



ILC PROJECT

ENGINEERING DESIGN REPORT

CFS Europe – KICK OFF MEETING

CERN 3, 4, 5 September 2007

PROPOSED CFS WORK PACKAGES

J-L Baldy



SUMMARY

1. *Extracts from Chapter 7 of RDR*
2. *Scope of CFS Work Packages*
3. *ILC Technical Time Schedule for CFS Design and start of Works*
4. *Functional WBS and WP descriptions, EDR Phase 1*
5. *Functional WBS and WP descriptions, EDR Phase 2*
6. *Deadlines and Distribution of WP, EDR Phase 1*
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1 Extract from Chapter 7 of the RDR "the Engineering Design Phase"

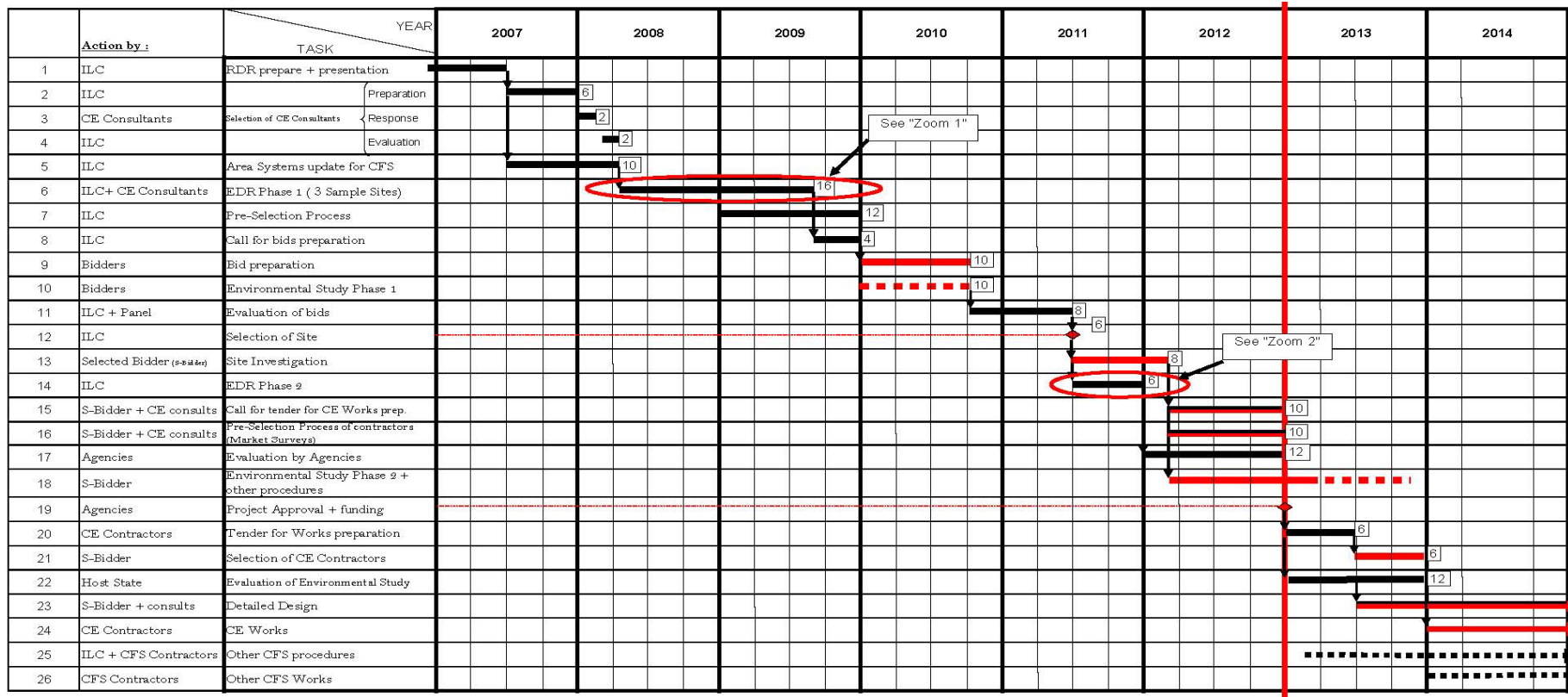
- ***The Technical Work of the RDR Phase to be organized in Work Packages***
- ***Each Level 3 System Manager to manage a Collection of WP representing the WBS***
- ***WP should have well defined Scope (suitable for distribution)***
- ***PM and Level 3 Managers are primarily responsible for identifying Key Milestones and Deliverables***
- ***Level 3 System manager 1 : Civil Engineering : J-L Baldy then J. Osborne (CERN)***

2 Scope of CFS Work Packages

- *Collect of frozen data from Area, Technical and global Systems (after iterating process)*
- *Evaluate and supply the necessary resources*
- *Set up the Methodology for Design and Work Phases (Splitting and ordering of tasks, Selection and Contracting of Consultants, Architects, Experts, ...)*
- *Set up of detailed Time Schedule for all Phases*
- *Set up of Cost Estimates at $\pm 10\%$ (with a “before/after T_0 ” splitting)*
- *Produce all Design Documents (with Contribution from External Consultants)*
- *Full writing of EDR CFS Design Chapters*



3 ILC Technical Time Schedule for CFS Design and Start of Works



- Notes :**
- 1.The mentioned 'Actions by bidder(s)' assumes that the selected Host State manages and provides the financing for (at least) the CE Works in its bid to host. These Actions are highlighted in RED.
 - 2.Line 11 : Panel of internationally recognised experts will have to be set up to evaluate the bids, rank them and propose a "winner".
 - 3.Overall management by ILC-GDE-CFS teams which will be necessary at various levels is not systematically mentioned in the action column.
 4. Provided that the overall time span of 7 years from To for construction works and installation is confirmed, this schedule implies start of commissioning at the end of 2019.



4 Functional WBS and WP Descriptions, EDR Phase 1

1/2

A -Final Criteria Development and Design						
x.x.1	Work Package 1 - Civil Works specific to the Americas Regions sample site					
	x.x.1.1	Civil Engineering				
		x.x.1.1.1	Develop Final Criteria			
		x.x.1.1.2	Design and calculations			
		x.x.1.1.3	Cost estimates			
		x.x.1.1.4	Time Schedules			
		x.x.1.1.5	EDR writing			
x.x.2	Work Package 2 - Civil Works specific to the Asian Region sample site					
	x.x.2.1	Civil Engineering				
x.x.3	Work Package 3 - Civil Works specific to the European Region sample site					
	x.x.3.1	Civil Engineering				
x.x.4	Work Package 4 - Electrical Engineering (all three sample sites)					
		x.x.4.1	Electrical Engineering specific to the Americas Region sample site			
		x.x.4.2	Electrical Engineering specific to the Asian Region sample site			
		x.x.4.3	Electrical Engineering specific to the European Region sample site			
		x.x.4.4	Electrical Engineering common to all three sample sites			
x.x.5	Work Package 5 - Air Treatment Equipment (all three sample sites)					
x.x.6	Work Package 6 - Process cooling water and Piped Utilities (all three sample sites)					
x.x.7	Work Package 7 - Handling equipment (all three sample sites)					
x.x.8	Work Package 8 - Safety equipment (all three sample sites)					
x.x.9	Work Package 9 - Survey and Alignment (all three sample sites)					



4 Functional WBS and WP Descriptions, EDR Phase 1

2/2

B - Costs estimates, cost reduction Time schedules and Value Engineering	
x.x.10	Work Package 10 - CFS cost estimates, time schedules, value Engineering Reviews and EDR final writing
x.x.10.1	Total CFS cost estimate (from WP 1 to 9)
	x.x.10.1.1 Americas Region sample site
	x.x.10.1.2 Asian Region sample site
	x.x.10.1.3 European Region sample site
x.x.10.2	Overall Time schedules (from WP 1 TO 9)
	x.x.10.2.1 Americas Region sample site
	x.x.10.2.2 Asian Region sample site
	x.x.10.2.3 European Region sample site
x.x.10.3	Review and possible cost reductions
	x.x.10.3.1 Cut and cover / near surface alternatives
	x.x.10.3.2 Verify Tunnel costs
	x.x.10.3.3 Review tunnel diameter requirements
	x.x.10.3.4 Review Shaft Requirements (number and size)
	x.x.10.3.5 Review Process Water Requirements
	x.x.10.3.6 Review Air Handling Requirements
	x.x.10.3.7 Review Electrical Requirements
	x.x.10.3.8 Review Life Safety Solutions for one and two tunnels
	x.x.10.3.9 Construction schedules for cost advantages
x.x.10.4	EDR phase 1 final writing (from WP 1 to 9)
C - Regional Interest Efforts	
x.x.11	Work Package 11 - Site selection process
	x.x.11.1 Pre-selection process
	x.x.11.2 Call for bids documents preparation and launching
	x.x.11.3 Interaction with bidders
	x.x.11.4 Evaluation of bids
	x.x.11.5 Proposal for selection of the final site

5 Functional WBS and WP Descriptions, EDR Phase 2

A -Final Criteria Development and Design					
x.x.1	Work Package 1 - Civil Works specific to the selected site				
	x.x.1.1 Civil Engineering				
		x.x.1.1.1	Develop Final Criteria		
		x.x.1.1.2	Design and calculations		
		x.x.1.1.3	Cost estimates		
		x.x.1.1.4	Time Schedules		
		x.x.1.1.5	EDR writing		
x.x.2	Work Package 2 - Electrical Engineering				
	x.x.2.1 Electrical Engineering specific to the selected site				
	x.x.2.2 Electrical Engineering (update)				
x.x.3	Work Package 3 - Air Treatment Equipment				
	x.x.3.1 Air Treatment Equipment (update)				
x.x.4	Work Package 4 - Process cooling water and Piped Utilities				
	x.x.4.1 Process cooling water and Piped Utilities (update)				
x.x.5	Work Package 5 - Handling equipment				
	x.x.5.1 Handling Equipment (update)				
x.x.6	Work Package 6 - Safety equipment				
	x.x.6.1 Safety Equipment (update)				
x.x.7	Work Package 7 - Survey and Alignment				
	x.x.7.1 Survey and alignment (update)				
B - Costs estimates, Time schedules and EDR writing					
x.x.8	Work Package 8 - CFS cost estimates, time schedules and EDR final writing				
	x.x.8.1 Total CFS cost estimate (from WP 1 to 7)				
	x.x.8.2 Overall Time schedules (from WP 1 TO 7)				
	x.x.8.3 EDR phase 2 final writing (from WP 1 to 7)				

6 “Bidders” Work Package(s) (Indicative, to be decided by the Bidders)

In the frame of their own Work Package(s), Bidders will :

- *Become aware of GDE Requirements and EDR Phase 1 and ask for any clarification needed*
- *Make a Decision on which Site to propose (if not yet done)*
- *Make a decision on what is to be provided and paid by the Bidders from the EDR WBS*
- *Carry out Site Investigation (or use existing data if sufficient)*
- *Carry out full design of what is to be provided*
- *Set up a full Description of the Infrastructure to be provided*
- *Set up Cost Estimates and Time Schedule for the above.*
- *Make Decisions on Methodology and Organigrams (how ?, with who ?)*
- *Assess environmental Aspect of the Project for proposed Site and measures to comply with Host State and Local Regulations*
- *Put together various parts and overall writing of the Bid*



7 Deadlines and Distribution of Work Packages EDR Phase 1

WP	Designation	Deadline	Region in charge Origin of Resources
1.	Civil Engineering Americas SS	Sept. 2008	Americas Region ?
2.	Civil Engineering Asian SS	Sept. 2008	Asian Region ?
3.	Civil Engineering European SS	Sept. 2008	European Region ?
4.	Electrical Engineering	Oct. 2008	Americas/European Regions ?
5.	Air Treatment Equipment	Oct. 2008	Americas Region ?
6.	Process Cooling Water and Piped Utilities	Oct. 2008	Americas Region ?
7.	Handling Equipment	Sept. 2008	European Region ?
8.	Safety Equipment	Nov. 2008	Asian Region ?
9.	Survey and Alignment	Nov. 2008	Americas/European Regions ?
10.	Cost Estim., T.S., Value Engineering and EDR writing	Sept. 2009	Americas/Asian/European Reg. ?
11.	Site Selection Process	June 2011	Americas/Asian/European Reg. ?



8 Deadlines and Distribution of Work Packages EDR Phase 2

WP	Designation	Deadline	Region in charge Origin of Resources
1.	<i>Civil Engineering</i>	<i>Sept. 2011</i>	<i>European Region ?</i>
2.	<i>Electrical Engineering</i>	<i>Sept. 2011</i>	<i>Americas Region ?</i>
3.	<i>Air Treatment Equipment</i>	<i>Oct. 2011</i>	<i>Americas Region ?</i>
4.	<i>Process Cooling Water and Piped Utilities</i>	<i>Oct. 2011</i>	<i>Americas Regions ?</i>
5.	<i>Handling Equipment</i>	<i>Oct. 2011</i>	<i>European Region ?</i>
6.	<i>Safety Equipment</i>	<i>Oct. 2011</i>	<i>Asian Region ?</i>
7.	<i>Survey and Alignment</i>	<i>Oct. 2011</i>	<i>Americas/European Regions ?</i>
8.	<i>Cost Estim., T.S., Value Engineering and EDR writing</i>	<i>Dec. 2011</i>	<i>Americas//Asian/European Reg. ?</i>

9 Conclusions

- *A lot to be done within rather short Time Spans, and involving a large Number of Partners*
- *First Priorities :*
 - *Evaluate necessary resources, induce, receive CFS Work Package Bids and make final Selection (+ MOU)*
 - *Collect frozen Data from all concerned System*
- *Working in close connection between the 3 Regions important for EDR Phase 1, essential for EDR Phase 2*
- *Smooth Cooperation essential during EDR Phase 2 between ILC and selected Bidder teams*