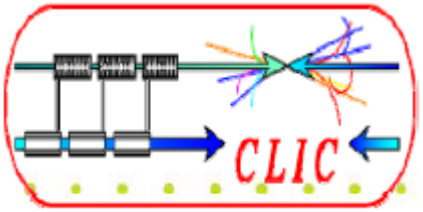

ILC Cost Management

J. Carwardine, T. Himel, F. Lehner,T. Shidara,
L. Hagge, P. Garbincius, H. Braun, G. Riddone
plus EC and Triad

CLIC-ILC Cost & Schedule

also K. Foraz & S. Weisz – working @ CERN

cost_management_phg_20nov08.ppt

ICET – ILC Cost Estimating Tool

- Background & Rationale
  - **safeguard the RDR estimate – *EDMS & database***
  - **facilitate design & cost optimization studies**
  - **seamlessly link to future cost & schedule tools**
- ILC Costing Tool Functional Requirements doc
- **Triad** Project Management firm recently started
- Triad gave status Presentation at LCWS08 incl ILC EC, DESY/EDMS,CLIC-ILC C&S WG
- First face-to-face: Triad & Lars Hagge EDMS
  - **Triad sent "Use Case" sheets to DESY/EDMS**
  - **DESY/EDMS owes Triad API documentation**

Revision of 11 June 2008

Tom Himel and John Carwardine and Peter H. Garbincius

ILC costing tool functional requirements

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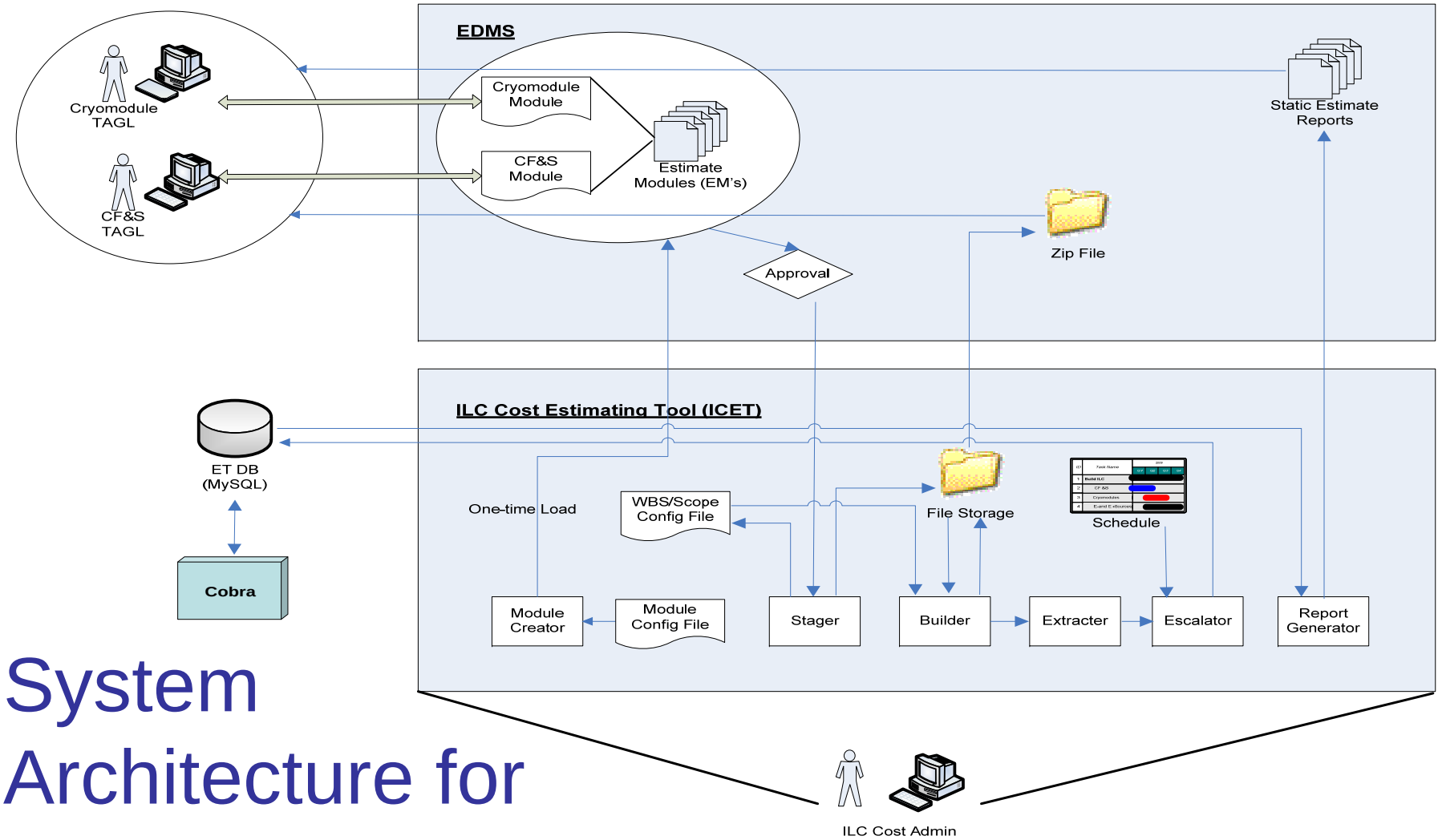
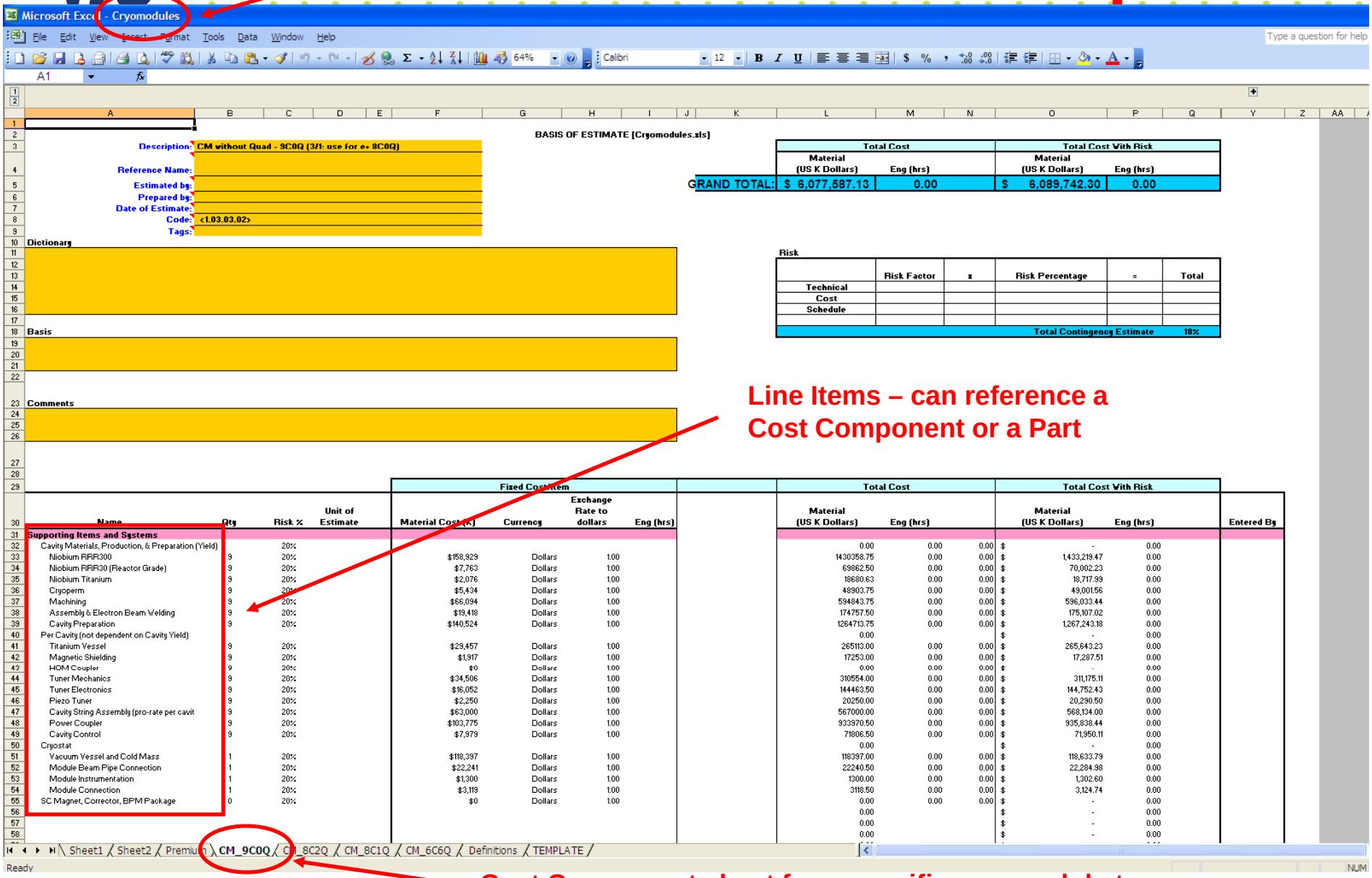
Triad's Tool & Processes



System Architecture for ICET

not all paths shown

Estimate Module example



Triad's presentation

- Showed need for more emphasis on DataBase

  input data flow should be

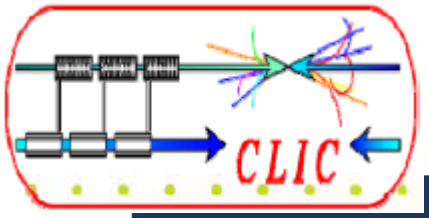
  EDMS => DB, then DB => ICET

  with reports **ICET => both EDMS & DB**

- We must decide whether "what-if" scenario studies are driven from EDMS or from DataBase
- Projected Dates:

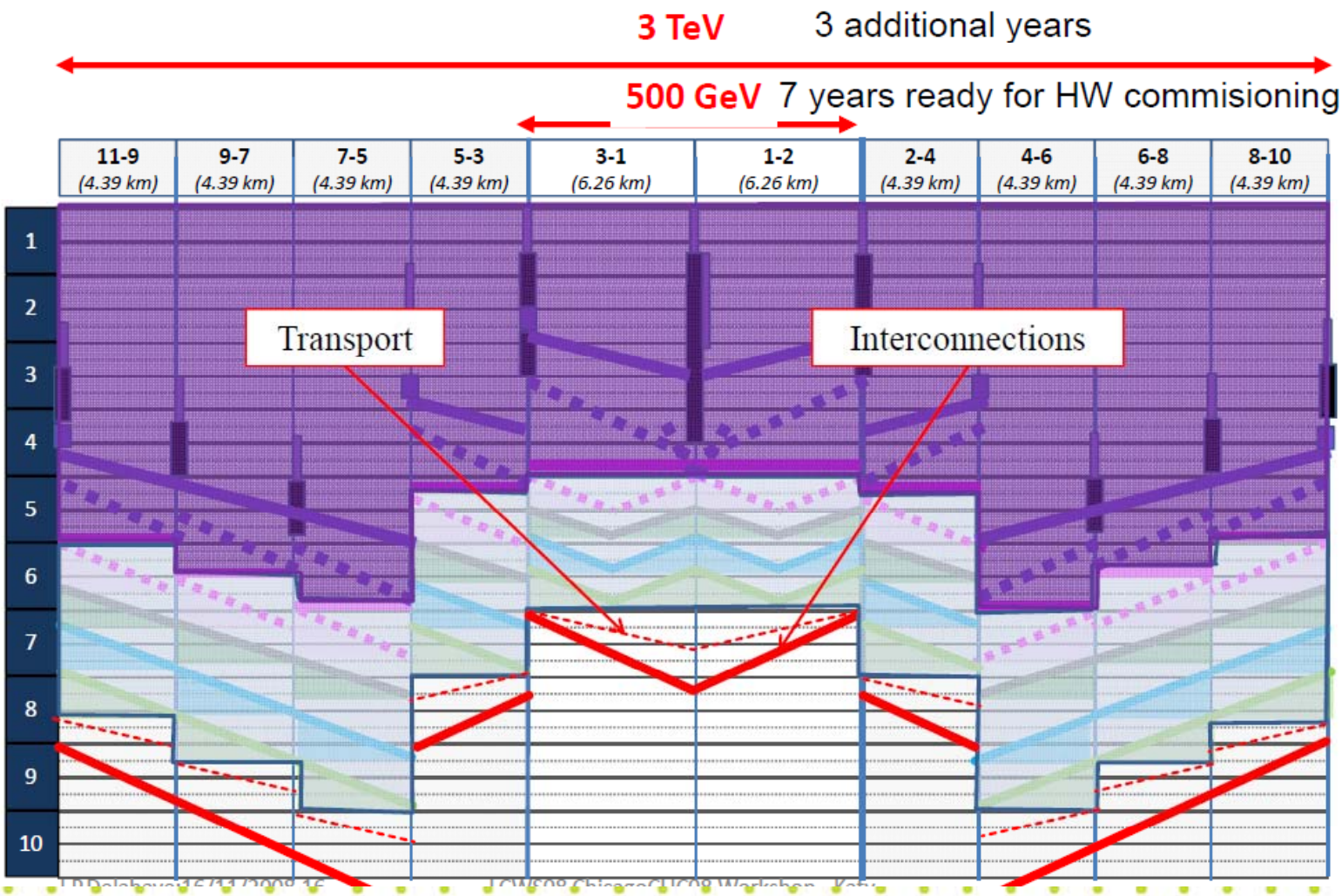
  test modules in ILC hands by **end of Dec08**

  and **fully** operation by **end of March09**

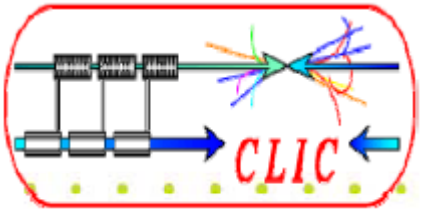


by **Katy Foraz**, to compare to ILC CF&S RDR construction schedule by **Martin Gastal**

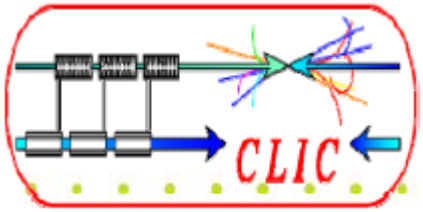
CLIC Machine installation



ILC RDR Cost Estimate for BDS was given to CLIC

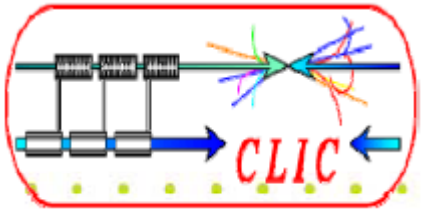


- BDS has closest correspondence CLIC-ILC
  - **comparable systems should have comparable estimates – or understandable differences, e.g. energy, technology (SC vs. perm. mag. final focus)**
  - **goal is to have no public disagreements**
- Given under the ILC Confidentiality Protocol
- BDS does not include Cryomodules & Klystrons
- Sent to CLIC Cost & Schedule Team in Oct08
- Gave “guided tour” to estimate spreadsheet & backup materials at this meeting
- Lots of ILC cost estimating info for CLIC to study!



CLIC plan for Cost Tool

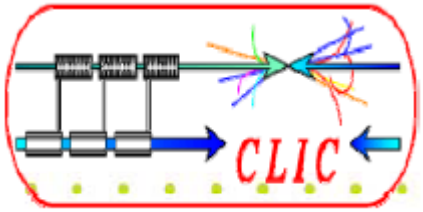
- Updated version of specification including schedule information [EDMS#975066]
- Updated version of DB Entry template
  - **Schedule information**
    - begin-end dates for Resource Requirements planning
    - include both production and installation
    - Triad recommended same for ILC Cost Estimate Tool
  - **Two energy configurations (500 GeV and 3 TeV)**
- Development of tool at CERN using Excel DBE, oracle database and web interface similar to existing CERN management tools (M. Draper, J. DeJonghe)
  - **first prototype ready by 2Q 2009**
  - **final version by end of 2009**



Template 1/2

General information				
PBS reference #				
Element name				
EDMS link to element documentation				
Date of the estimate				
Technical expert (input provider)				
Cost area coordinator (author)				
Currency of estimate				
Schedule			3 TeV	500 GeV
Start of the installation after project approval				
End of installation after project approval				
Assumptions			3 TeV	500 GeV
CLIC parameter version				
Data base table (DBT) version				
Number of items (if applicable)				

Cost estimate			3 TeV	500 GeV	Uncertainty [%]
Tendering					
	Manpower	[FTE]			
Procurement					
	Fixed Costs	[money]			
	Material cost	[money]			
	Contractor manpower	[money]			
	Contractor total cost	[money]			
	Manpower	[FTE]			
Reception					
	Fixed Costs	[money]			
	Manpower	[FTE]			
Installation					
	Fixed Costs	[money]			
	Manpower	[FTE]			
Commissioning					
	Fixed Costs	[money]			
	Manpower	[FTE]			
Total		[money]			
		[FTE]			

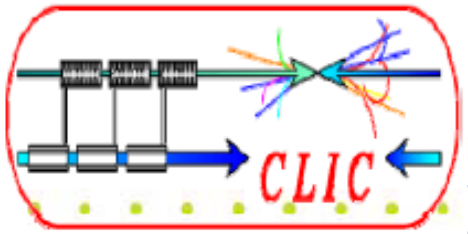


Template 2/2

Reference documents

Comments

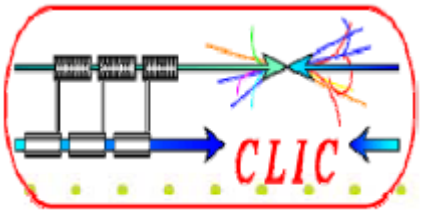
Glossary
Tendering: design, qualification tests prior to tech. specification, technical specification, tendering, contract adjudication
Procurement: fabrication, including assembly and QA, of components
Reception: activity done at CERN before installation
Installation: assembly work at surface, preparation for transport, storage, transport, assembly work in the tunnel
Commissioning: tests in the tunnel before beam



e.g. PBS to level 4 & cost coordinators

0.1	Cost coordinator	
level 0	level 1	level 2	level 3
Project	**Beam and Services**	**Area**	**Sub-area**
CLIC			
	Main Beam		
		Injectors	H. Braun
			Thermoionic gun unpolarized e-
			Primary beam linac for e-
			e-/e+ target
			Pre-injector linac for e+
			DC gun Polarised e-
			Pre-injector linac for e-
			Injector linac
		Damping Rings	H. Braun
			Pre-damping Ring e+
			Pre-damping Ring e-
			Damping Ring e+
			Damping Ring e-
		Beam transport	B. Jeanneret
			Bunch compressor #1 e+

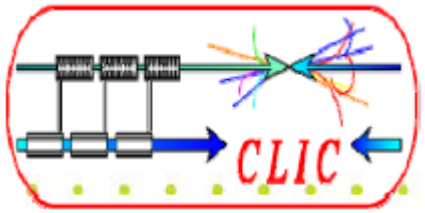
Level 4 systems	Experts
rf system	W. Wuensch
rf powering system	G. McMonagle
collimation system	R. Assmann
vacuum system	P. Strubin
magnet system	D. Tommasini, T. Zickler
powering system	TBD
cooling system	G. Riddone
beam instrumentation	T. Lefevre, H. Schmickler
supporting system	G. Riddone
stabilisation system	C. Hauviller
alignment system	H. Mainaud-Durand, JP. Quesnel
target system	K. Elsener



PBS comparison

level 0	level 1	level 2
Project	**Beam and Services**	**Area**
CLIC		
	Main Beam	
		Injectors
		Damping Rings
		Beam transport
		Linac Accelerators
		Beam Delivery Systems
		Post-collision line
	Drive Beam	
		Injectors
		Frequency multiplication
		Beam transport
		Linac Decelerator
		Dumps
	Interaction Region	
		Machine-Detector Interface
		Experimental Area
	CE and Services	
		Civil Engineering
		Electricity
		Access and Communications
		Fluids
		Transport / installation
		Safety
		Survey

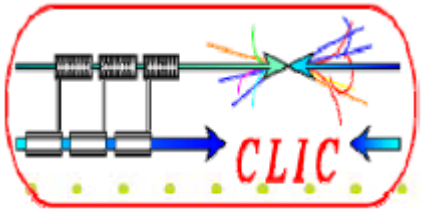
1	TEC
1.01	Management
1.02	Conventional Construction
1.03	Electron Source
1.04	Positron Source
1.05	Damping Rings
1.06	Ring To Main Linac
1.07	Main Linac
1.08	Beam Delivery System
1.09	Experimental Systems
1.10	Global Systems
1.11	Common



Future work

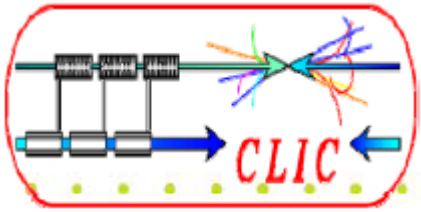
- Schedule for PBS level 2 areas (K. Foraz)
  - **Complete CLIC schedule (main tunnel, exp. areas, injectors)**
  - **Compare CLIC schedule assumptions with ILC assumptions**
  - **Review ILC schedule with same CLIC assumptions**
- Preparation of templates (coordinators)
  - **Schedule information**
  - **Number of units**
- Filling of template (coordinators) with input from experts (archive in CERN EDMS structure)
- Selected area estimate (e.g. module) to be ready by Jan 09
- Full cost estimate to be ready by end of 09
- Tool development in 2009 (prototype by 2Q 09, final version by end of 09)

our common plans:



- CLIC-ILC Cost & Schedule Working Group WEBEX Meetings
  1400 GMT - 2nd Thursday of each month (CLIC Cost & Sched – last Thurs)
- Keep work towards cost estimate mutually transparent
- Profit by synergies
- Understand and communicate unavoidable differences in the methodologies used for the two projects
- Construction & installation schedules for CLIC & ILC w same methodology – June09
- Common ILC/CLIC notes (for mid '09)
  - Tunnel safety underground compliance
    Fabio Corsenego - together with ILC-CFS and CLIC-CES groups
  - Standardization methods to estimate cost of warm magnets including cabling and power supplies – Braun & Garbincius gathering materials, but need engagement of international magnet fabrication experts
  - Description of cost risk assessment – Braun, Riddone, Lehner, Garbincius
  - …

Summary for Cost Management and CLIC-ILC Cost & Schedule WG



- Triad PM Consultants started working on ILC Cost Estimating Tool – presented status to us and Executive Committee & DESY EDMS
- Gave & demonstrated ILC BDS estimate to CLIC
- Compared CLIC & ILC WBS & Estimate Templates
- Need detailed comparison of schedules
- Need common documents: tunnel safety, estimating magnet costs, risk analysis methodology
- Scheduled up monthly WEBEX meeting