Summary of the Integration Task Force kick-off (Orsay, Feb. 2, 2018)

Paul Colas

Document on ILD Conventions and rules

ILD conventions and rules Template

Ref. : ?????
Ed. : 0
Rev. : 3
Date: 21/10/16 Page : 1/8

ILD conventions and rules

ILD

Prepared by	Signature	Accepted by	Signature
Roman Pöschl			

Approved by	Function	Date	Signature

Summary	
Annexes	

Document Change Record

Edition	Revision	Date	Modified pages	Observations
0	1	21/10/16	all	Creation

Distribution	See Distribution list at the end of this document

Obligatory document:
Author: Central Integration Group

Actual ICD

Interface Control Document Template

Ref. : 1
Ed. : 1
Rev. : 0
Date:
Page : 1/9

Interface Control Document Template

XXXXXXXX (Sub detector name)

Prepared by	Signature	Accepted by	Signature

Approved by	Function	Date	Signature

Summary	
Annexes	

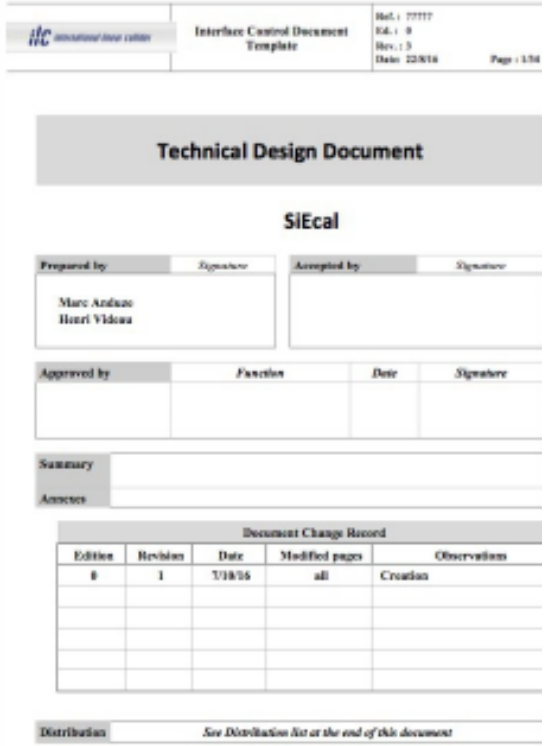
Document Change Record

Edition	Revision	Date	Modified pages	Observations
1	0			

Distribution	See Distribution list at the end of this document

Obligatory document
Author: Subdetector group

Technical Design Docum of subdetector



Interface Control Document Template

Ref. : ?????
Ed. : 0
Rev. : 3
Date: 22/8/16 Page : 1/34

Technical Design Document

SiEcal

Prepared by	Signature	Accepted by	Signature
Marc Anduze Henri Videau			

Approved by	Function	Date	Signature

Summary	
Annexes	

Document Change Record

Edition	Revision	Date	Modified pages	Observations
0	1	7/10/16	all	Creation

Distribution	See Distribution list at the end of this document

Optional document
(Highly recommended)
Author: Subdetector group
-> See talks by Henri and Marc

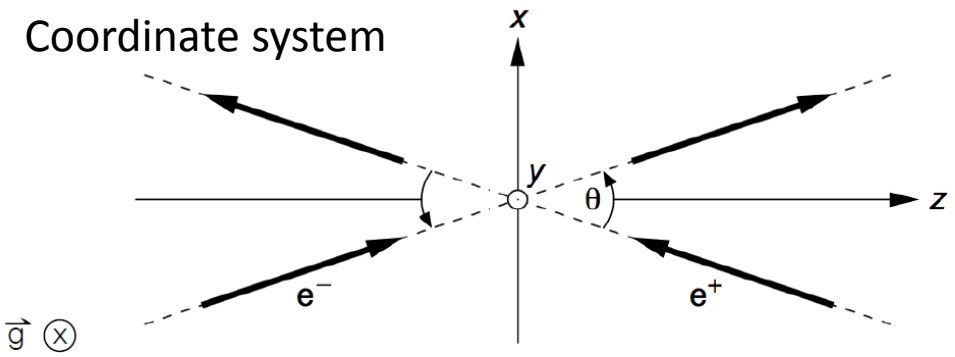
- ILD conventions and rules (Karsten Büsser and Roman Pöschl)
- Services/Utilities for detectors (Y. Sugimoto)
- Status of Interface Control Documents (VDET, TPC, SiTracker, SiECAL, ScECAL, AHcal, DHcal) in red: no draft yet
- Services

Definition of Names and Units

- Common set of sub-detector acronyms
- Naming conventions should be observed

Measure	Unit
Dimension	mm
Angle	mrad
Magnetic field	Tesla (T), Gauss (G) where appropriate; 1 T = 10000 G
Mass	kg
Pressure	Pa
Electric Voltage	V
Electric Current	A
Electrical Power	W
Liquid/gaseous volumes	l
Mechanical forces	N

Coordinate system



Detector Name	Acronym
Calorimeters	
Silicon Tungsten electromagnetic calorimeter	SiECAL
Scintillator Tungsten electromagnetic calorimeter	ScECAL
Analogue hadron calorimeter	AHCAL
Semi-digital hadron calorimeter	SDHCAL
Beampipe calorimeter	BeamCal
Luminosity calorimeter	LCAL
Luminosity calorimeter hadronic part	LHCAL
Central and forward Trackers	
Time Projection Chamber	TPC
Forward Tracking Disks	FTD
CMOS Vertex Detector	VTX-CMOS
FPCCD Vertex Detector	VTX-FPCCD
DEPFET Vertex Detector	VTX-DEPFET
External systems and Beam Pipe	
Iron Yoke	Iron Yoke
Muon system	Muon System
Beampipe	Beampipe

Inter-detector constraints : subdetector envelope, services, heat, EMI…
This is the role of the interface documents and maybe, later a specific document.
Transport and legal issues: 25 tons for a normal, 80 tons for an exceptional

External Constraints

- External constraints, e.g. from site-specific design of experimental areas need to be respected
- Co-operation between ILD (CDI group), ILC CFS, local experts, LCC MDI is required

4. CONSTRAINTS GIVEN BY THE EXPERIMENTAL AREAS

In the current design, ILD will share common experimental infrastructure with another detector (SiD). Both detectors will share a single interaction region in push-pull mode. For this, the detectors will be mounted on big platforms that allow for an exchange of the detectors within 24h. The functional requirements for such a situation have been discussed and laid down in an ILC document (ILC-Note-2009-050, EDMS D*1111835). A few direct requirements for the ILD design are derived from this:

- Alignment and vibration requirements for the QD0 magnets carried by ILD;
- Cryogenic requirements for the QD0 magnets;
- Requirements for the ILC beam feedback system, including BPMs, Kickers, etc.;
- Vacuum requirements for the beam pipe;
- Definition of beam hall geometries, including beam heights, etc.
- Requirements on magnetic environment, especially limits on stray fields outside of ILD. The global stray field of the magnetic field has to be less than 50 G at a location of 15m along the +/- x-axis at z=0.

The ILC Civil Facilities and Siting (CFS) group as well as local CFS and infrastructure experts are designing and defining the local infrastructure for the support of ILD. This includes geometries and location of the underground experimental facilities as well as the surface arrangements for construction, assembly and operations of the detectors.

The CDI group keeps a list of general ILD requirements that are important for the design of the experimental hall and the surface facilities (EDMS D*1156355). Any negotiations between the local/LCC CFS experts on the infrastructure requirements are done via the LCC MDI group or the ILD CDI team.

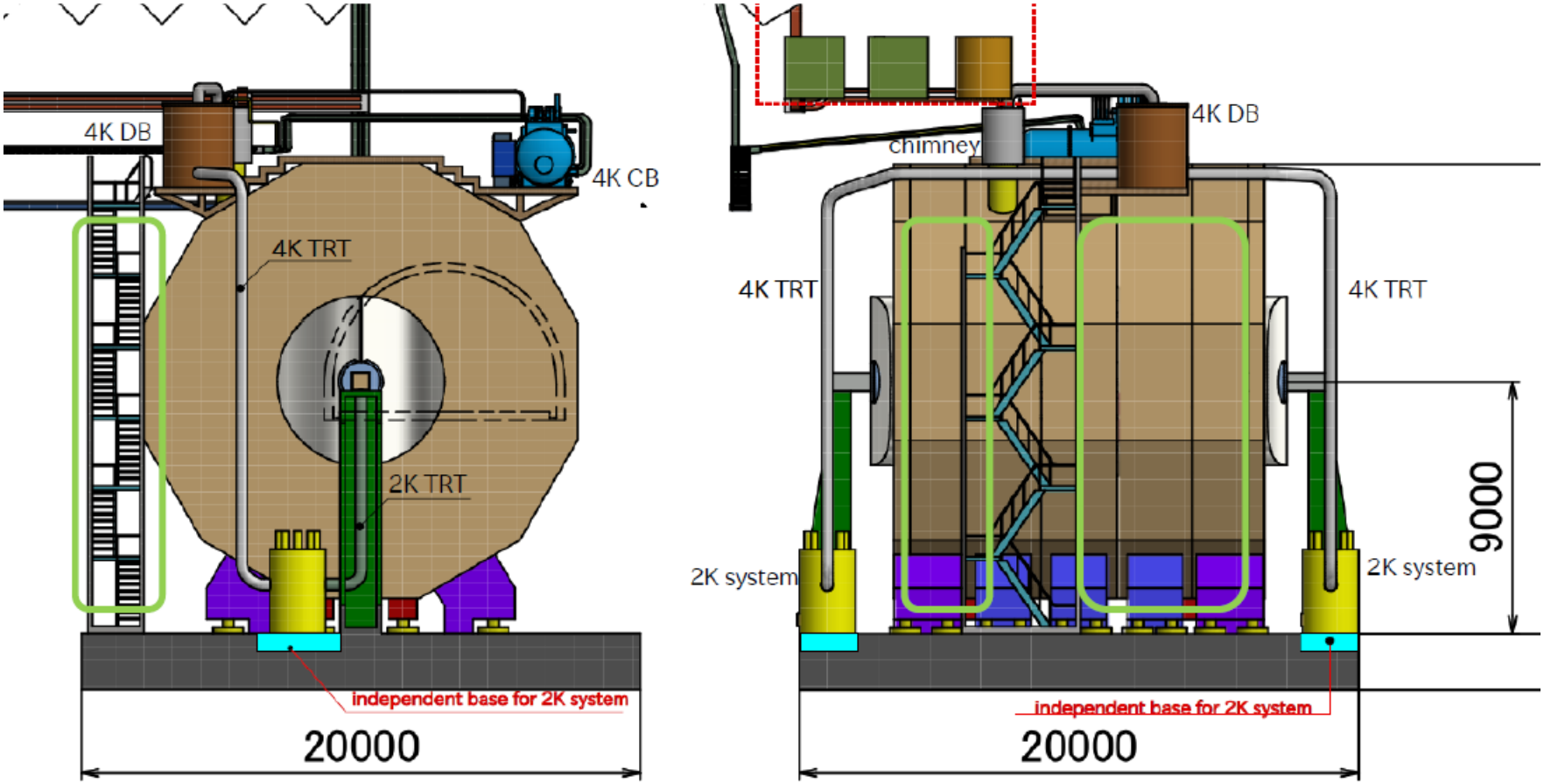
Specific requirements from ILD subdetectors or components on the experimental infrastructures should be discussed with the CDI team.

Karsten Buesser - ILD Integration Meeting - 02.02.2018 9

Location for Utility/Service

- Detector platform
  - Small number of electronics racks (mainly for low-voltage power supply), as well as cryogenics for the detector magnet, can be placed on the detector platform
  - Pay attention to the stray filed (~100 G, much stronger when iron of the return yoke is reduced)
- Service gallery
  - 5 levels of service/utility gallery are planned to be built on the DH wall
  - 3 levels of them can be used to place electronics racks
- Utility/Service cavern
  - Utilities: Transformer (6.6kV→400/200/100V), heat exchangers and pumps for cooling water
  - Sub-detector cooling system
  - Laser system, gas system, workshop, cryogenics for QF1, WC
- Surface
  - Gas storage
  - Compressors (for He and air)
  - Ventilation system

Detector Platform



4

Items to be clarified

- An excel file for survey is under construction

			VTX	SIT	FTD	TPC	ECAL	AHCAL	SDHCAL	Muon	FCAL	PC farm	Off-line	Solenoid	QF1
Electronics Racks	Platform	Number													
		AC power (kW)													
		Heat loss (kW)													
	Service gallery	Number													
		AC power (kW)													
		Heat loss (kW)													
	U/S cavern	Number													
		AC power (kW)													
		Heat loss (kW)													
	Surface	Number													
		AC power (kW)													
		Heat loss (kW)													
Sub-detector cooling system	Space requirement	Location													
		WxDxH (m^3)													
		AC power (kW)													
	Cooling water	Type													
		Heat load (kW)													
Gas system	Platform	WxD (m^2)													
	Service gallery	WxD (m^2)													
	U/S cavern	WxD (m^2)													
	Surface	WxD (m^2)													
Laser system	Space requirement	Location													
		WxD (m^2)													
Magnet ancillaries	DC power supply	AC power (kW)													
	Cooling water for power supply	Type													
		Heat load (kW)													
	Cryogenics	AC power (kW)													
	Space requirement	Location													
		WxDxH (m^3)													
	Cooling water for cryogenics	Type													
		Heat load (kW)													
	Cooling water for dump resister	Type													
		Heat load (kW)													