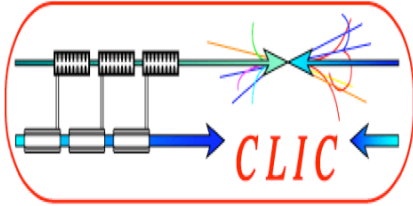


Summary of Cost & Schedule Working Group

Hans Braun, John Carwardine, Katy Foraz, Peter Garbincius, Germana Riddone, Tetsuo Shidara, Sylvain Weisz

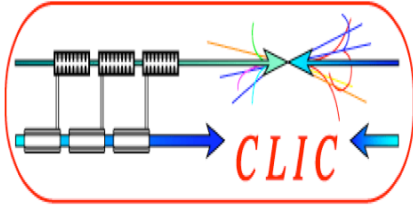


Goals established at Dubna meeting



- **Defining common templates that will be gathered and/or used to catalog cost estimates from the technical groups**
 - **Timely, since both groups are in the process of developing such templates.**
 - **Could allow use of common analysis and reporting tools**
 - **Strongly linked with cost management processes and tools**

- **Defining cost management processes and associated tools**
 - **Requires consideration of how the cost estimate data will be used: report generation, analyses, trade studies, etc**
 - **The CLIC group will be invited to participate in discussions with the consultancy**
 - **Has a short timeframe for the ILC group since they are in the process of a consultancy to support developing of cost management tools.**



Since Dubna...



- *The work of each group continues ...but essentially no joint activities since Dubna due to limited resources in both teams*

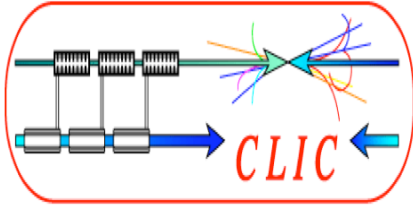
- **Costing templates**

- After comparing the latest ILC and CLIC templates, the approaches are similar but are very different in the details are too different for a practical common template
- But... we should still explore using common methodologies

- **Cost Management processes and tools**

- ILC tool development was essentially stalled for 6 months: consultancy firm was overloaded by ITER commitments
- CLIC has engaged CERN computing group to explore software options, including expansion of in-house tools

- **Additional topics raised during Hans Braun's visit to FNAL in August**

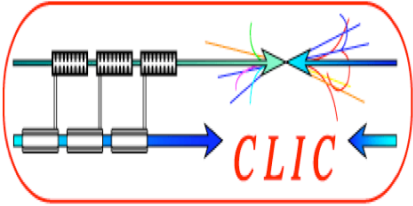


Cost Estimate Templates



- **Intended to address**

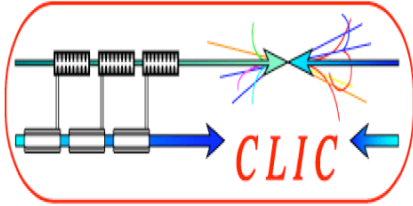
- **The need for a common format to simplify the process of rolling up an overall cost estimate**
- **The level of detail in the WBS/PBS that will be included in the cost estimate roll-up**
- **What specific information is required from each group**
- **Which parameters should be defined from the top down as opposed to allowing the groups to define bottom up**
- **The need for consistent assumptions and bases of estimates across all the technical groups**
- **Framework for traceability of cost estimate information**



ILC Template example



Item name (short, but unique and complete)	CM 8C1Q	PS 200 A
EDMS unique item identifier number		
version number	1	1
description	1.3 GHz Cryomodule with 8 cavities and 1 magnet package	magnet PS - 200 A, 5 KW
cost est in K of currency		
currency (dollars, euros, yen, yuan, pound, CHF, etc.)		
unit of estimate (each, lot, kg, meter, etc.)		
year and month, for which estimate is quoted (2006, 2007)		
confidentiality class 1-5 (see next sheet for description)		
inflation category (construction or non-construction)		
region of estimate (for inflation calculations)		
estimate provided by: (Engineer in Charge)		
approx quantity assumed for cost estimate		
region or country where labor assumed		
Final Design - institutional labor summary - hours		
Sustaining Engineering - hours		
Install-Integrate-Test (for item, not system) - hours		
estimate reference (URL or EDMS #)		
Basis of Estimate document reference (URL/EDMS)		
Beam Deck file reference: name, date, URL/EDMS?		
Technical System/Global System Group (parent)		
TS/GS sub-group (sub-parent)		
uncertainty shape		
lower parameter %		
upper parameter %		
uncertainty reference		
date entered		
entered/logged by who		



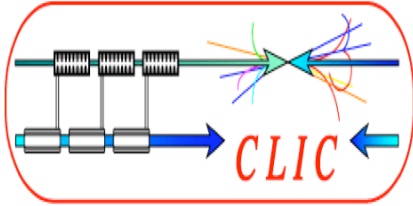
CLIC template example



PBS reference #	CLIC/Main and drive beam/linac accelerators
Element name	Modules
EDMS link to element documentati on	xxxx

Date of the esti mate:	30.06.2008
Person in charge of the esti mate	G. Riddone

CLIC Parameters set	3 TeV baseline			500 GeV baseline	Uncertainty [%]
	3 TeV	1 TeV	500 GeV	500 GeV	
Tendering					
Fixed Costs					
Manpower					
Procurement					
Fixed Costs					
Manpower					
Manufacturing material costs					
Manufacturing labor					
Installation					
Fixed Costs					
Manpower					
QC					
Fixed Costs					
Manpower					
Commissioning					
Fixed Costs					
Manpower					



CLIC template example cont.



Total per unit
 Number of units per linac
 Total per linac

comments/remarks

Clarifications

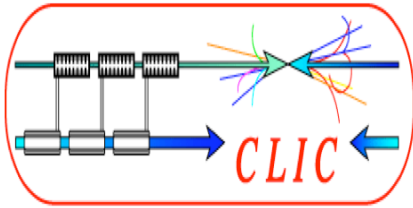
Tendering: design (single components and module), qualification tests prior to tech. specification, technical specification, tendering contract adjudication

Procurement: fabrication, including assembly, of main components: structures, quadrupoles, rf components, vacuum equipment, movers, girders, supports, instrumentation, sensors for alignment and stabilisation (component based) + assembly work at surface

Installation: preparation for transport, assembly work in the tunnel (module based)

QC: quality control, including follow-up of manufacturing, reception and installation (component and module based)

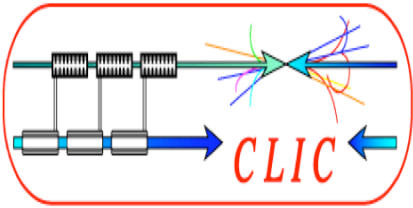
Commissioning: tests in the tunnel before beam



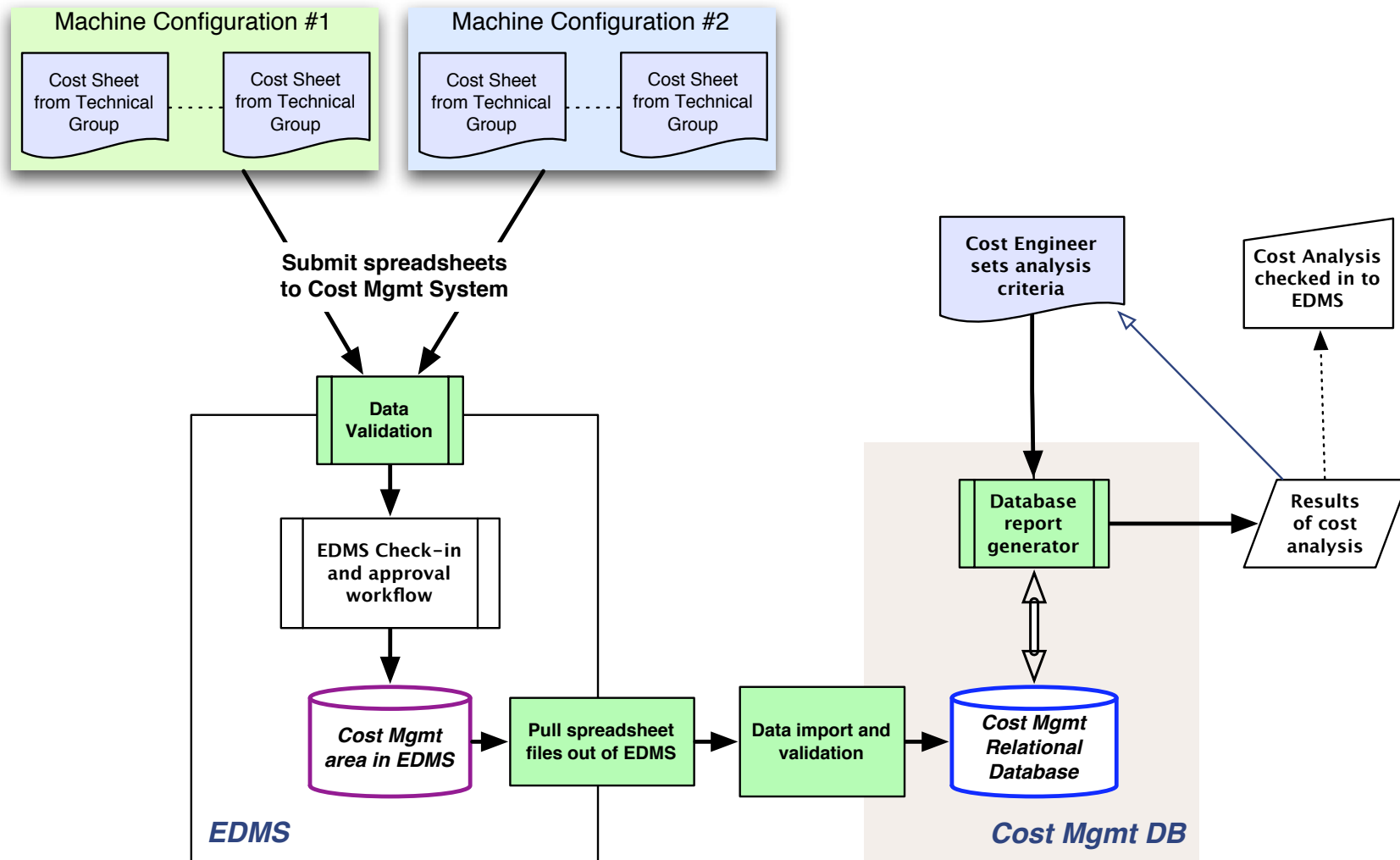
Cost Management Tools

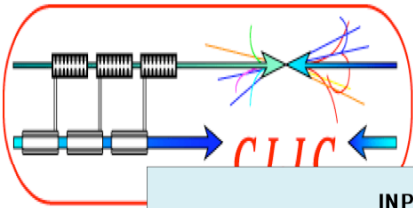


- **Purpose of the Cost Management Tools**
 - Capture, manage, and analyze cost estimate data, document bases of estimate, traceability, configuration management
 - Analyze cost estimates, eg different machine configurations, parametric studies, cost by technical system, area, etc
 - Relational databases (different to project tracking tools)
- **ILC activities have been stalled for several months**
 - Consultancy firm (Triad) has been unavailable to begin the work
 - We are hopeful that this will be resolved in a few weeks
 - A kick-off meeting is scheduled with Triad on Sept 24-25
- **CLIC has engaged CERN Information Systems Group**
 - Evaluate possible commercial or in-house software packages

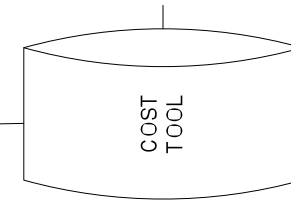
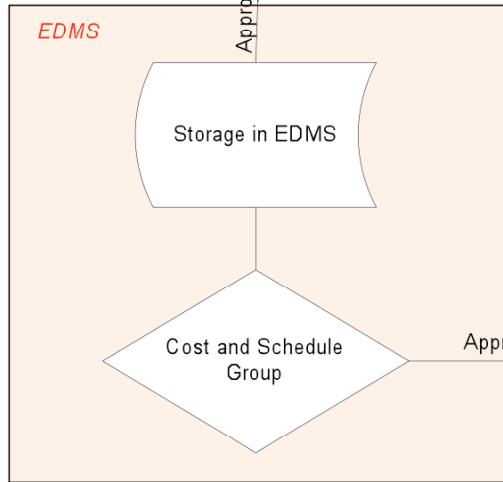
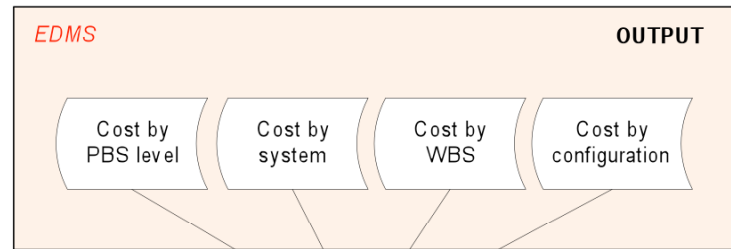
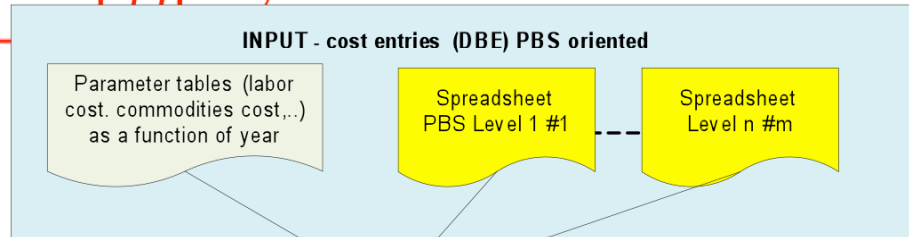


ILC Cost Management Model

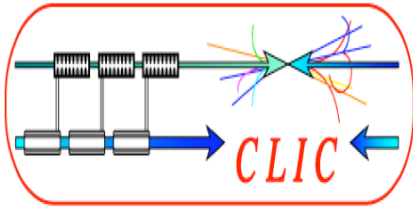




CLIC Cost Management Tools



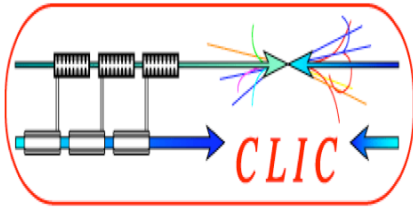
The cost for a given entry of the PBS is computed by moving up the tree to the highest level with complete DBE information and summing all DBE entries at this level



Additional topics



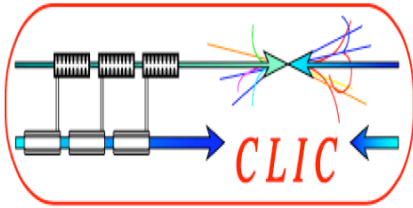
- **CLIC team requested the Beam Delivery System cost estimates from the ILC/RDR**
 - **CLIC plan to use cost estimates for ILC BDS components as a cost-book for CLIC**
 - **Meets the overall goal of assuring the ILC and CLIC cost estimates are mutually consistent**
 - **CLIC Cost & Schedule team have been given access**



Common bases of estimates..?



- **Recently discussed possibility of joint documents describing common bases of estimates, eg**
 - **Life safety compliance for underground structures**
 - **Conventional magnets: common “rules of thumb”**
- **But it is clear we are also diverging in some areas**
 - **Cost estimating approach:
CLIC cannot follow exactly the ILC/RDR,
priority for CLIC is good precision for cost drivers.**



CLIC Workshop Oct 14-17



- **Cost & Schedule is part of the working group “Technical Issues, Integration & Cost”**
- **Working group goals**
 - **Comparison of CLIC and ILC cost approaches**
 - **Specifications and options for software tools**
 - **Identify synergies between ILC and CLIC**
- **Schedule...**

Thursday 16.10.2007, 14:30 – 18:30 – Cost issues

Speaker	Title
J. Purvis	Project Management and Control System overview
H. Braun, G. Riddone	CLIC costing tool specifications
J. Carwardine, FNAL	ILC software tool considerations for cost estimate
J. De Jonghe	CERN proposal for software tool for cost estimate
all	Conclusions