Coordination and support of common test beam experiments at DESY

Ties Behnke and Aura Rosca

AIDA 1st Annual Meeting
DESY, 27-30 March 2012

Test beam at DESY

- Hardware infrastructure: see separate talk
  - TPC in beam 24: table, etc
  - Telescopes
  - Calorimeter
- Management support: EDMS (this talk)

Outline

- What is an EDMS?
- Aim of the Technical Design Documentation (TDD)
- Overview of EDMS Key Features
- As Example, TPC Large Prototype Documentation
- Summary

What is an EDMS?

- An Engineering Data Management System EDMS is a framework which provides functionality for purposes as:
  - Document Management
  - 3D CAD Data Management
  - Configuration, Version and Change Management
  - Workflow Management
  - Visualization and Digital Mock-up

Goals for AIDA

- Provide a central depository for the test-beam infrastructure with a focus on LC related tasks
- DESY test beam infrastructure
- CERN test beam infrastructure

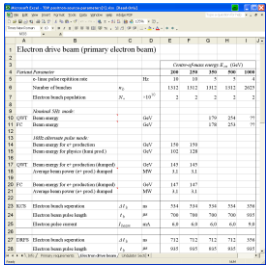
- Step 1: test the system, develop the specifications
- Step 2: setup a coherent system for AIDA

A Starting point: TDD, DBD and ILD-EDMS

DBD

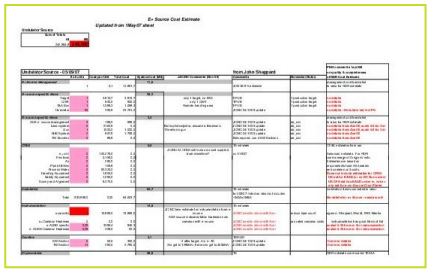
The Detector Baseline Design Report sums up the TDD ready for publication.

Technical Design Documentation captures entire design efforts, results and rationale

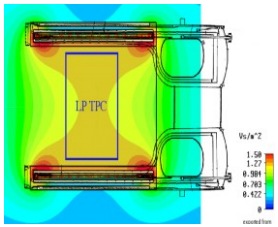


Parameters

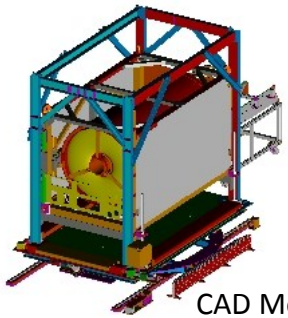
Specifications



Cost Estimation

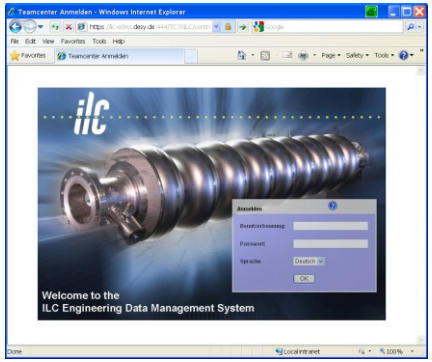


Calculations



CAD Models

...



The ILD-EDMS organizes the TDD through the provision of: structure, traceability, version, configuration and change management

We will use this as a starting point for a more general EDMS for AIDA.

Objectives of ILD-EDMS

More effort, more benefit!

Document Persistency

Documents are stored in the EDMS in order not to get lost

Document Traceability and Consistency

Documents are stored in the EDMS and relationships between documents are drawn (A depends on B).

Document Traceability and Consistency during engineering phase

EDMS is integrated in the design process: dependencies between documents are used to make sure documents are correct, complete and consistent.

Purpose of EDMS

- The role of EDMS:
  - Collect all relevant technical documentation, make all information persistent.
- Proposed policy:
  - Put in as many documents as possible, including presentations documenting the design;
  - Make documents available to registered EDMS users (flag as released), be as open as possible, restrict access where necessary;
  - Official documents defining the baseline are put into Work Breakdown Structure nodes (quality controlled) and need to be approved by Management.

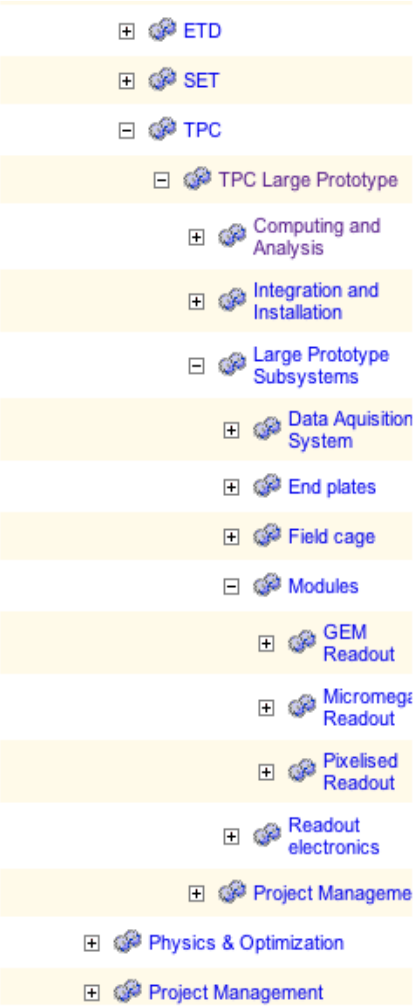
A Look Inside the EDMS

Example: list of items

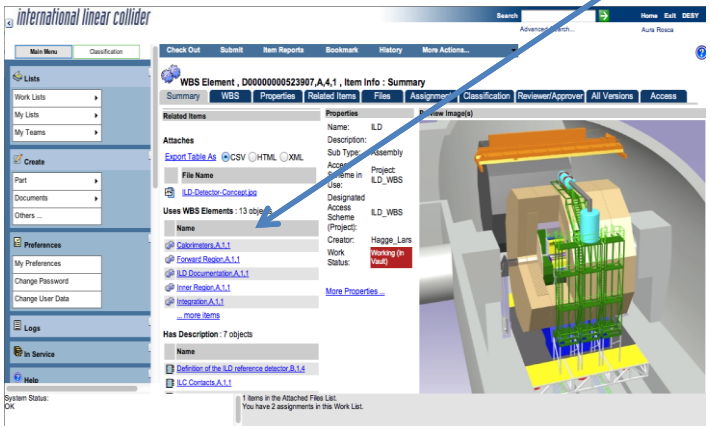
Example: TPC infrastructure

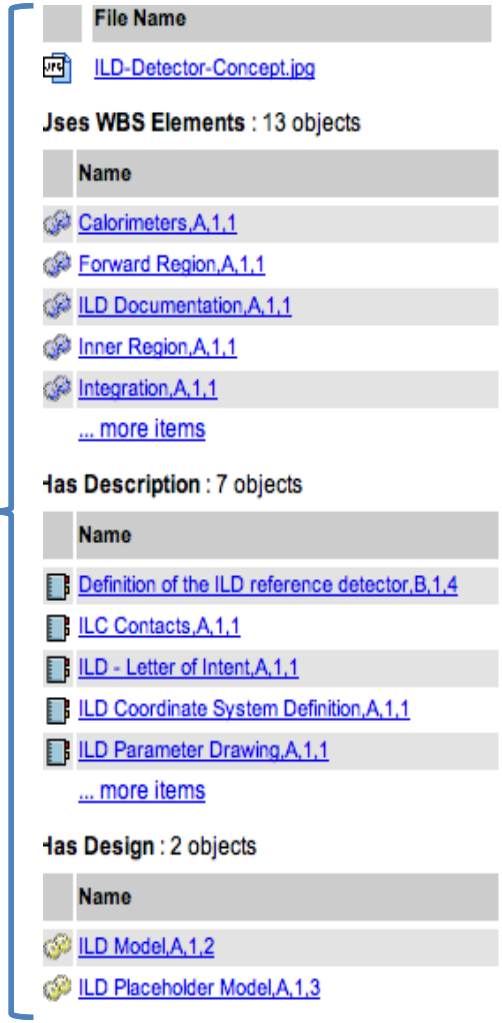
EDMS interface is fully Web based.

Overview of the TDD structure



- Implement a standardized and generally accepted Work Breakdown Structure (WBS)
- Aggregate documentation at each WBS element
  - Need to define mandatory documents to be provided at each node
- Signoff documentation for correctness, consistency and completeness





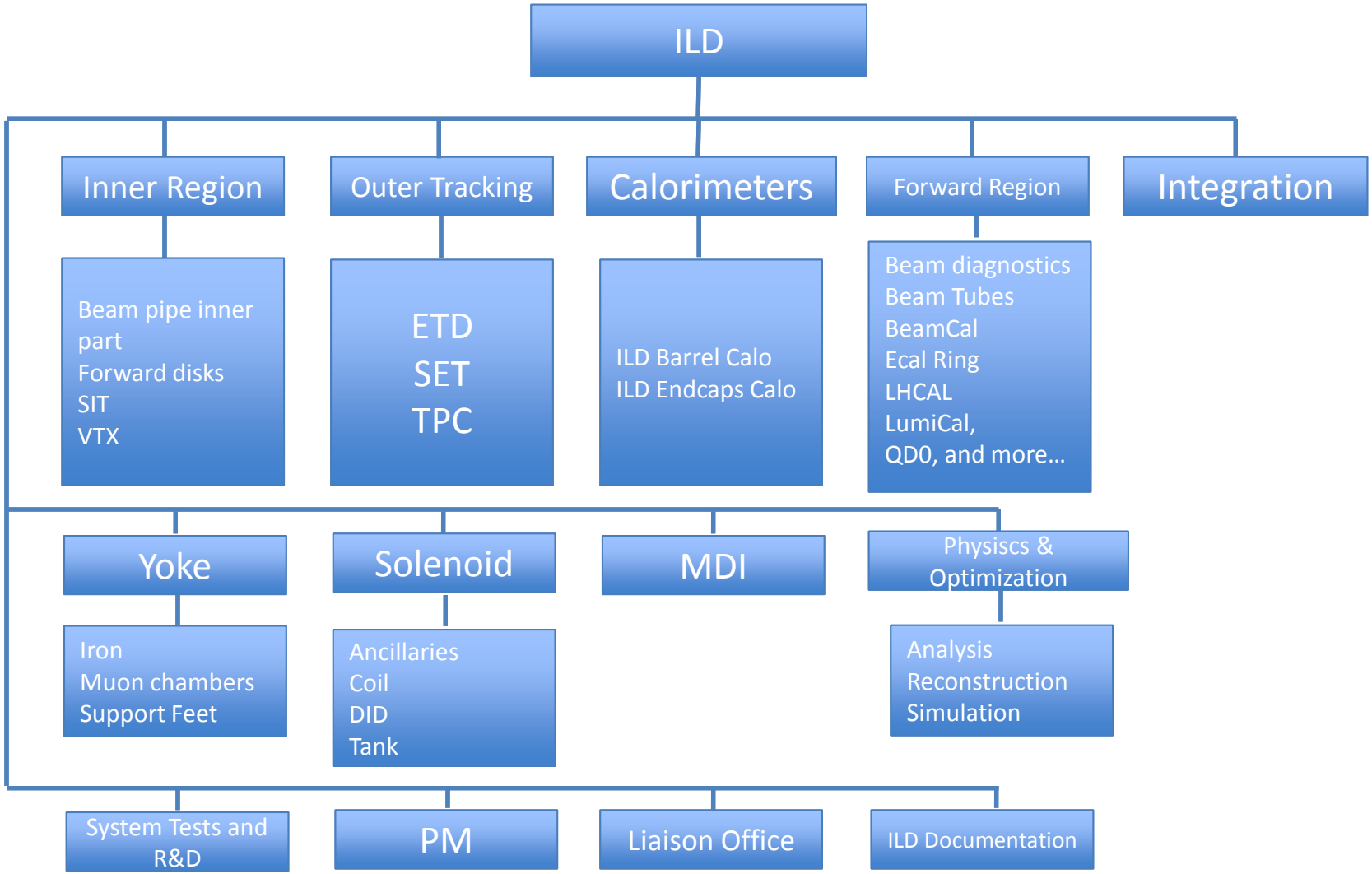
Mandatory Documents

- Documents that should be prepared for all WBS nodes:
  - Parameter lists
  - Detector description
  - Component lists
  - Component specifications
  - Calculations

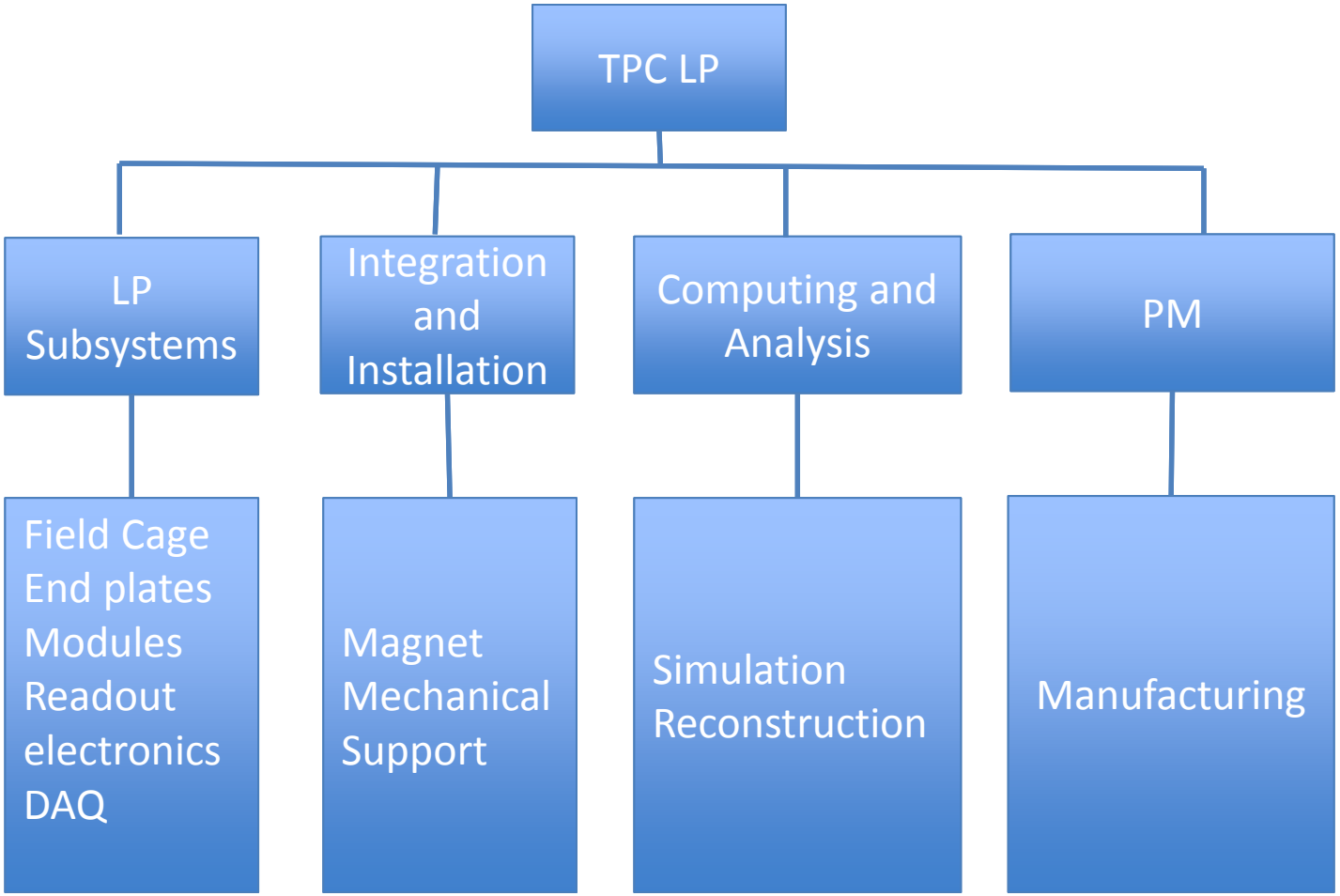
Work Breakdown Structure

- WBS provides hierarchical structure for the most relevant documents, related to the official baseline.
- WBS is quality controlled: New nodes and documents are placed there centrally (EDMS team, approved by management).
- WBS will only contain one version of any document.
- Documents to go into WBS needs formal approval by management.
- WBS is a Work Breakdown Structure, it contains not only physical components of the machine, but also tasks like „Project Management“.

Example: ILD WBS



TPC Large Prototype WBS



TPC LP WBS in EDMS

international linear collider

Search ILD* Home Exit DESY
Advanced Search... Aura Rosca

- ETD
- SET
- TPC
  - TPC Large Prototype
    - Computing and Analysis
    - Integration and Installation
    - Large Prototype Subsystems
      - Data Aquisition System
      - End plates
      - Field cage
      - Modules
        - GEM Readout
        - Micromega Readout
        - Pixelised Readout
      - Readout electronics
    - Project Manageme
- Physics & Optimization
- Project Management

Missing Plug-in

Missing Plug-in

Check Out | Submit | Item Reports | Bookmark | History | More Actions...

WBS Element , D00000000546957,A,1,1 , Item Info : Summary

Summary | WBS | Properties | Related Items | Files | Assignment | Classification | Reviewer/Approver | All Versions | Access

Related Items

Attaches

Export Table As (•)CSV ( )HTML ( )XML

	File Name
	lp1_pcmag_stage1.jpg

Uses WBS Elements : 4 objects

	Name
	Computing and Analysis,A,1,1
	Integration and Installation,A,1,1
	Large Prototype Subsystems,A,1,1
	Project Management,A,1,1

Is used by WBS Element : 1 object

	Name
	TPC,A,1,1

Properties

Name:	TPC Large Prototype
Description:	Technical design documentation for the TPC Large Prototype of the ILD detector
Sub Type:	Assembly
Access Scheme in Use:	Project: ILD_WBS
Designated Access Scheme (Project):	ILD_WBS
Creator:	Rosca_Aura
Work Status:	Working (in Vault)

More Properties ...

Preview Image(s)

Item Status:

1 items in the Attached Files List.
There might be more items that match your search criteria.
Query successful.. 500 rows returned.
2 items in the Attached Files List.
Query successful.. 3 rows returned.

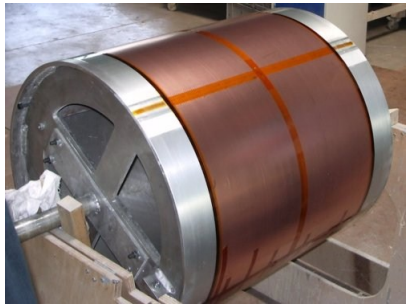
Ideally each WBS node contains similar set of documents.

TPC Large Prototype WBS

D00000000547037,A,1,1	Large Prototype Subsystems	Technical design documentation of subsystems of the TPC Large Prototype for the ILD detector	
D00000000549227,A,1,1	Data Aquisition System	Technical design documentation of the DAQ of the TPC Large Prototype for the ILD detector	1
D00000000549007,A,1,1	End plates	Technical design documentation of the end plates of the TPC Large Prototype for the ILD detector	1
D00000000547347,A,1,1	Field cage	Technical design documentation of the field cage of the TPC Large Prototype for the ILD detector	1
D00000000549077,A,1,1	Modules	Technical design documentation of the modules of the TPC Large Prototype for the ILD detector	1
D00000000549507,A,1,1	GEM Readout	Technical design documentation of the GEM readout of the TPC Large Prototype for the ILD detector	1
D00000000549577,A,1,1	Micromegas Readout	Technical design documentation of the micromegas readout of the TPC Large Prototype for the ILD detector	1
D00000000549647,A,1,1	Pixelised Readout	Technical design documentation of the pixelised readout of the TPC Large Prototype for the ILD detector	1
D00000000549147,A,1,1	Readout electronics	Technical design documentation of the readout electronics of the TPC Large Prototype for the ILD detector	1

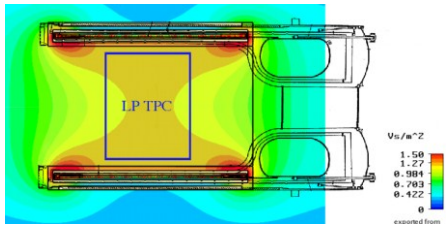
Work Breakdown Structure provides hierarchical structure for organizing the activities.

Example:Traceability



Field Cage

TPC Large Prototype



Magnetic Field

EUDET-Memo-2008-17

The Linear Collider TPC:
Revised Magnetic-field Requirements *

R. Settles[1] W. Wiedemann[2]

August 2008

Abstract

A Time Projection Chamber is being developed as central tracker for a detector at the International Linear Collider. The LCTPC has to perform better and to face more complicated event topologies and higher backgrounds than TPCs at previous e^+e^- colliders; this puts additional requirements on the overall system design. At present the technical design of the ILC machine is considering the use of special magnetic-field elements to guide the beams as they pass along the axis of the detector. Since the B-fields from such elements affect the TPC volume, the present note revisits the requirements on the magnetic field for the LCTPC. It is proposed to replace the original requirement on the homogeneity of the B-field by one on the accuracy of the B-field map. The purpose of this study is to achieve the best possible momentum resolution for the TPC, and it is demonstrated that the goal for the Aleph B-map accuracy is also sufficient for the LCTPC. Simulations should be made to cross-check these ideas and results communicated via memos or notes.[1]

*This work is supported by the Commission of the European Communities under the 6th Framework Programme "Structuring the European Research Area", contract number RII3-026126. This EUDET memo is also published as LC-DET-2008-002 at http://www-flc.desy.de/lcnotes and ILC-NOTE-2008-040 at http://linbe.linearcollider.org/.

[1]Max Planck Institut für Physik, Föhringer Ring 6, D-80805 Munich, Germany

[2]c/o Physics Department, University of Wisconsin at Madison, CERN PH Division, CH-1211 Geneva, Switzerland

[1]A draft of this note was originally written at Snowmass2005:[][]. The description of machine issues has been updated due to progress in the meantime. The original discussion on the TPC B-field has been revised considerably here. In particular we decided not, as in the original draft, to use back of the envelope models to estimate the effects, because of their approximate nature leading to not so clear conclusions, but instead to employ real results from Aleph to derive the requirements for the LCTPC.

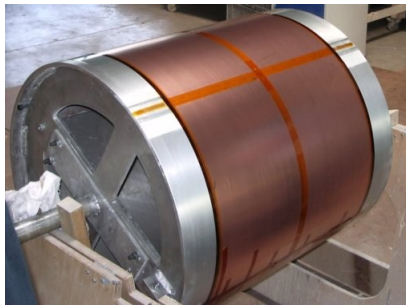
1

Magnetic field requirements

1 → is-used-by → 2 → depends-on → 3 → is-described-by →

Traceability is the foundation for consistency of documents.

Propagating Changes



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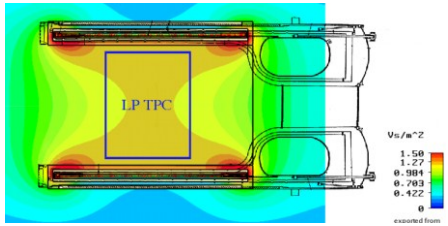
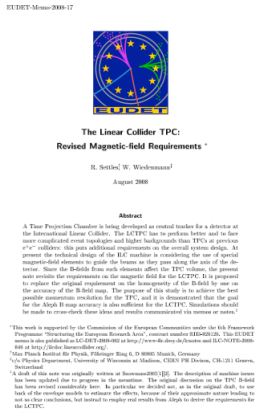


Magnetic Field



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Magnetic field requirements

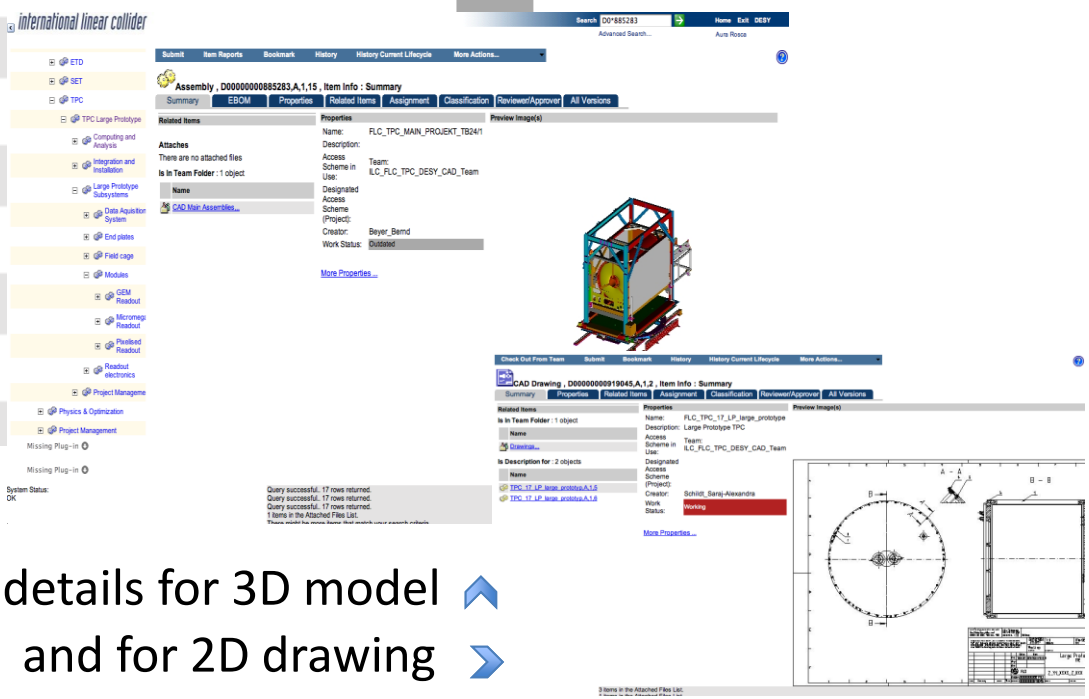
1 is-used-by 2 depends-on 3 is-described-by

- What happens if for instance the magnetic field changes
  - Create new version of magnetic field map
  - TPC Large prototype points to the old version
    - Needs update, check if field cage still fits the LP
  - Traceability helps to (re-)establish consistency

Example: A CAD Model

D00000000885283,A,1,15	FLC_TPC_MAIN_PROJEKT_TB24/1			Outdated	
D00000000884873,A,1,1	TPC_01_HF_hall_facilities		1	Outdated ea	0
D00000000884873,A,1,2	TPC_01_HF_hall_facilities		1	Outdated ea	0
D00000000884873,A,1,3	TPC_01_HF_hall_facilities				
D00000000884873,A,1,4	TPC_01_HF_hall_facilities				
D00000000884873,A,1,5	TPC_01_HF_hall_facilities				
D00000000884873,A,1,6	TPC_01_HF_hall_facilities				
D00000000884873,A,1,7	TPC_01_HF_hall_facilities				
D00000000884873,A,1,8	TPC_01_HF_hall_facilities				
D00000000884303,A,1,1	TPC_02_BG_bottom_guidance				

design view from 3D CAD



Item details for 3D model

and for 2D drawing

3D CAD systems create design view of components

Summary

- Available Technical Design Documentation is still few, but it is growing and is gaining structure
  - TPC Large Prototype documentation was a good exercise which we can dwell on.
- Next step: develop a coherent plan within WP8.6 together with CERN on how to proceed.