

MDI Work Plan and Milestones

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ILD Workshop

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1. Demonstrate proof principle on critical components. When there are options, at least one option for each subsystem will reach a level of maturity which verifies feasibility.
2. Define a feasible baseline design. While a baseline will be specified, options may also be considered.
3. Complete basic mechanical integration of the baseline design accounting for insensitive zones such as the beam holes, support structure, cables, gaps or inner detector material.
4. Develop a realistic simulation model of the baseline design, including the identified faults and limitations.
5. Develop a push-pull mechanism, working out the movement procedure, time scale, alignment and calibration schemes in cooperation with relevant groups.
6. Develop a realistic concept of integration with the accelerator including the IR design.

7. Simulate and analyze updated benchmark reactions with the realistic detector model. Include the impact of detector dead zones and updated background conditions.

8. Simulate and study some reactions at 1 TeV, including realistic higher energy backgrounds, demonstrating the detector performance.

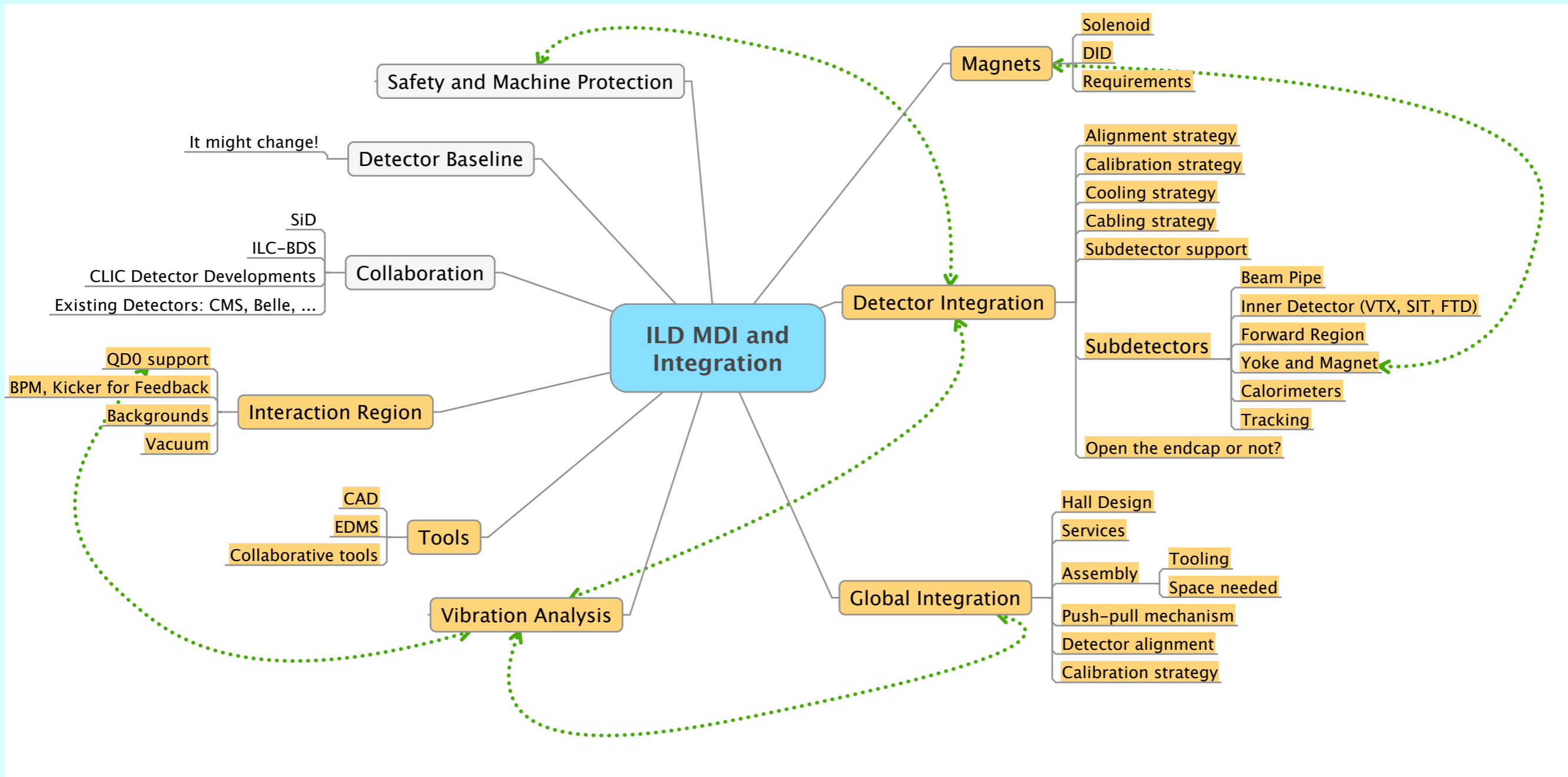
For 7 and 8, Specific physics channels will be investigated and defined by the Physics Common Task Group and supported by the Software Common Task Group.

9. Develop an improved cost estimate. Include in this work the identification of cost drivers and specification of main uncertainties.

For each of the above items, a detailed timeline with identified milestones will be constructed, leading to a detailed baseline design of the detector by 2012. Required resources, whether currently in place or not, will be specified.

- What is the anticipated level of detail?
 - Conceptual ideas?
 - Technical designs?
 - Prototypes and measurements?
 - Blueprints and specifications?
- We need to synchronise with the global ILD efforts
 - What are the guidelines for the overall ILD work plan? MDI is just a part of the whole game!
 - The major work within ILD is ongoing in physics simulations - for good reasons. What is the input there needed from MDI/Integration. And when?
- We need to synchronise with the global ILC efforts
 - GDE-BDS
 - SiD
- Identify critical items and resources

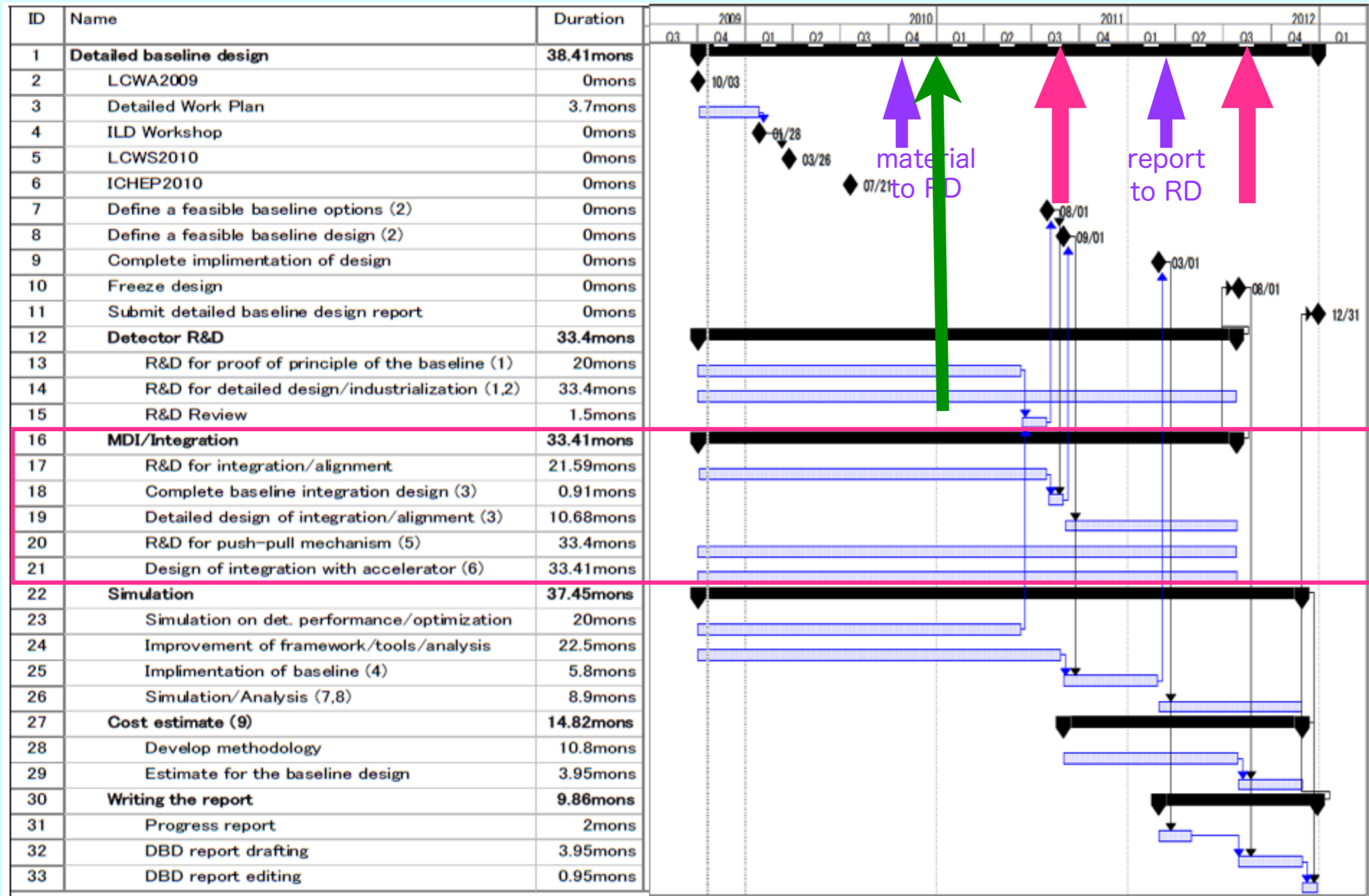
- My view (probably incomplete):



ILD Milestones from Provisional Work Plan



Input to Physics Simulations?



Work Plan	Responsibility	Status	date
Push Pull			
platform		proposed	Mar.09
mechanism, e.g. air-pads, rails, Hilman rollers etc.			
stability during movement			
re-positioning within +/- 1mm and 100urad			
tolerable for synchrotron radiation and pairs ?			
self-shielding of detector with Pacman for radiations	T.Sanami	done for Lol	Mar.09
Pacman design	K.Sinram, A.Herve	on-going	Jan.10
cryogenics,i.e. flexible cryo & vacuum lines and current supply			
QDO			
support	H.Yamaoka, M.Jore	on-going	Jan.10
vibration	H.Yamaoka	on-going	Jan.10
re-positioning within +/- 200um and 5urad by actuator			
monitoting by MONALISA, integration ?			
opening endcap on the beam line ?	K.Buesser	on-going	Jan.10
1m wide space is very small and the endcap is very heavy			
opening and assembly at the garage position	C.Clerc	done for Lol	Mar.09
calibration and re-alignment (monitoring) of sub-detectors	sub-detector		
Z-pole running for the calibration in every time ?	sub-detector		
experimental hall design with SiD and accelerator	A.Herve	on-going	Jan.10
Beam induced backgrounds			
upstream/downstream beam backgrounds	LDC,GLD	to be updated	
collimation depth, aperture of beam pipes around IP	BDS	to be updated	
beam-beam backgrounds		done for Lol	Mar.09
aperture and material of beam pipes around IP	H.Videau	on-going	Jan.10

Work Plan	Responsibility	Status	date
Detector integration	Integration Coordinator ?		
each integration box separated by 'no-go zones'		proposed	Jan.10
support structures in 'no-go zones' ?			
strength of deformation and vibration			
cooling : all heat to be taken out by each sub-detector		proposed	Jan.10
cabling of signals and electric powers	U. Schneekloth	done for Lol	Mar.09
gas lines			
alignmnet and monitoring system and time	sub-detector		
calibration method and time	sub-detector		
Z-pole running and the integrated luminodity ?	sub-detector		
TPC requests 1pb^{-1} ; a few hours(days) with 10(1)% e^+ source			
Magnet System			
Coil and anti-DID	F.Kircher	on-going	Jan.10
Yoke design ; tail catcher and muon system	U. Schneekloth, R.Stromhagen	on-going	Jan.10
Coil in endcap			
Vacuum System	U.Suetsugu, H.Videau	done for Lol	Mar.09
Tools			
3D-CAD : CATIA	M.Jore	on-going	Jan.10
EDMS	C.Clerc	on-going	Jan.10
Collaborative tools			

What is missing?

- Decision dates (e.g. Milestones)
- Decision dependencies:
 - what do we need to decide before we can decide?
- Resource Planning
 - Resources are extremely limited. My guess: less than ~4-5 FTE working on global ILD integration and MDI issues (~20 people, 20% each), might be some more on subdetector levels we don't know about.
- We need better contacts to technical experts in the subdetectors
 - works quite well for some subdetectors (yesterday TPC, FCAL were attending), but what are the others doing?

Problem:

- What are the decision processes within ILD?
- Who decides about baseline design changes?
- Who decides about cross-subdetector technical issues?

Decisions to be taken

- How do we optimise the general detector parameters (sizes)?
- How do we optimise L^* vs luminosity?
- Do we want to open the endcaps?
- Integration methodology:
 - Can we agree on integration boxes with no-go areas?
 - Can we define a cooling strategy: every sub-detector takes out its own heat completely?
 - WBS structure for EDMS, to be synchronised with SiD
- Do we need an DID/Anti-DID? Who will redo the related background studies for ILD?
- Do we need corrector coils?

- What is the detail of the work plan and milestones needed?
- How do we synchronise the MDI work plan with the ILD work plan?

- **How do we decide?**

Zeuthen 2008:

We propose the following decision path

- 1) As much as possible, the subdetector / technology groups should work out proposals for needed decisions, and propose solutions
- 2) If needed different subdetector groups should interact with each others to sort out interdependencies, and agree on common proposals
- 3) If no agreement can be found, the JSB will participate in the discussion
- 4) The final decision for ILD will be with the executive board, after (for important points) a process of consultation and discussion with the general assembly

- A first provisional version of the MDI/Integration work plan is under development
- Milestones and decision points are still under discussion
- Coherence is still missing
- Resources in the global integration business are not comparable to efforts ongoing in other parts of the ILD endeavour

- Some design decisions are needed to be taken in the coming months (or even now). How do we do it?

- Basic question:
What is the added value which is expected from the DBD compared to the Lol? And how do we relate the resources accordingly?