

ILD Assembly Timeline

2020/12/10

Yasuhiro Sugimoto

@ILC detector seasonal meeting

Timeline proposed by IDT

- Tatsuya Nakada' presentation at AWLC2020
 - Detector proposals will be approved by ILC-Lab, not by Pre-lab
- This statement seems reasonable: ILC Lab is responsible for ILC construction
- So far, we have assumed approval of detector technical proposals will take place 2 years before the start of ILC construction (Ground Breaking), and constructed the timeline of ILD assembly based on this assumption
- But in the reality, the completion of ILD assembly will be delayed by ~3 years (if the proposal is approve 1 y after GB)

Pre-lab physics and detector activities

- **Preparing the ILC physics programme** by
 - setting up the ILC Committee (ILCC) as a programme committee for the ILC at the start of the Pre-lab.
 - Call for Expressions of Interest (EoIs) after ~0.5 year for experiments covering a broad physics spectra which can be done at the ILC.
 - Call for Letters of Intent (LoIs) about one year after the EoIs. The ILCC will select a subset of LoIs to proceed for the next step.
 - Call for a Technical Proposal/Technical Design Report shortly before the transition to the ILC Laboratory, where the final approval of the experiments will be made by the ILC Laboratory.
- **Approving and monitoring of the progress for the detector R&D programme** by the ILCC.
- **Organising occasional physics workshops** to reflect on the on-going progress relevant for the ILC physics.

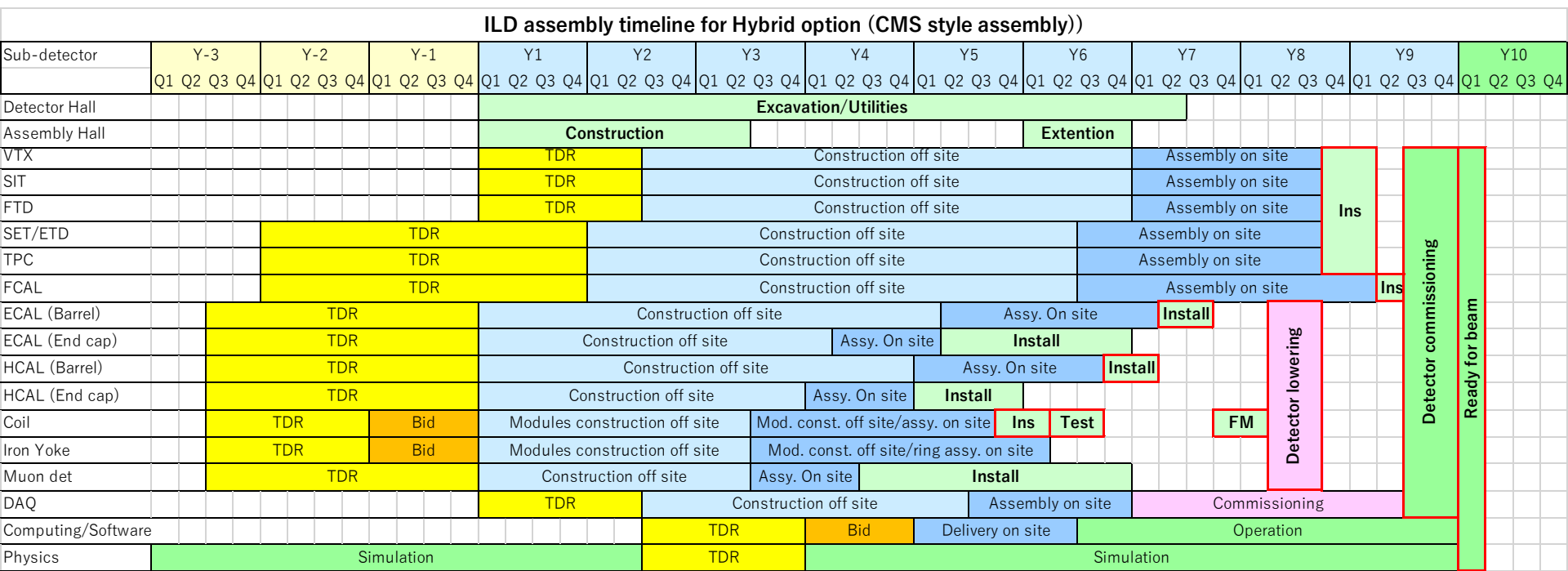
This timeline is the current IDT thoughts and the actual implementation will be led by the Pre-lab directorate

(See the afternoon plenary session on Thursday 22nd with Google Doc question possibility)

T. Nakada, 6

Impact on the ILD Timeline

- Completion of solenoid assembly/installation will be delayed by ~3 years
- It is impossible to make the detector assembly period shorter only by re-configuration of order of sub-detector installation
- If the start of solenoid construction is delayed by 3 years, coil winding on site (AH) can be an option (So far, we have assumed coil winding at the factory)



How to catch up with the Acc. schedule

- Bonus of 1 year
 - We thought the ILC design change from 500GeV to 250GeV could make the accelerator construction period (originally, 9 years for construction + 1 year for commissioning) shorter by 1 year
 - Therefore, we made the ILD assembly schedule completed in 9 years, including detector commissioning (see previous page)
 - But acc. construction period does not seem to become shorter
 - So we have 1 year margin
- Reconsideration of solenoid assembly period
 - Coil winding on site could make the assembly period shorter
 - If we discard the anti-DID, we can reduce the construction period (and cost) → $L^*=6\text{m}$ is an attractive option
- Reconsideration of installation period of barrel sub-detectors
 - We might be able to squeeze ~1 year by reducing the installation period of each sub-detector by ~30% (6 month → 4 month for each)
- Quick approval of detector proposals
 - If the proposals are approved just after the start of ILC-Lab, we can get another 1 year

Other concerns

- Possible additional delay
 - Collaboration formation and decision of work sharing
 - Acquisition of budget in each country after approval of the detector proposal
 - ...
- Design of Detector Hall
 - Design of the detector hall depends on the detector size
 - The detailed design of DH has to be fixed before ground breaking, but the approved detectors are not decided at that time
 - Imposing detector size similar to ILD and SiD on the detector candidates at the detector proposal call?

Summary

- Realistic timeline proposed by IDT, in which detector proposals are approved after establishment of ILC-Lab, could delay the detector assembly schedule by 3 years
- In order to get ready for beam in 10 years, each sub-detector group should reconsider assembly schedule (solenoid) or installation period
- We hope detector proposals are approved as soon as ILC-Lab is established

History of CMS

- 1993 LOI approved
- 1994 **Technical Proposal (~250 p) approved**
- 1996 Approved to move to construction
- 1997 **The Magnet Project TDR (~290 p)**
- 1998 MoU for construction
- 1998 **Construction started after approval of sub-system TDRs**
- 1999 **Coil design frozen**
- 2000 CMS assembly in assembly building started
- 2002 **Coil modules construction started at the factory**
- 2004 Underground cavern completed
- 2004 **Connection of modules started at assembly building**
- 2005 **Insertion of solenoid coil into vacuum vessel**
- 2006 **Coil cooled down and exited to 4T**
- 2006-2007 Detector lowering
- 2007 Barrel sub-detectors installation
- 2008 **Ready for beams**
- 2009 First collisions



14 years

BACKUP SLIDES

新しいTimeline (1)

- 鋤入れの1年後にプロポーザルが採択され、その半年後にTDRが承認され、その1年後に入札・契約が完了すると仮定すると
 - AH完成からソレノイド組立開始まで3年+1Q
 - 鋤入れから約9年でソレノイドインストール完了
 - 完成は3年遅れ

	2020/10/23	-6	-5	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11		
Organization		IDT		Pre-Lab.			ILC Lab.													
Status		Pre-preparation		Preparation			Construction/Commissioning													
Due process							Det. Proposal	Sub-det. TDR												
On-site (Surface)								Land devel.	Assembly hall construction											
On-site (Underground)								Detector Hall, Access tunnel construction												
Solenoid/DID	R&D		R&D			R&D														
	TDR							TDR												
	Bidding								Bidding											
	Assembly off-site								Assembly off-site											
	Assembly on-site										Assembly on-site									
	Installation													Installation						
	Full current test																	Full current test		

新しいTimeline (2)

- ソレノイドの建設期間を最小限に
- ソレノイドの入札・契約期間を半年短縮
 - 仕様書の作成はTDRと同時にやっておく
- → 完成は2年遅れ

	2020/10/23	-6	-5	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11		
Organization		IDT		Pre-Lab.				ILC Lab.												
Status		Pre-preparation		Preparation				Construction/Commissioning												
Due process							Det. Proposal	Sub-det. TDR												
On-site (Surface)								Land devel.	Assembly hall construction											
On-site (Underground)								Detector Hall, Access tunnel construction												
Solenoid/DID	R&D		R&D				R&D													
	TDR							TDR												
	Bidding								Bidding											
	Assembly off-site									Prep.	M1	M2	M3							
	Assembly on-site												Assembly on-site							
	Installation																		Installation	
	Full current test																			Full current test