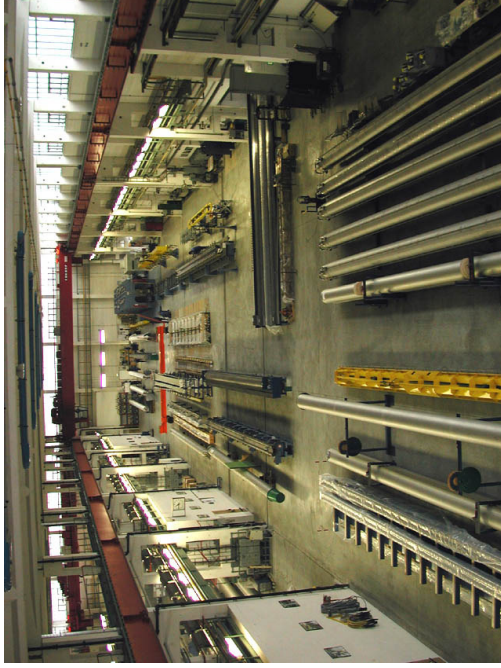
Summary of Industrialization Symposium

- Short list of highlights
- Summary of findings & discussions
- Conclusion

Agenda Industrialization Symposium at SFR 2005, status 4 July 2005, D.Proch

Time	Topics	Speaker	comments
	Part 1: Presentation of past, ongoing or planned laboratory activities for industrialization		
	a, CERN (LHC main magnets industrialization)	C.Wyss	video conference
	b, DESY (XFEL)		
	-cavity fabrication & treatment	D. Proch, DESY	
	-input coupler	T. Garvey, IN2P3	
	-module assembly	B. Petersen, DESY	
	c, KEK	Hayano, KEK	
	d, FNAL activities towards industrialization	N. Lockyear, FNAL	
	e, Comments by Industry	all	
	Part 2: Presentation/ information about existing "Industry Forum"		
	a, Linear collider forum of Japan	N. Nishi, LCF of Japan	
	b, Linear collider forum of Europe	M. Peiniger, ACCEL	
	c, Formation of an US Industrial Consortium for ILC	T. Favale, AES	
	Part 3: Open discussion about best coordinated way to industrialization of SRF technology		
	Contributions by industry and laboratory partners		
	Part 4: Conclusions and outlook	Summary Industrialization Symposium, SRF 2005, D.Proch	2

Series manufacture of the LHC main dipole magnets



Notes about the CERN
approach to industrial
production

C.Wyss & L.Rossi / CERN

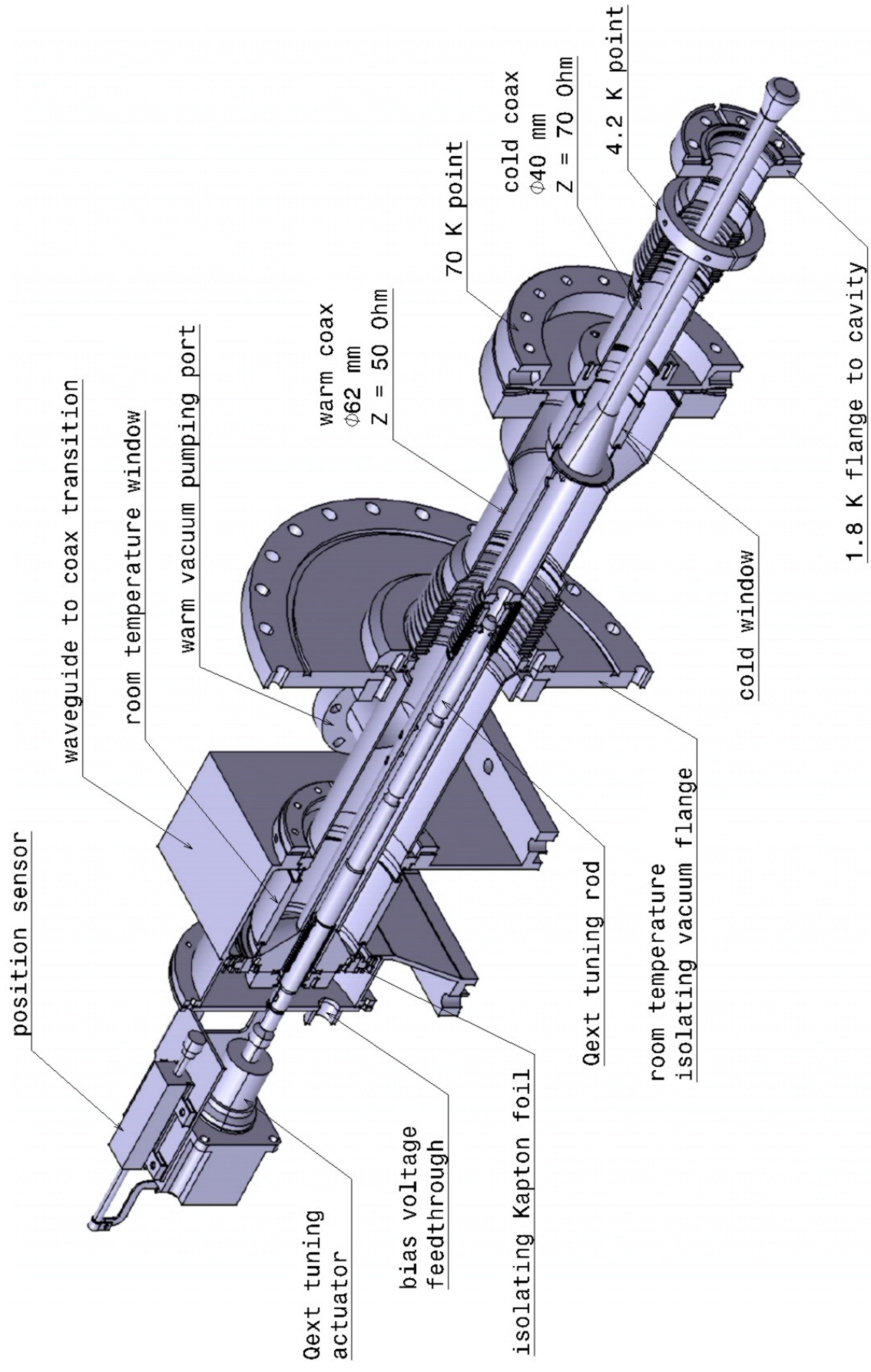
LHC main dipole magnets

- Responsibility for design and performance with CERN
- Responsibility for faultless assembly with the vendors
- Responsibility for operation and maintenance of the tooling with the owners of the tooling design
- Quality checks after completion of each main assembly step to intercept errors at the earliest moment and minimize the loss of added value
- Bonus (1%) for magnets needing no more than three quenches to reach 9 T (reduced test time and hence cost for CERN)

Industrial evaluations, TESLA

- **Cavity fabrication (welding) for TESLA**
 - Noell (Dornier- Astrium),
- **Cavity preparation and module assembly**
 - Noell,
 - ACCEL
- **Niobium production for TESLA**
 - Noell (W.C.Heraeus)
 - H.C.Stark (under test sheets production)

X-FEL coupler



Study of X-FEL Coupler

- For the XFEL power couplers, industrialization studies will be performed through “Definition contracts”
- Intellectual work (in dialog between the industry and our Lab) :
 - Define all manufacturing processes (analysis and validation models)
 - Risk analysis (process, logistics)
 - Determine cost in series and justify
- Produce 2 prototypes (to be tested at LAL – Orsay)

Cryomodule Assembly

the study shall cover clean room assembly and the assembly outside cleanroom

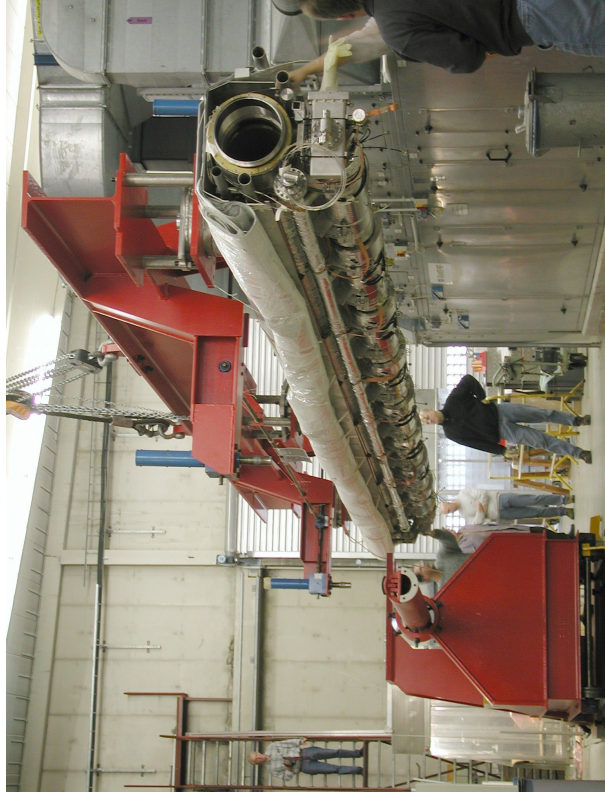
Startpoint: string assembly in cleanroom

(all parts are tested and ready for assembly)

Clean room assembly



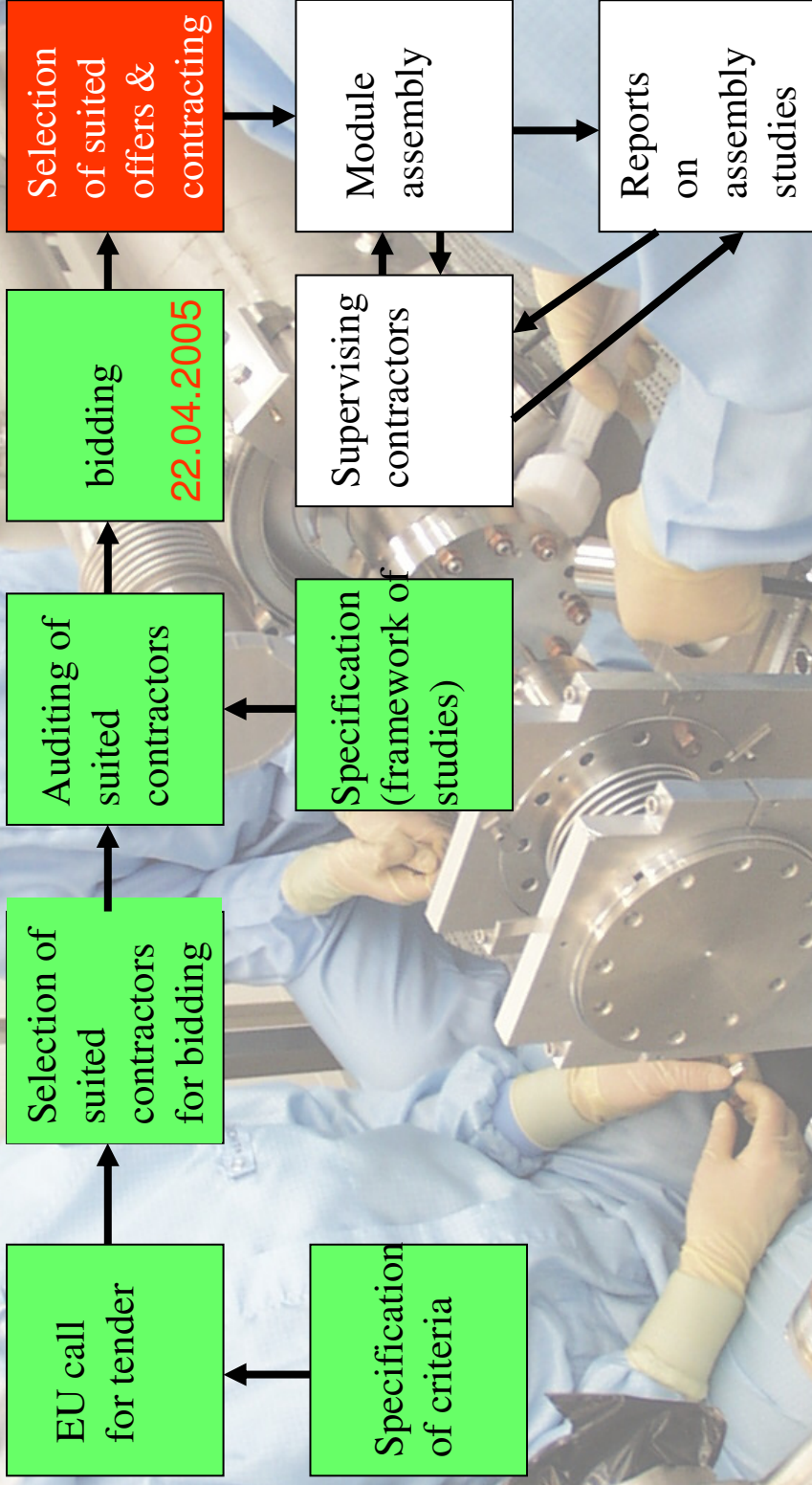
Assembly outside cleanroom



Industrial XFEL-cryomodule design and assembly study

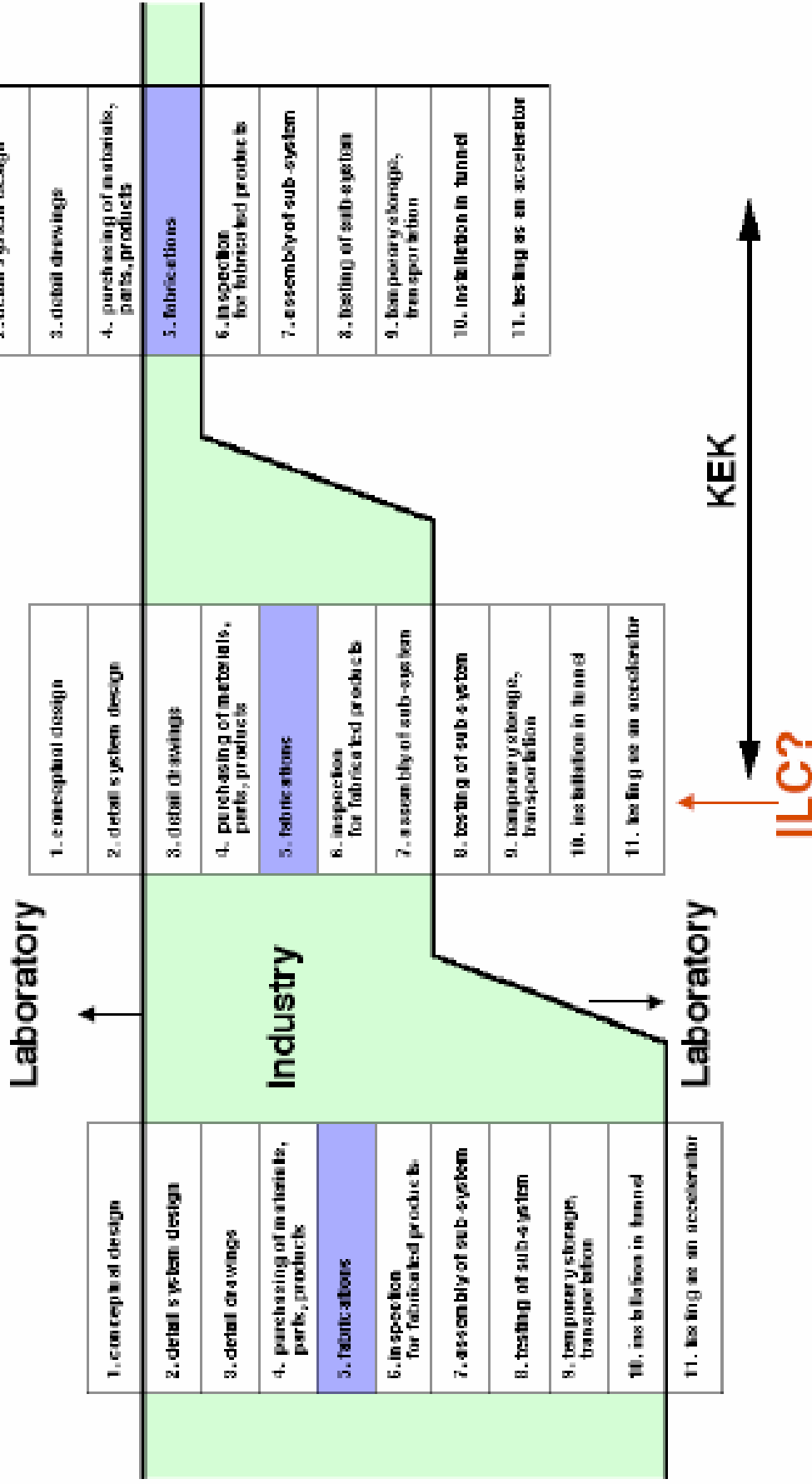
Procurement Procedures

21.01.2005



Boundary of Laboratory - Industry KEK

Lab. - Industry Boundary
Typical examples.



Mass-production in Asia

- Shared by 3 regions, in 5 years(5 x 235 working days).
- Total:15000 cavities, 1500 modules, 750 klystrons, 750 modulators.
in Asia : 5000 cavities, 500 modules, 250 klystrons, 250 modulators.

For example

Production in Asia: (1175 working days)

cavities : 5000 (4.3 / day / company) 10 companies has 5 lines each -> 1 cavity / 12 days
modules : 500 (0.4 / day / company) 5 companies has 2 lines each -> 1 module / 24 days
klystrons : 250 (0.2 / day / company) 2 companies has 3 lines each -> 1 klystron / 28 days
modulators : 250 (0.2 / day / company) 3 companies has 2 lines each -> 1 modulat / 28 days

SMTF ILC Industrial Strategy

- View being developed by Helen Edwards, Shekhar Mishra, Hasan Padamsee, Warren Funk, Pat Kelley, Chris Adolphson and SMTF Collaboration
- “SMTF” committed to developing entire cavity/cryomodule chain with industry
- Will work with “forming” US industrial consortium
Tony Favali, Ken Olsen....
- US industry is “self organizing”
- SMTF role is supplying consortium information



Linear Collider Forum of Japan

Missions

- The objectives of the Forum are to
 - establish international industrial collaboration scheme, and
 - discuss industry's role in facility design and construction,
 - assess associated infrastructure and economical effects.
- Another object is to provide a forum for information exchange between academic society and industrial communities.

Activities



- Ordinary Meetings/Lectures
- Cost Estimation (Cold & Warm Technologies)
- Participation in ILC Regional Working Groups
- Information Exchange with Overseas Laboratories (DESY, CERN, FNAL, SLAC, JLab, SNS, BNL)



„Linear Collider Forum of Europe“
- **short summary for the SRF workshop 2005**

European SCRF Forum

European Superconducting Radio-Frequency Forum

A brief summary of the
Kick-off Meeting
April 7/8, 2005
DESY (Karsten Wurr, see XFEL website)

Very compact version for SRF workshop 2005 (Michael Peiniger)

Discussed Tasks of the Forum

- Create a **European industrial base** (esp. for the European XFEL and the future International Linear Collider)
- Provide a **point of contact** between
 - **European** industry active and interested in all aspects of SC RF accelerators
 - **European** accelerator laboratories, scientists and engineers
 - the **European Union** and its member countries
 - accelerator laboratories in **Asia** and the **US**

LINEAR COLLIDER FORUM OF AMERICA

A SHORT OVERVIEW

ANTHOY J. FAVALE

July 12, 2005

MISSION STATEMENT

- The Linear Collider Forum of America (LCFOA) provides a formal network for it's U.S. industry members with a **common business interests to interact with U.S. Government** funded R&D efforts during the design of The International Linear Collider (ILC) in the U.S..
- The LCFOA provides a partnership between its industry members and government, National Laboratories, Universities, the ILC

Summary of findings & discussion:

Industry forum

- Industry Fora about SC accelerator technology in all 3 regions
 - Asia: operating since 2 years
 - Europe: under formation
 - USA: under planning
- All with strong local commitment
 - Critical to secure funds for ILC from ministries in all regions
 - Strong local commitment might be necessary at this moment because of differences in technical expertise and political boundary conditions
 - But: danger of too large diversity in technology/design: Is the 1/3 linac per region the right approach for ILC?

Summary of findings & discussion:

Industrialization

- Industrialization of SC accelerator technology is high priority for ILC
- Solid progress by „industrial studies“ in Europe by TESLA effort
- New activities started in preparation for X-FEL
- USA: activities for industrialization just started
- Japan: Intensive interaction between laboratories and industries is established.

Summary of findings & discussions:

Exchange of experience

- Industrial experience is gained in different activities:
 - Financed by funding agencies in different countries
 - Bilateral contracts
 - TESLA, TTC (Tesla Technology Collaboration)
 - X-FEL
 - EU supported activities:
 - CARE
 - EUROFEL
- There also exists „pre-existing knowledge“ and patents

Summary of findings & discussions:

Exchange of experience, cont.

- TTC (Tesla Technology Collaboration) will serve (besides others) as global platform for experience exchange
- Most urgent and critical task for this function is to establish the rules how to handle intellectual properties

Conclusion

- First hand information from key player in industrialization process of SC accelerator technology was presented
- Major action items from this meeting
 - Define rules for exchange of intellectual properties
 - Establish intensive experience exchange
 - GDE should accelerate industrialization effort in the three „global regions“ of ILC
 - Synchronize this effort to avoid divergence of design and technology