Collaborative Engineering Supported by EDMS.

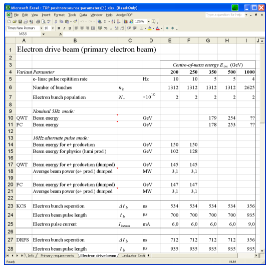
How EDMS helps to synchronize engineering and simulation models.

Benno List DESY -IPP-
ILD Integration Workshop, LAL, Orsay
20.4.2011

TDD, TDR and ILC-EDMS

Technical Design Report (TDR) summarizes TDD for publication

Technical Design Documentation (TDD) captures entire design efforts, results & rationale

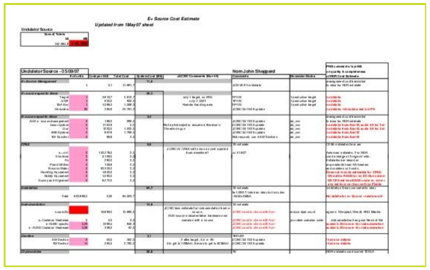


Microsoft Excel - TDP positron-source-parameters[1].xlsx [Read-Only]

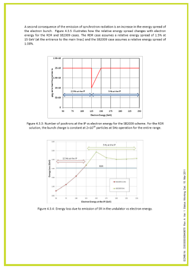
	A	B	C	D	E	F	G	H	I
1	Electron drive beam (primary electron beam)								
2									
3					*Centre-of-mass energy* E_{cm} (GeV)				
4	*Variant*	*Parameter*			**200**	**250**	**350**	**500**	**1000**
5		e- linac pulse repitition rate		Hz	10	10	5	5	4
6		Number of bunches	n_b		1312	1312	1312	1312	2625
7		Electron bunch population	N_+	$\times10^{10}$	2	2	2	2	2
8									
9		*Nominal 5Hz mode:*							
10	QWT	Beam energy		GeV			179	254	??
11	FC	Beam energy		GeV			178	253	??
12									
13		*10Hz alternate pulse mode:*							
14		Beam energy for e+ production		GeV	150	150			
15		Beam energy for physics (lumi prod.)		GeV	102	128			
16									
17	QWT	Beam energy for e+ production (dumped)		GeV	145	145			
18		Average beam power (e+ prod.) dumped		MW	3,1	3,1			
19									
20	FC	Beam energy for e+ production (dumped)		GeV	147	147			
21		Average beam power (e+ prod.) dumped		MW	3,1	3,1			
22									
23	KCS	Electron bunch seperation	Δt_b	ns	534	534	534	534	356
24		Electron beam pulse length	t_b	µs	700	700	700	700	935
25		Electron pulse current	I_{beam}	mA	6,0	6,0	6,0	6,0	9,0
26									
27	DRFS	Electron bunch seperation	Δt_b	ns	712	712	712	712	356
28		Electron beam pulse length	t_b	µs	935	935	935	935	935

Parameters

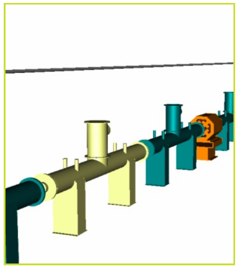
Specifications



Cost Estimation



Calculations



CAD Models

Positron Source Overview

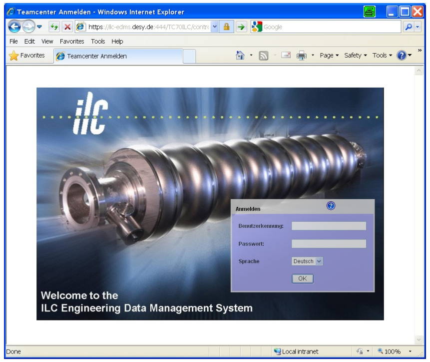
Release 1.1

December 2009

ILC Global Design Effort

Design Summary

…



Teamcenter Anmelden - Windows Internet Explorer

https://ilc-edms.desy.de:444/TC70ILC/contr

Anmelden

Benutzerkennung:

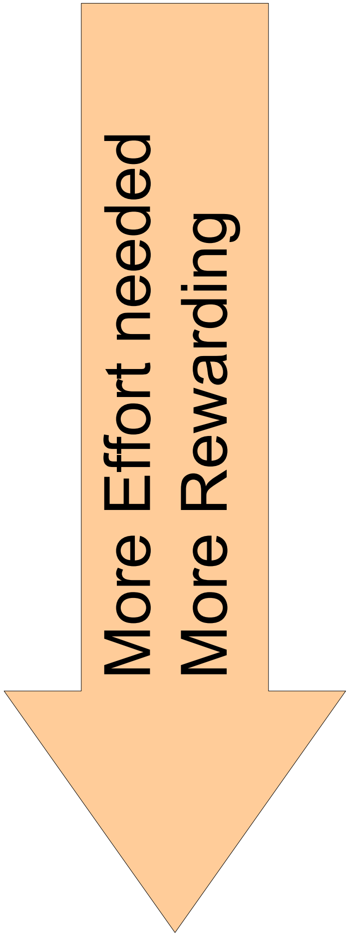
Passwort:

Sprache: Deutsch

Welcome to the
ILC Engineering Data Management System

ILC-EDMS organizes the Technical Design Documentation, providing **structure**, **traceability**, **version & configuration mgt.**, and **change control**

Goals of Using EDMS



More Effort needed

More Rewarding

Document Persistency

Documents are just „dumped“ into EDMS so they don't get lost

Document Traceability and Consistency a posteriori

Documents are dumped into EDMS and
Relationships between documents are drawn (A depends on B),

Document Traceability and Consistency during development

***EDMS is integrated in design process**: Dependencies between documents are used to make sure documents are correct, complete, consistent*

General Policy

- The general policy should be:

If someone else's work depends on results of your work:

Put it into EDMS

If you need input from someone else:

Demand that it is documented in EDMS

- Example: Requirements for ARUP: Write up a 1-page document with yesterday's findings, make it official and put it on EDMS

Role of EDMS

- The role of EDMS: Collect all relevant technical documentation, make it persistent beyond 2012
- Proposed policy:
  - Put in as many documents as possible,
    including presentations **documenting the design**
    [but do not aim to collect all talks, we don't want a copy of indico and ilcdoc]
  - **Make documents avaliable** to registered ILC EDMS users (mark as „released“), be as open as possible.
    restrict access where necessary (cost related)
  - **Official documents** defining the baseline are linked from **WBS** (quality controlled)
- We have defined ILD_XXX Teams and Projects;
  at the moment, released ILD documents are accessible by all ILC users
  → this **can be changed immediately**, just let me know!
- Documents within „Teams“ are restricted to Team members, i.e. essentially inaccessible!

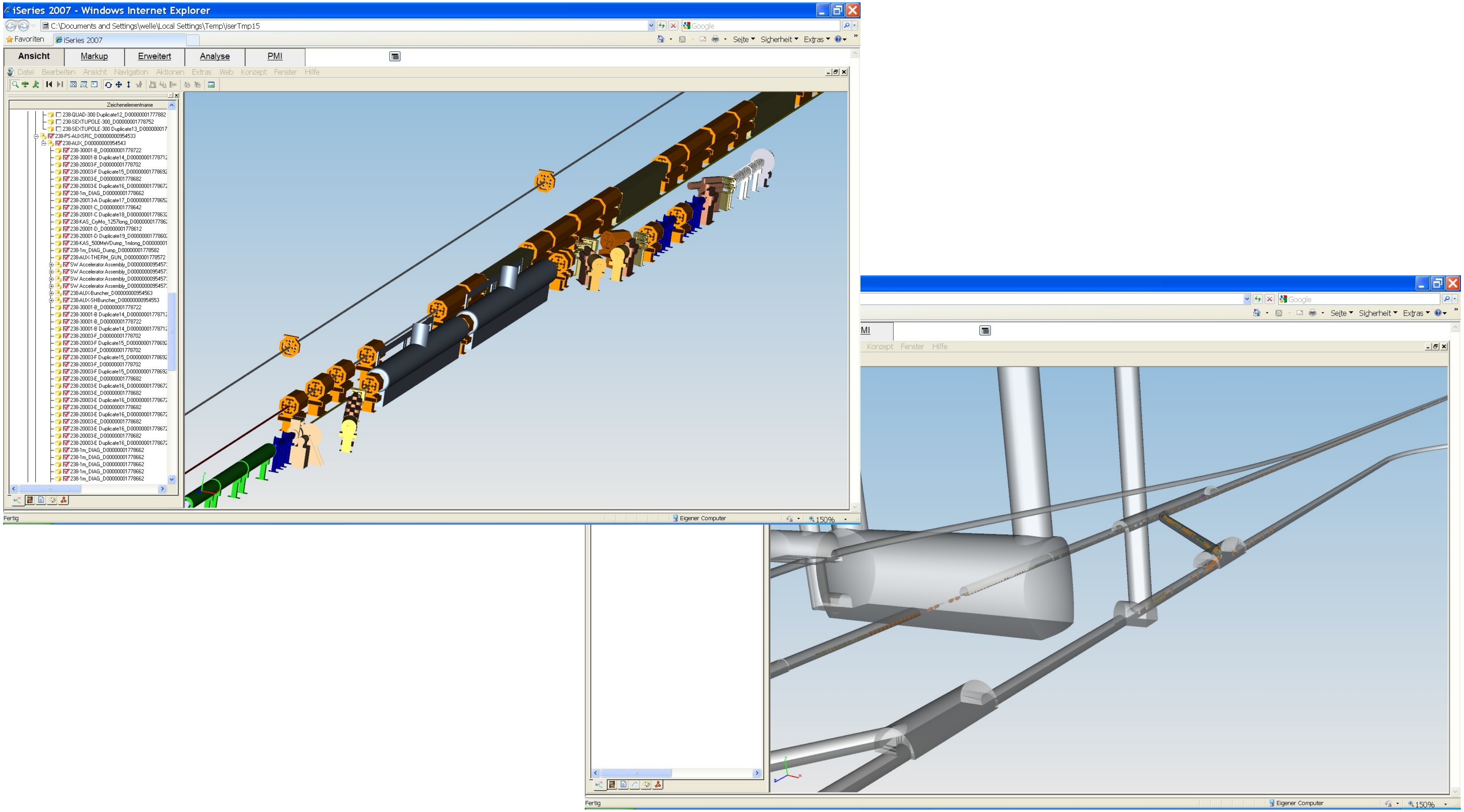
EDMS Contacts

- I have taken the liberty to have EDMS accounts created for several of you; please log in at least once and change the password
- For any questions, support etc:
  ipp-support@desy.de Central support
  Benno.List@desy.de Myself (don't hesitate to contact me!)
- We offer to put documents and CAD models into EDMS for you, just send us the files with a description:
  - Title / Name (human-readable, not a filename!)
  - Short description (about 1-2 sentences)
  - Author
  - Date

What is in EDMS: ILC

- For ILC GDE:
  Work on Technical Design Documentation has started
- Will have Technical Baseline Reviews, one for each Technical Area System, over next 12 months, and document the outcome in EDMS
- Done already for the Positron Source (February),
  next meeting will be in July for Damping Rings
- These reviews result in
  - more detailed information
  - may change global parameters (e.g. bunch timing!)
- → Look at the documents in EDMS to see what the status is!

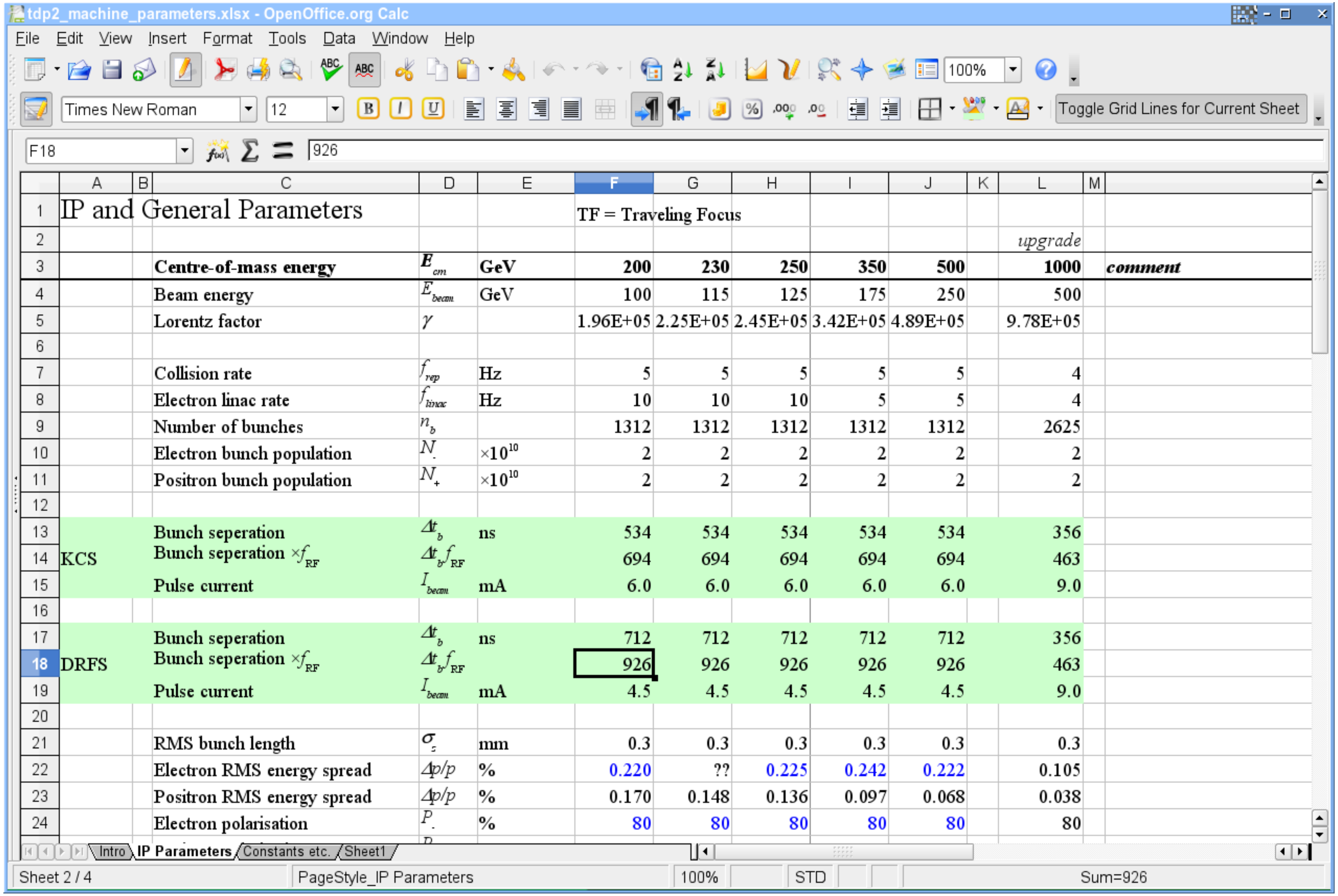
ILC Accelerator and Tunnel Models



Accelerator Components: D00000000954373

Tunnel model: D00000000955253

ILC Top Level Parameters

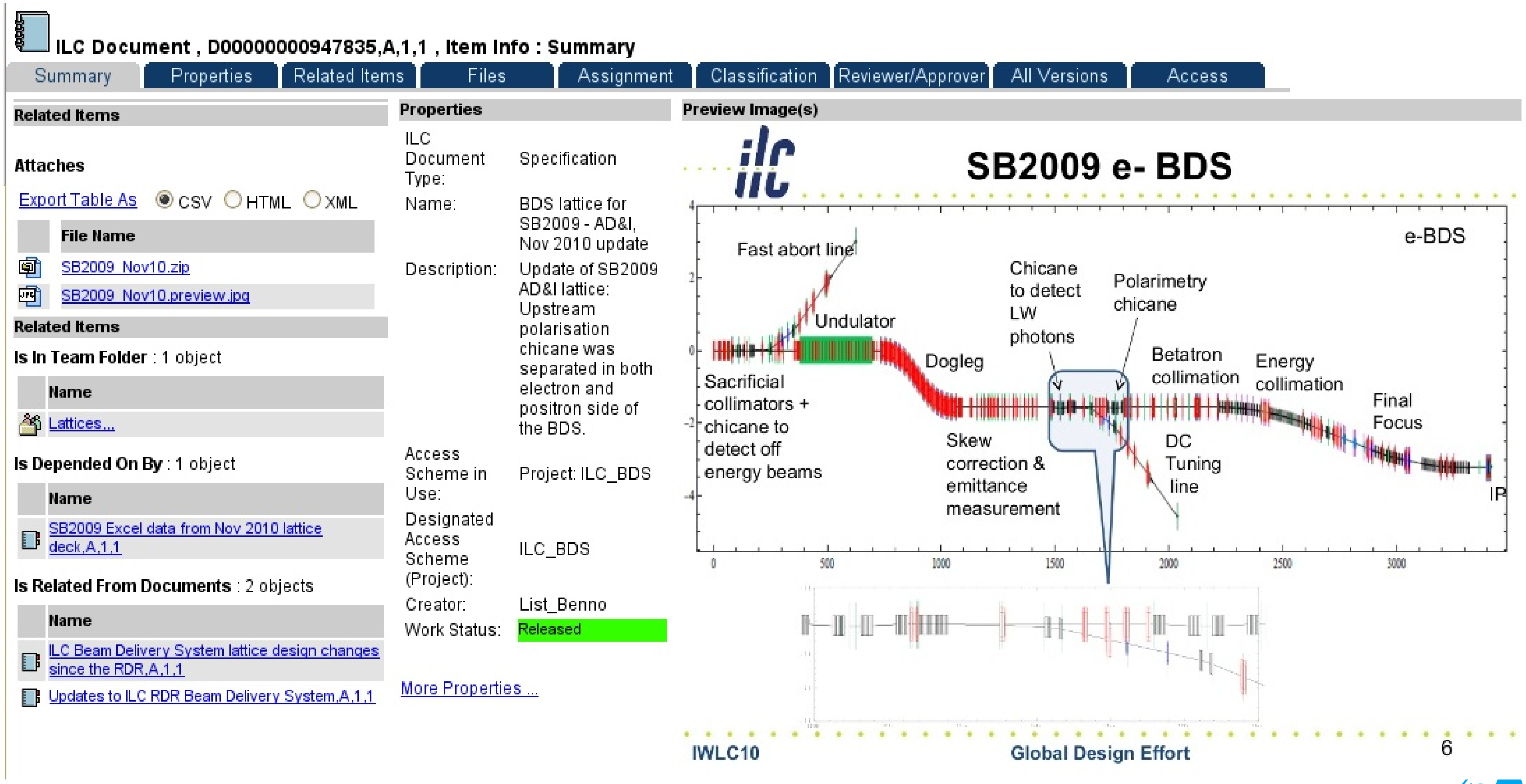


	A	B	C	D	E	F	G	H	I	J	K	L	M
1	IP and General Parameters					TF = Traveling Focus							
2												*upgrade*	
3			**Centre-of-mass energy**	E_{cm}	**GeV**	**200**	**230**	**250**	**350**	**500**		**1000**	***comment***
4			Beam energy	E_{beam}	GeV	100	115	125	175	250		500	
5			Lorentz factor	γ		1.96E+05	2.25E+05	2.45E+05	3.42E+05	4.89E+05		9.78E+05	
6													
7			Collision rate	f_{rep}	Hz	5	5	5	5	5		4	
8			Electron linac rate	f_{linac}	Hz	10	10	10	5	5		4	
9			Number of bunches	n_b		1312	1312	1312	1312	1312		2625	
10			Electron bunch population	N_-	$\times10^{10}$	2	2	2	2	2		2	
11			Positron bunch population	N_+	$\times10^{10}$	2	2	2	2	2		2	
12													
13			Bunch seperation	Δt_b	ns	534	534	534	534	534		356	
14	KCS		Bunch seperation $\times f_{RF}$	$\Delta t_b f_{RF}$		694	694	694	694	694		463	
15			Pulse current	I_{beam}	mA	6.0	6.0	6.0	6.0	6.0		9.0	
16													
17			Bunch seperation	Δt_b	ns	712	712	712	712	712		356	
18	DRFS		Bunch seperation $\times f_{RF}$	$\Delta t_b f_{RF}$		926	926	926	926	926		463	
19			Pulse current	I_{beam}	mA	4.5	4.5	4.5	4.5	4.5		9.0	
20													
21			RMS bunch length	σ_z	mm	0.3	0.3	0.3	0.3	0.3		0.3	
22			Electron RMS energy spread	$\Delta p/p$	%	0.220	??	0.225	0.242	0.222		0.105	
23			Positron RMS energy spread	$\Delta p/p$	%	0.170	0.148	0.136	0.097	0.068		0.038	
24			Electron polarisation	P_-	%	80	80	80	80	80		80	

Parameter List:: D00000000925325

ILC Lattices

- Lattice files from BDS are completely available from EDMS, including full MAD files, magnet lists etc.
- However: There is no complete lattice for push-pull. :-(



ILC Document , D00000000947835,A,1,1 , Item Info : Summary

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

Related Items

Attaches

Export Table As ● CSV ○ HTML ○ XML

	File Name
	SB2009_Nov10.zip
	SB2009_Nov10.preview.jpg

Related Items

Is In Team Folder : 1 object

	Name
	Lattices...

Is Depended On By : 1 object

	Name
	SB2009 Excel data from Nov 2010 lattice deck,A,1,1

Is Related From Documents : 2 objects

	Name
	ILC Beam Delivery System lattice design changes since the RDR,A,1,1
	Updates to ILC RDR Beam Delivery System,A,1,1

Properties

ILC Document Type:	Specification
Name:	BDS lattice for SB2009 - AD&I, Nov 2010 update
Description:	Update of SB2009 AD&I lattice: Upstream polarisation chicane was separated in both electron and positron side of the BDS.
Access Scheme in Use:	Project: ILC_BDS
Designated Access Scheme (Project):	ILC_BDS
Creator:	List_Benno
Work Status:	Released

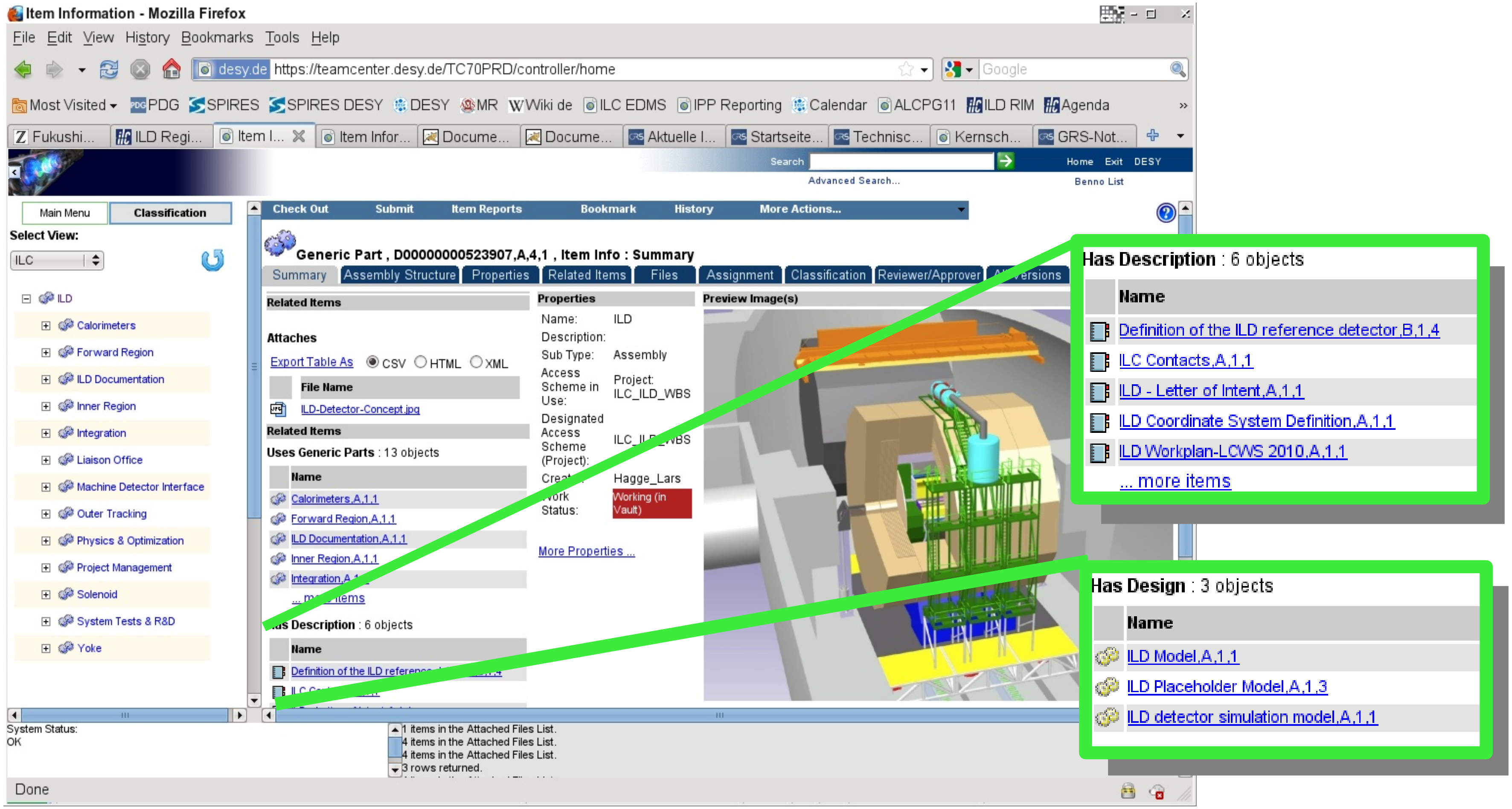
More Properties ...

Preview Image(s)

MDI and Experimental Hall Design

- There iare **ILD**_MDI_Team and ILD_MDI_CAD_Team for ILD-internal work on MDI
- There are also ILC_MDI_Team and ILC_MDI_CAD_Team for ILD/SiD and ILC common work on MDI and experimental hall issues
- Currently we have one (simple) hall model from Marco Oriunno in the ILC_MDI_CAD_Team.
  This should be a good place to exchange information on experimental hall issues between ILD and SID.

ILD Top Level WBS Node



- ILD
  - Calorimeters
  - Forward Region
  - ILD Documentation
  - Inner Region
  - Integration
  - Liaison Office
  - Machine Detector Interface
  - Outer Tracking
  - Physics & Optimization
  - Project Management
  - Solenoid
  - System Tests & R&D
  - Yoke

Generic Part , D00000000523907,A,4,1 , Item Info : Summary

Related Items

Attaches

Export Table As ● CSV ○ HTML ○ XML

	File Name
	ILD-Detector-Concept.jpg

Related Items

Uses Generic Parts : 13 objects

	Name
	Calorimeters,A,1,1
	Forward Region,A,1,1
	ILD Documentation,A,1,1
	Inner Region,A,1,1
	Integration,A,1
	... more items

Properties

Name:	ILD
Description:	
Sub Type:	Assembly
Access Scheme in Use:	Project: ILC_ILD_WBS
Designated Access Scheme (Project):	ILC_IL_WBS
Creat :	Hagge_Lars
Work Status:	Working (in Vault)

More Properties ...

Preview Image(s)

System Status: OK

1 items in the Attached Files List.
4 items in the Attached Files List.
4 items in the Attached Files List.
3 rows returned.

Done

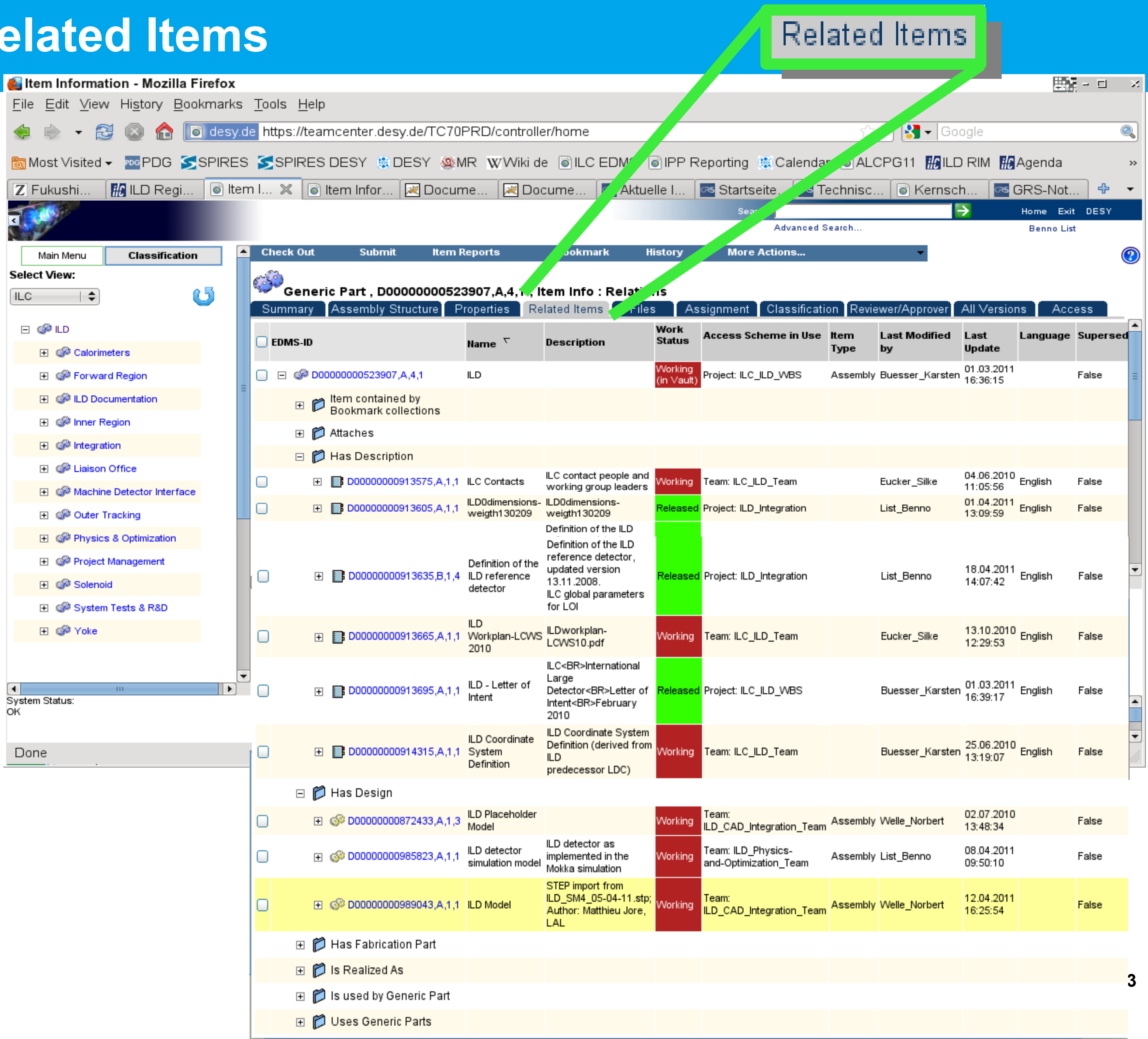
Has Description : 6 objects

	Name
	Definition of the ILD reference detector,B,1,4
	ILC Contacts,A,1,1
	ILD - Letter of Intent,A,1,1
	ILD Coordinate System Definition,A,1,1
	ILD Workplan-LCWS 2010,A,1,1
	... more items

Has Design : 3 objects

	Name
	ILD Model,A,1,1
	ILD Placeholder Model,A,1,3
	ILD detector simulation model,A,1,1

Related Items

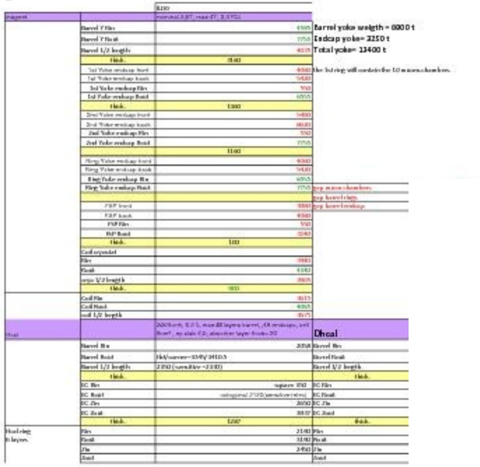


Generic Part , D00000000523907,A,4,1, Item Info : Relations

☐ EDMS-ID	Name	Description	Work Status	Access Scheme in Use	Item Type	Last Modified by	Last Update	Language	Supersed
☐ ⊟ D00000000523907,A,4,1	ILD		Working (in Vault)	Project: ILC_ILD_WBS	Assembly	Buesser_Karsten	01.03.2011 16:36:15		False
⊞ Item contained by Bookmark collections									
⊞ Attaches									
⊟ Has Description									
☐ ⊞ D00000000913575,A,1,1	ILC Contacts	ILC contact people and working group leaders	Working	Team: ILC_ILD_Team		Eucker_Silke	04.06.2010 11:05:56	English	False
☐ ⊞ D00000000913605,A,1,1	ILD0dimensions-weigth130209	ILD0dimensions-weigth130209	Released	Project: ILD_Integration		List_Benno	01.04.2011 13:09:59	English	False
☐ ⊞ D00000000913635,B,1,4	Definition of the ILD reference detector	Definition of the ILD Definition of the ILD reference detector, updated version 13.11.2008. ILC global parameters for LOI	Released	Project: ILD_Integration		List_Benno	18.04.2011 14:07:42	English	False
☐ ⊞ D00000000913665,A,1,1	ILD Workplan-LCWS 2010	ILDworkplan-LCWS10.pdf	Working	Team: ILC_ILD_Team		Eucker_Silke	13.10.2010 12:29:53	English	False
☐ ⊞ D00000000913695,A,1,1	ILD - Letter of Intent	ILC International Large Detector Letter of Intent February 2010	Released	Project: ILC_ILD_WBS		Buesser_Karsten	01.03.2011 16:39:17	English	False
☐ ⊞ D00000000914315,A,1,1	ILD Coordinate System Definition	ILD Coordinate System Definition (derived from ILD predecessor LDC)	Working	Team: ILC_ILD_Team		Buesser_Karsten	25.06.2010 13:19:07	English	False
⊟ Has Design									
☐ ⊞ D00000000872433,A,1,3	ILD Placeholder Model		Working	Team: ILD_CAD_Integration_Team	Assembly	Welle_Norbert	02.07.2010 13:48:34		False
☐ ⊞ D00000000985823,A,1,1	ILD detector simulation model	ILD detector as implemented in the Mokka simulation	Working	Team: ILD_Physics-and-Optimization_Team	Assembly	List_Benno	08.04.2011 09:50:10		False
☐ ⊞ D00000000989043,A,1,1	ILD Model	STEP import from ILD_SM4_05-04-11.stp; Author: Matthieu Jore, LAL	Working	Team: ILD_CAD_Integration_Team	Assembly	Welle_Norbert	12.04.2011 16:25:54		False
⊞ Has Fabrication Part									
⊞ Is Realized As									
⊞ Is used by Generic Part									
⊞ Uses Generic Parts									

Important Documents: Parameter Tables

- ILD0dimensions-weigth130209:
  D00000000913605



- Definition of the ILD reference detector:
  D00000000913635

Definition of the ILD reference detector

ILD Joint steering board, September 21, 2008
(updated version: November 13, 2008 F. Gaede)

1. Introduction

In the following document the ILD detector is defined, as discussed on the second ILD meeting in Cambridge, UK, September 2008. The detector defined is the so-called reference detector for ILD, which has the following implications:

- The overall dimensions and main features of the detector are defines as a basis for the further evolution of ILD. They will be used for the LOI in 2009.
- The details of the detector are defined primarily for the purpose of performance studies. This detector will be implemented in the ILD simulation software (MOKKA and Jupiter) and will be used for future performance studies. This detector will be used for any large scale Monte Carlo production from now on.
- As much as possible the choice of parameters is based on studies which were presented at Cambridge. However in many cases studies have either not yet been finished, or are still inconclusive. Decisions taken in these cases are driven by the desire to define one detector. They may change later, once more information is available, or better reconstruction and/or analysis techniques have been developed.
- Wherever possible we have tried to define a virtual detector, which will deliver a certain performance, but which does not define a specific technology. In some In general this does not mean that ILD has chosen this technology typically the technology chosen is the currently most mature technology. This however does not imply any pre-decision on an eventual technology choice for the ILD group.
- In some cases we distinguish between a baseline detector, and possible upgrade or extension options. This refers to additional detector elements, which may or may not be included, depending primarily on the wanted performance, and possible optimization results.
- In many cases we have not yet chosen a specific technology, but follow more than one solution. These solutions currently are all considered with equal weight, and achieving more R&D results on all of them is considered of highest priority. During the process leading up to the LOI we will continue to evaluate this, and decide how many different options we will describe in the LOI.

2. Basic Parameters

The following table shows the main parameters of ILD_1:

Coil				
Rmin	3440		(Mokka: coil and cryostat modeled as one Al tube with 750 thickness)	
Rmax	4190			
Z	3872			

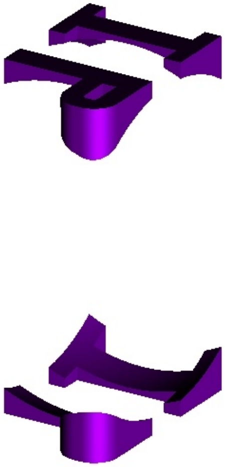
- Both taken from ILD Wiki pages
- If I had a Wiki password,
  I would have put links to EDMS into Wiki

Use of Parameter Tables

- Tables of Parameters (in particular, dimensions) should be provided together with the models, not reverese-engineered from them
- Parameter tables are an important tool to synchronize Engineering and Simulation models
  - Needs a list of parameters with precise definition:
    Is the „TPC outer radius“ the radius of the field cage, or with screw heads, or with cables and services?
  - Simulation group works on automated procedure to calculualte defined geometry parameters within Mokka and store it in XML output files (GEAR files)
    → we can have complete geometry parameter tables for each new Mokka model
  - Simulation people also think about providing additional values, such as material budget in radiation lengths → very useful for optimization.

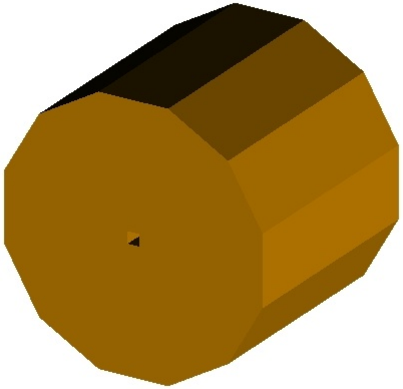
CAD Model Integration in EDMS

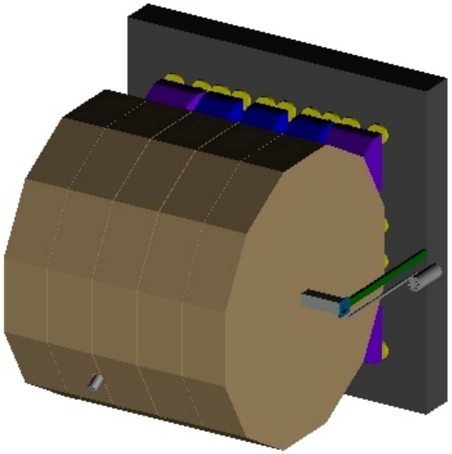
- DESY-IPP offers to check in all STEP files into EDMS
→ just send them to me by email (in zipped or rar'ed form)
- Some useful conventions that help integration
    - Coordinate system: There is an official ILD coordinate system, with z along the mean beam direction, y axis up
    - All assemblies should have the IP as reference point
(some CAD systems have problems with shifted origin)
→ See D00000001777642 for an example
    - CAD models should have a reasonable hierarchy
    - WBS nodes (= subdetectors) should appear in this hierarchy, e.g. ECAL Barrel, TPC, SIT, ...

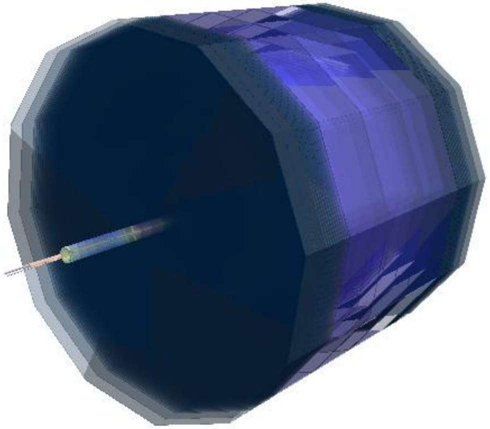


Available CAD Models for ILD in EDMS

- D00000000872433: Placeholder model: Still a very preliminary version
- D00000000989043: Engineering model from Matthieu
  → will be updated
- D00000000952125: Mokka simulation model ILD_01_pre01
  → the plan is to update this model, as new Mokka pre-releases become available
  → Also available as 3D-PDF (but veeeeeeeery slow, because of too much detail in SIT/SET/ETD subdetectors)
- It is possible that you cannot access (some) of the models, until they have been released



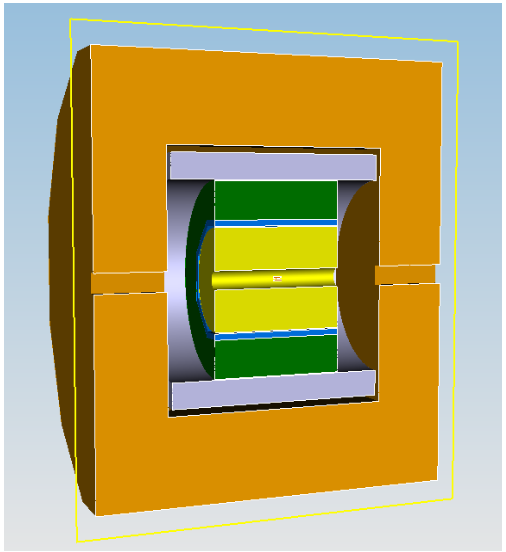




Different Points of View

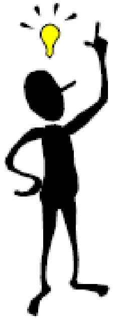
Top-Level Management

The inner radius of the ECAL is 250cm



We need a support structure for the ECAL

I need 25 layers of 2cm tungsten in the ECAL

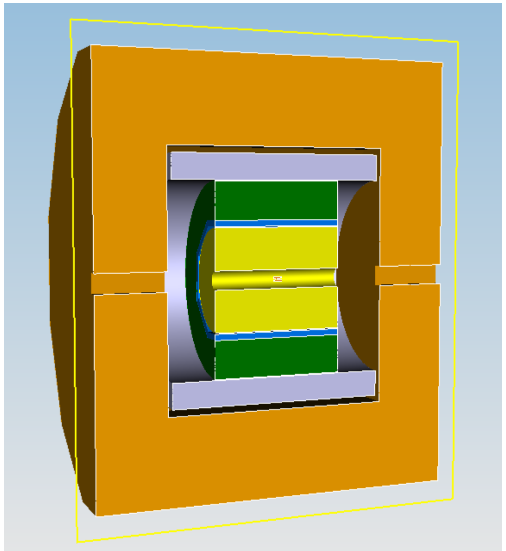


Scientist

Engineer

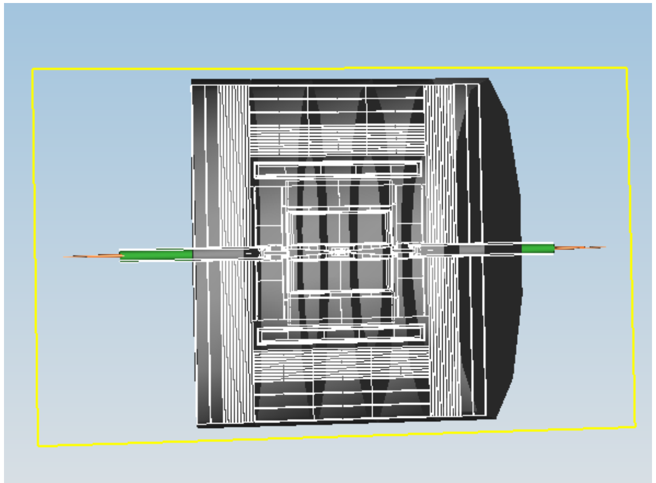
Different Models

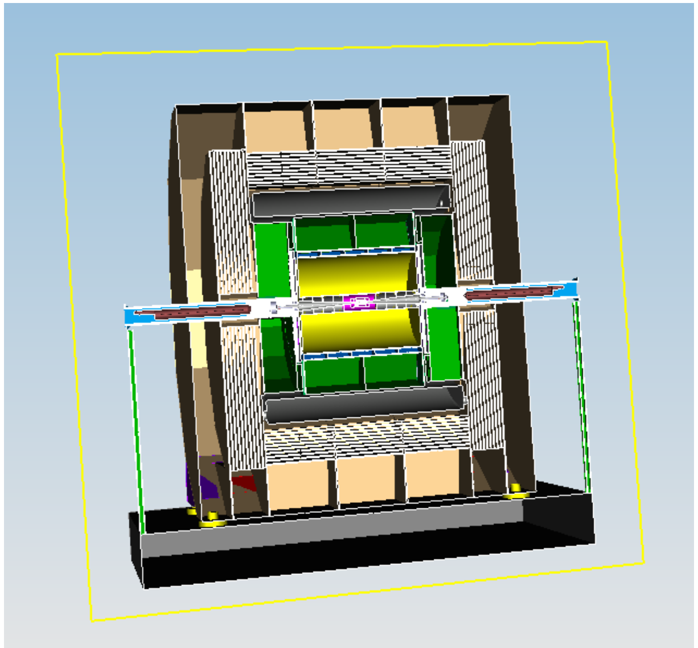
Placeholder Model for System Layout



(Detailed)
Engineering Model(s)
→ Separate Subdetectors

Physics Simulation
Model (Mokka)

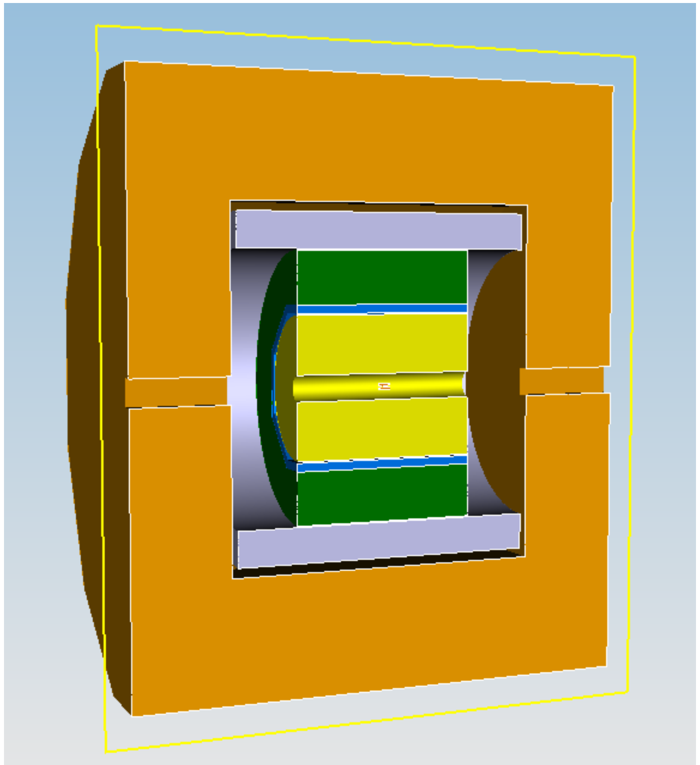




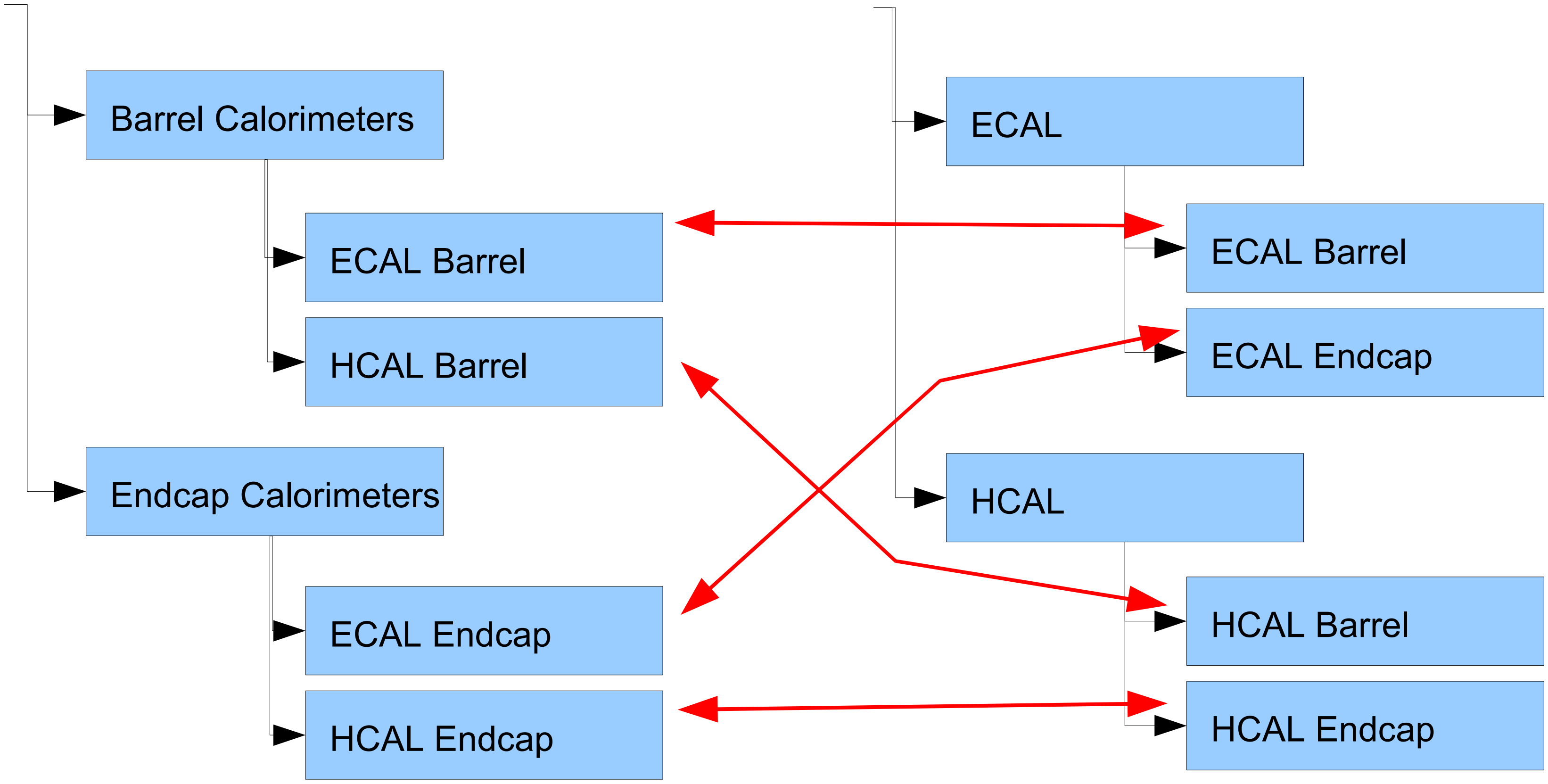
Placeholder Model

> Purpose:

- **Decouple** detailed engineering of subsystems
- **Define** overall layout and available space for components
- Separate volumes exclusively used by one subsystem from common areas for cabling, cooling, support



Hierarchies



Assembly oriented

Design oriented

Important: All models should have corrsponding leaf nodes at some levels

Some Remarks about the famous WBS

- WBS: **Work** Breakdown Structure
- **Structures** which **Work** has to be done,
  and structures the output of the work:
  - CAD models of subsystems
  - Parameter tables
  - Requirements
  - Performance evaluation
- WBS does not care which parts are physically (dis)connected or in which sequence they are assembled, but how they are conceptually related.
  - Example: Physically, ECAL Endcap and HCAL endcap are mounted together, but conceptually ECAL endcap and barrel may be closer related
- WBS is also not structured according to which-institute-does-what
- But it is structured according to responsibilities:
  Somebody should be (or at least feel) responsible for each WBS node

Example: WBS for a Computer

- Case
  - Case 1: Large case
  - Case 2: Small case
- Motherboard
- CPU
  - CPU 1: Dual core, 3.1GHz
  - CPU 2: Quad core, 3.3 GHz
- Hard Disk
  - 500 GB HD, 5200 rpm
  - 1 TB SCSI, 7200 rpm
  - 256 GB SSD
- **Integration**
  - Model 1: Small Case + Motherboard + Dual core CPU + 256 SSD
  - Model 2: Large case + Motherboard + Quad core CPU + 1TB HD

CPU sits on motherboard, but in WBS hierarchy it is on the same level

Integration takes components from other WBS nodes and delivers a complete (integrated) product

WBS and Engineering / Simulation Model Hierarchy

- WBS is not **the** hierarchy for engineering model or simulation model
- But: At some level there should be common nodes:
  Every model (placeholder / engineering / simulation) should have
  - Barrel ECAL
  - TPC
  - SIT
  - Yoke
- Deliverables for Barrel ECAL:
  - Placeholder
  - Detailed engineering model
  - Simulation code (Mokka driver plus steering parameters)
  - Overall description (human-readable)
  - Excel sheets with parameters (outer dimension, weight, radiation length, power consumption)
- Engineering integration takes engineering model and integrates it into complete detector model
- Mokka integration group takes driver and steering and integrates it into Mokka model ILD_01

Topics for Discussion

- To which detail level should an integrated CAD model be done?

  Experience from HERA-B, FLASH:
  A complete, detailed CAD model of a full detector does not work.

  Advice, tested by XFEL:
  Stop detailed intergration at subdetector level,
  define placeholder model,
  integrate models using JT files for „pretty pictures“

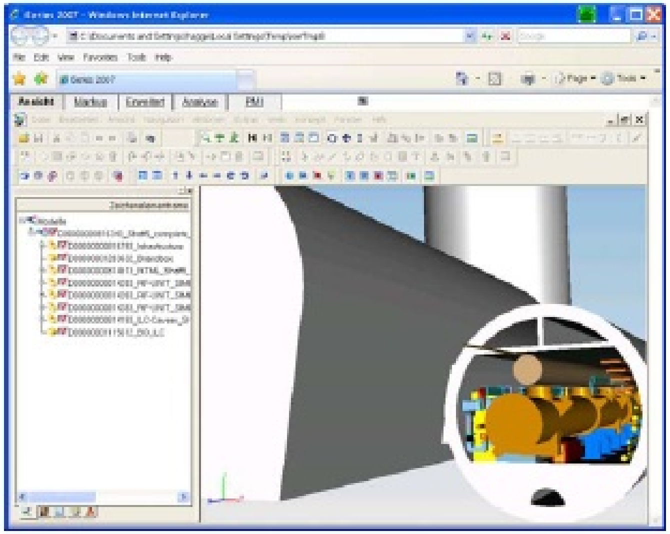
  For which purpose would one need a fully detailed model of the whole detector?

- How should a process look like that ensures good coherence between engineering and simulation models?

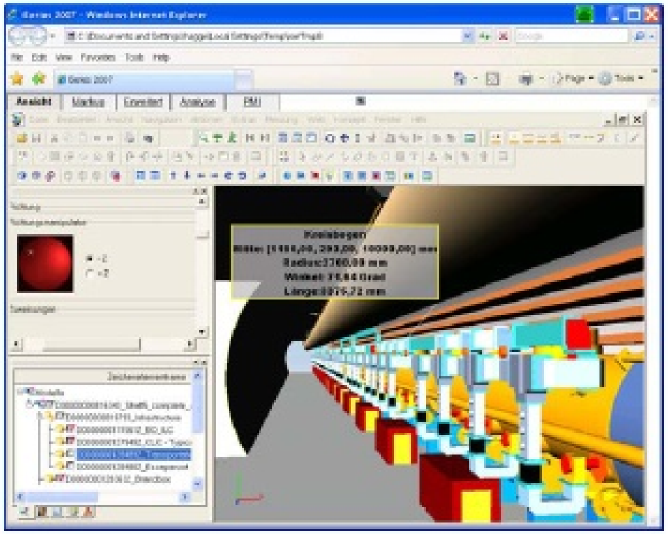
Backup

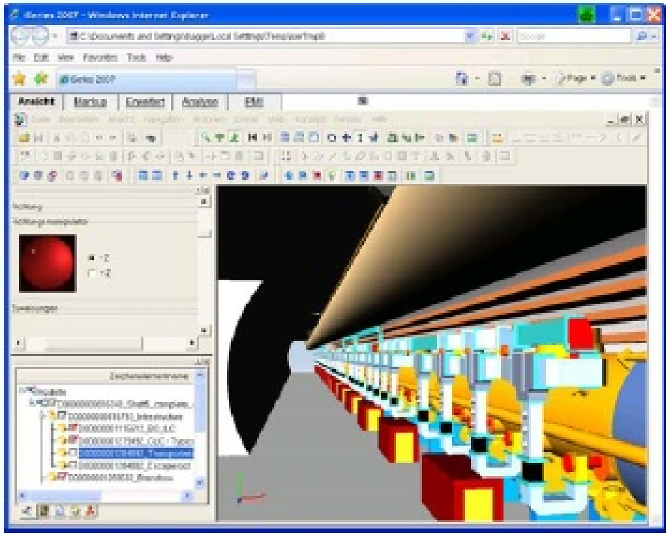
DEMO: ILC Reference Tunnel in EDMS, *0816343

Explore

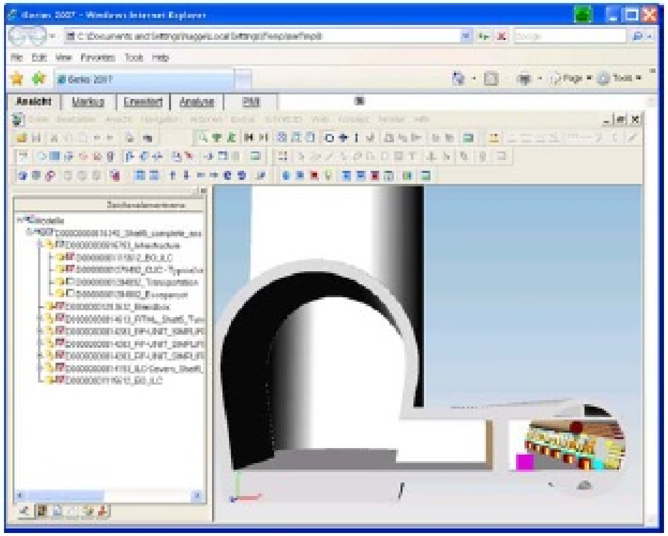


Measure





Walk-Thru



Section

Lars Hagge, D*1583791

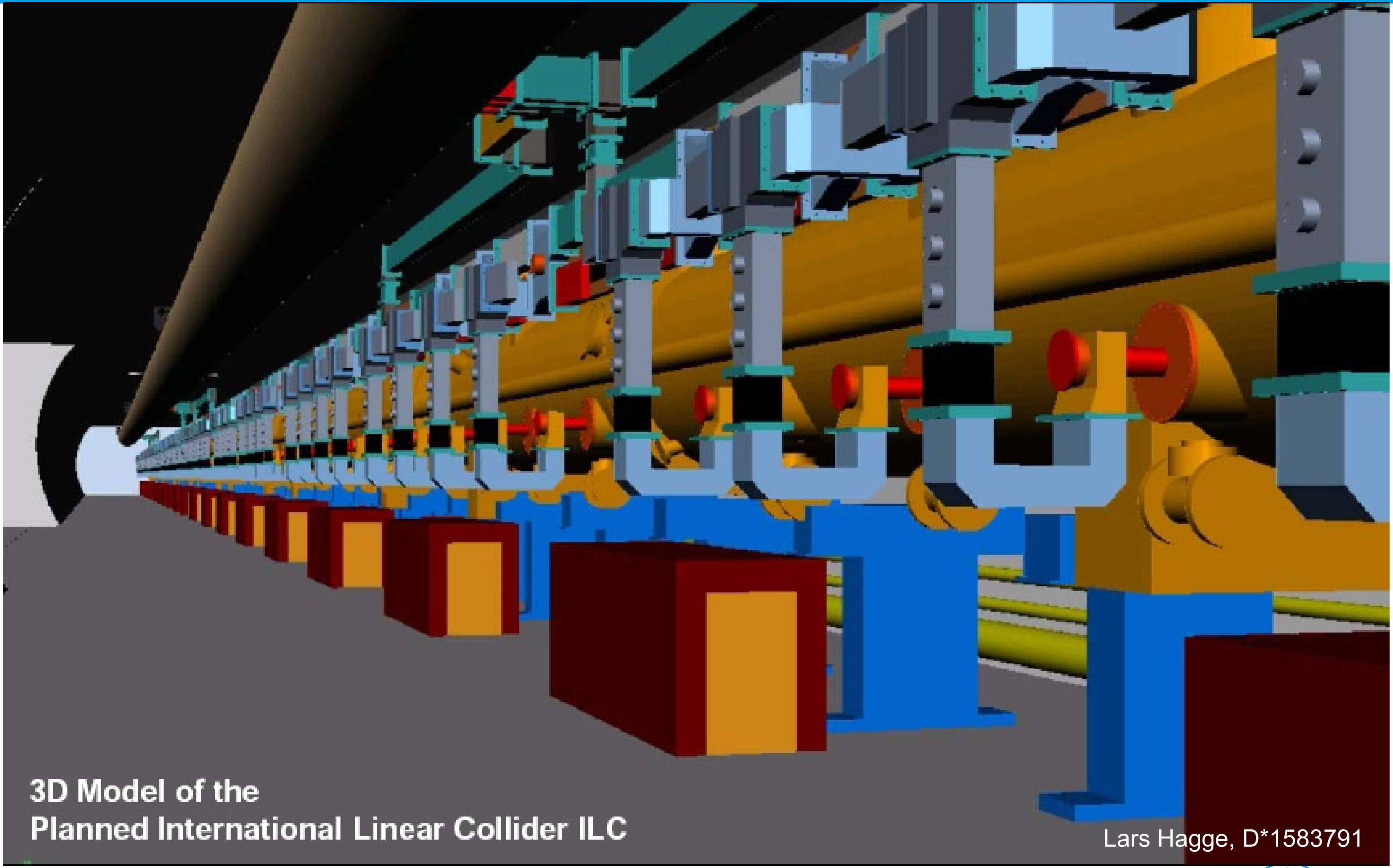
How was the Model Built?

> Contributions to ILC 3D model

Civil underground engineering	John Osborne, CERN
Ring to main linac, RTML	Norbert Collomb, STFC
Main linac, ML	Don Mitchell, FNAL
Tunnel infrastructure	(MW Zander: No result) → John Osborne, CERN
Master model assembly & fixing	Norbert Welle, DESY

> Process according to experience from European XFEL, cf.

- N Bergel, L Hagge, T Hott, J Kreutzkamp, S Sühl, N Welle
  Inter-Disciplinary Mechanical and Architectural 3D CAD Design Process at the European XFEL
  EPAC 2008, Genova
- N Bergel, L Hagge, A Herz, J Kreutzkamp, S Sühl, N Welle
  3D CAD Collaboration at European XFEL and ILC
  PAC 2009, Vancouver



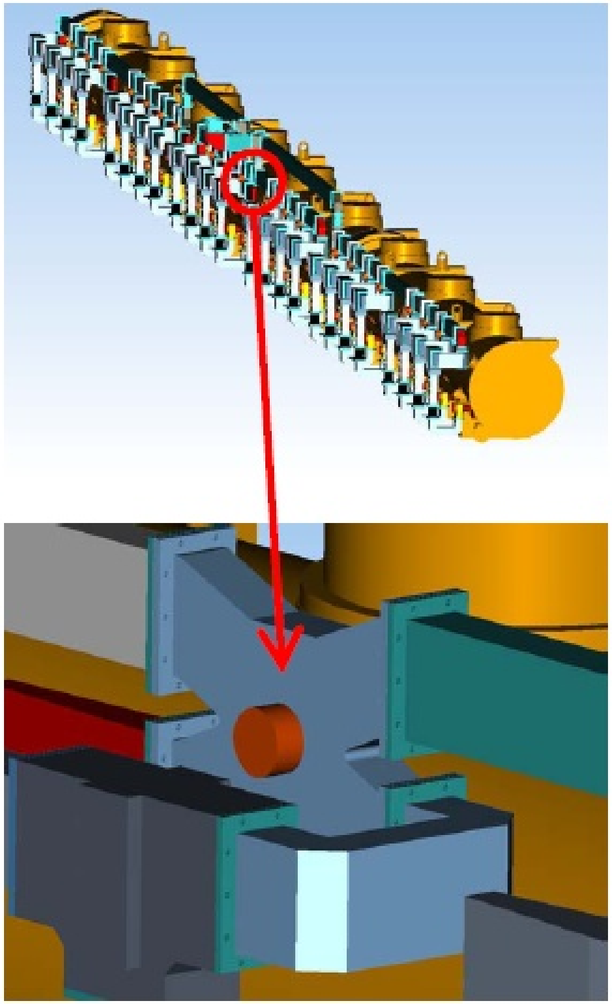
3D Model of the
Planned International Linear Collider ILC

Lars Hagge, D*1583791

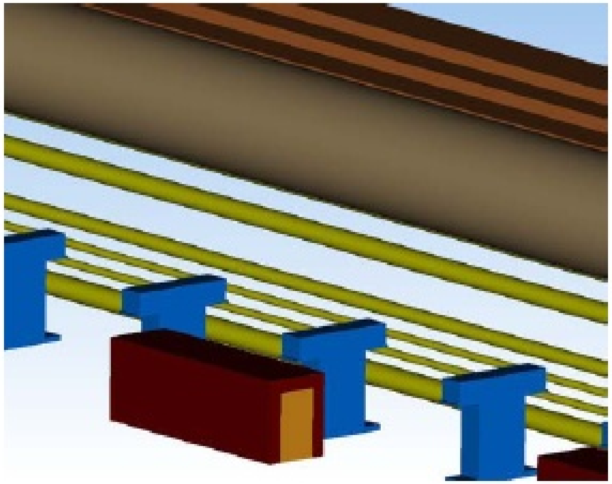
Issues: Complexity of Models (Adequate Level of Detail)

> Performance: Complexity of model adapted to objective

- Facility planning – needs placeholders for space allocation, entire facility
- Visualization – needs "sufficient" details for good "impression", no inner geometry
- Technical design – detailed design, individual components only



detailed model in facility planning
less detail would not reduce model usability, but could improve model performance

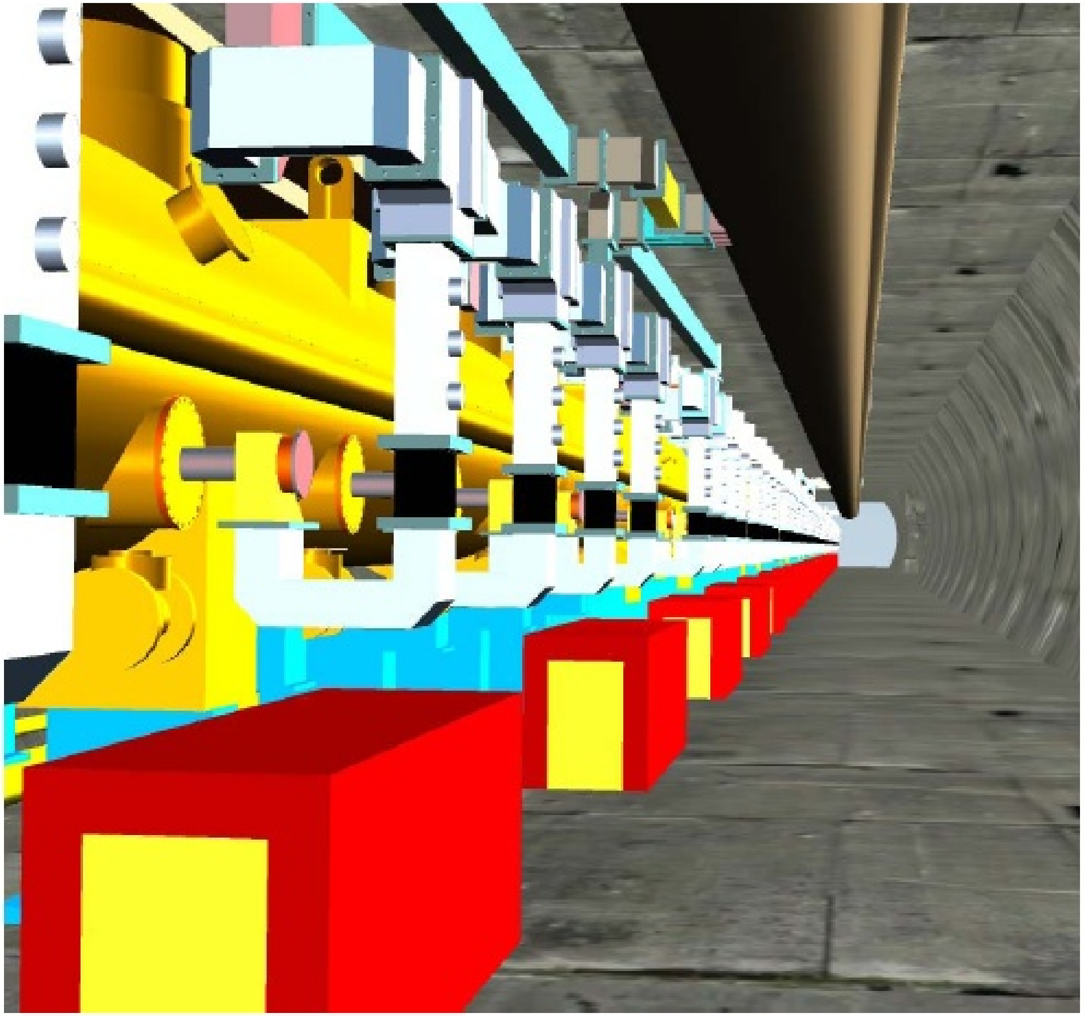


sufficient level of detail for facility planning & visualization

Consequences

- **Define** coordinate system (origin and orientation)
  - origin at interaction point (IP), z-axis in e^--Beam direction, y upwards, right-handed
- **Define** set of reference points
  - on set of reference points referring to shafts and tunnel segments: Be able to "tie" elements to buildings – e.g. place racks and installations in tunnels
  - on set of reference points referring lattice elements: Be able to "tie" elements to beam positions – e.g. place models and magnets in beam
  - both sets are "connected" at IP
- **Enforce** every model to contain one reference point
- **Define**, agree upon and **publish** design guidelines

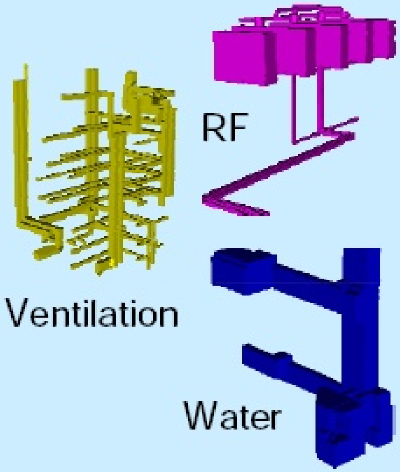
Exploring the ILC in Virtual Reality

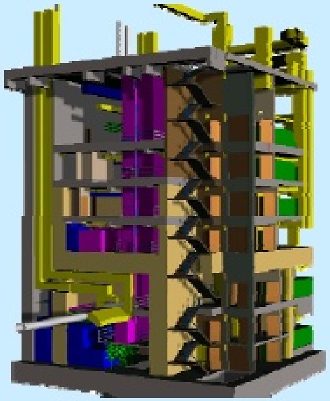


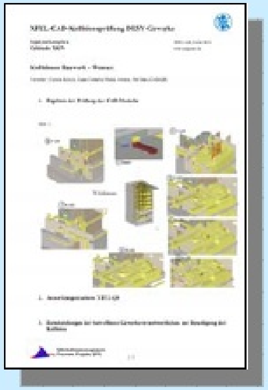
- Use VR to "experience" the planned facility
  - improved perception of space, e.g. reachability, room for movements and transport
- Preparing models for VR presentation
  - add light sources
  - add textures
  - add material properties, e.g. color, transparency, reflection
  - suppress "invisible" elements, e.g. space for transportation and installation activities, emergency escape routes, unnecessary details, inner geometries

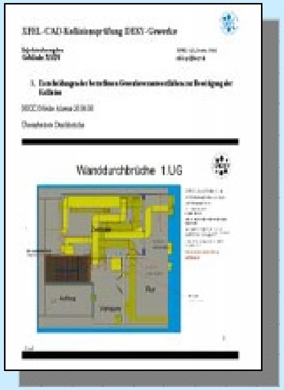
Sub-System Designers	3D CAD QA Team	3D CAD QA Team	Sub-System Coordinators
create / update subsystem model	integrate & release building model	perform QA: collision checks …	agree on resolution strategy

iterate from here every two weeks







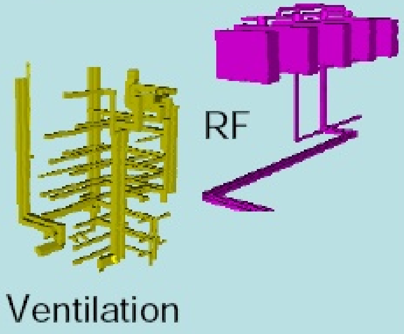


Nils Bergel, D*1369001

The XFEL Design & Integration Process

Sub-System Designers

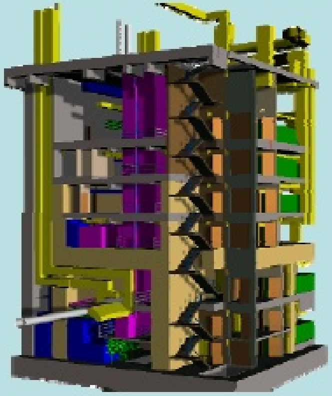
create / update subsystem model →



3D CAD QA Team

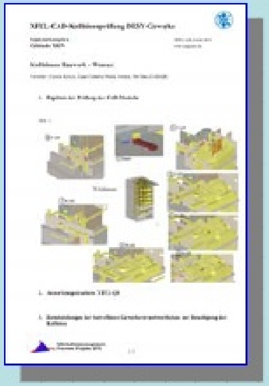
iterate from here every two weeks

integrate & release building model →



3D CAD QA Team

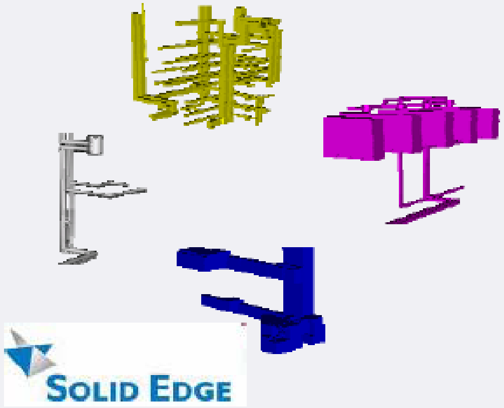
perform QA: collision checks … →



Sub-System Coordinators

agree on resolution strategy → create / update subsystem model

2 Weeks in the Design & Integration Process

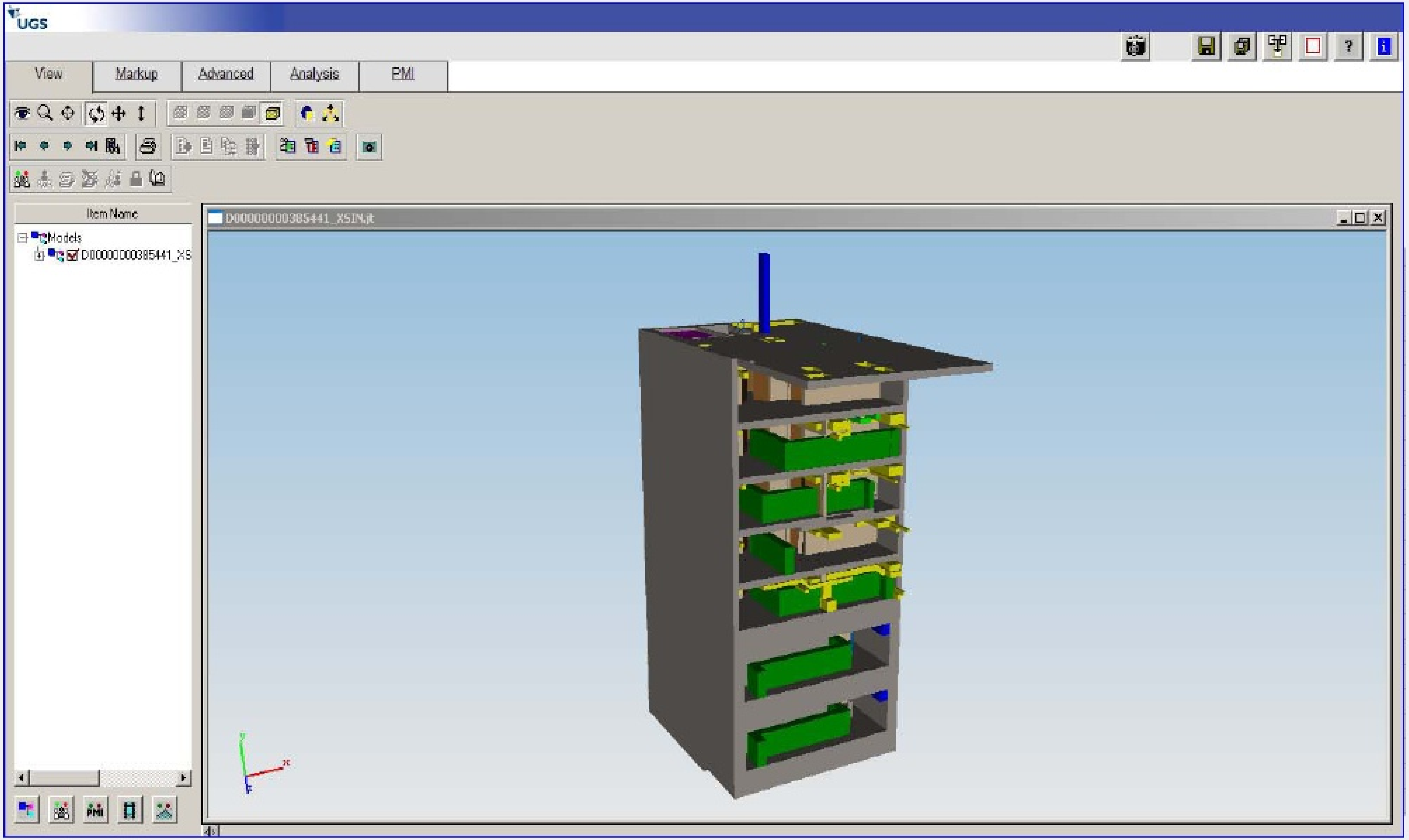


sub-system model delivered

3D CAD QA Team

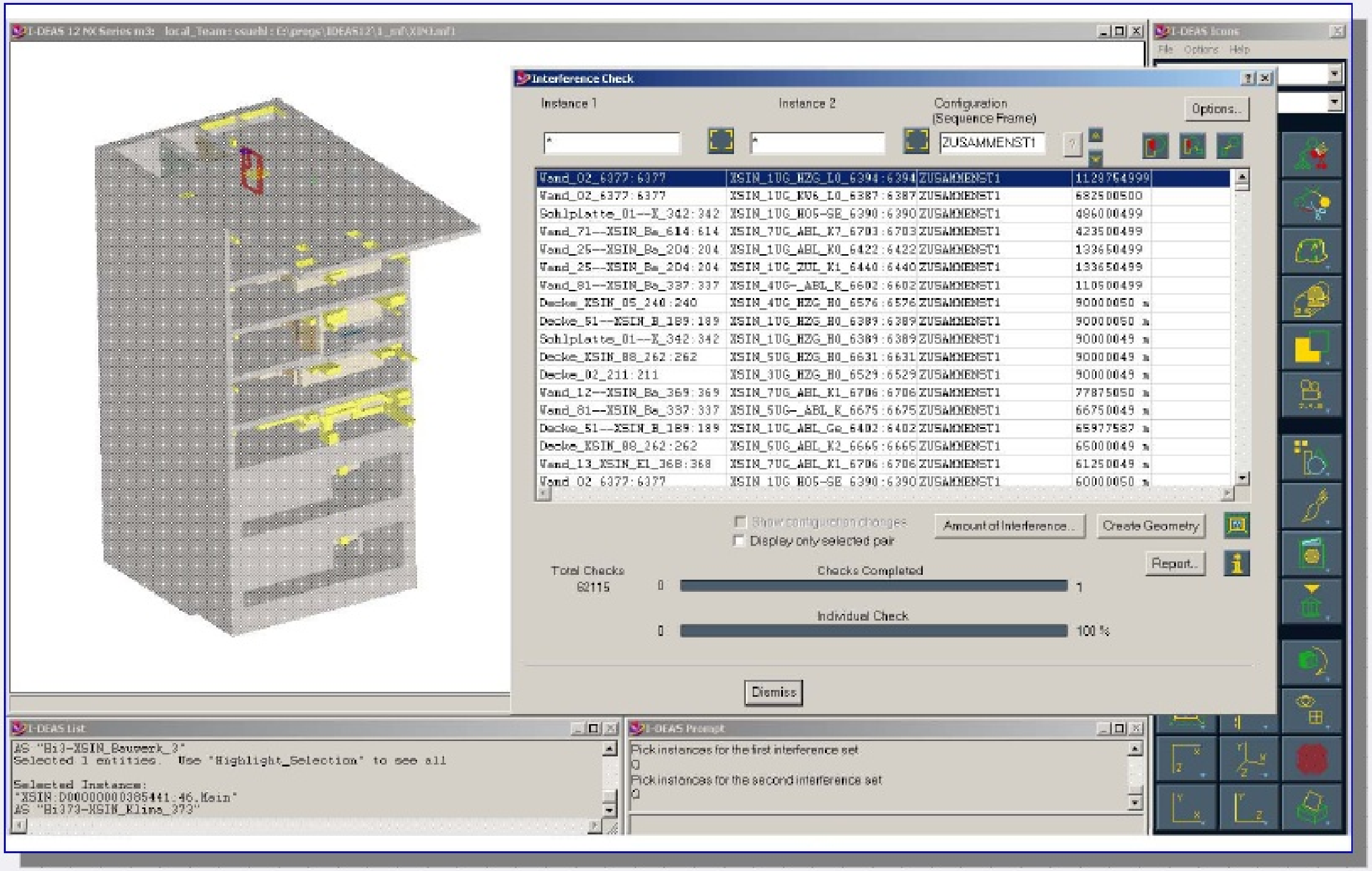
3D CAD QA team checks model for defects, positions and nomenclature.
After successful checks, the entire model is updated and released.

2 Weeks in the Design & Integration Process



2 Weeks in the Design & Integration Process

- Day 2-5: 3D CAD QA Team performs collision checks



Instance 1: *

Instance 2: *

Configuration (Sequence Frame): ZUSAMMENST1

Wand_02_6377:6377	XSIN_1UG_HZG_L0_6394:6394	ZUSAMMENST1	1129754999
Wand_02_6377:6377	XSIN_1UG_KV6_L0_6387:6387	ZUSAMMENST1	682500500
Sohlplatte_01--X_342:342	XSIN_1UG_HOS-GE_6390:6390	ZUSAMMENST1	496000499
Wand_71--XSIN_Ba_614:614	XSIN_7UG_ABL_K7_6703:6703	ZUSAMMENST1	423500499
Wand_25--XSIN_Ba_204:204	XSIN_1UG_ABL_K0_6422:6422	ZUSAMMENST1	133650499
Wand_25--XSIN_Ba_204:204	XSIN_1UG_ZUL_K1_6440:6440	ZUSAMMENST1	133650499
Wand_81--XSIN_Ba_337:337	XSIN_4UG-_ABL_K_6602:6602	ZUSAMMENST1	110500499
Decke_XSIN_05_240:240	XSIN_4UG_HZG_H0_6576:6576	ZUSAMMENST1	90000050
Decke_51--XSIN_B_189:189	XSIN_1UG_HZG_H0_6389:6389	ZUSAMMENST1	90000050
Sohlplatte_01--X_342:342	XSIN_1UG_HZG_H0_6389:6389	ZUSAMMENST1	90000049
Decke_XSIN_08_262:262	XSIN_5UG_HZG_H0_6631:6631	ZUSAMMENST1	90000049
Decke_02_211:211	XSIN_3UG_HZG_H0_6529:6529	ZUSAMMENST1	90000049
Wand_12--XSIN_Ba_369:369	XSIN_7UG_ABL_K1_6706:6706	ZUSAMMENST1	77875050
Wand_81--XSIN_Ba_337:337	XSIN_5UG-_ABL_K_6675:6675	ZUSAMMENST1	66750049
Decke_51--XSIN_B_189:189	XSIN_1UG_ABL_Ge_6402:6402	ZUSAMMENST1	65977587
Decke_XSIN_08_262:262	XSIN_6UG_ABL_K2_6665:6665	ZUSAMMENST1	65000049
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Wand_02_6377:6377	XSIN_1UG_HOS-GE_6390:6390	ZUSAMMENST1	60000050

☐ Show configuration changes
☐ Display only selected pair

Total Checks 62115

Checks Completed 0 1

Individual Check 0 100 %

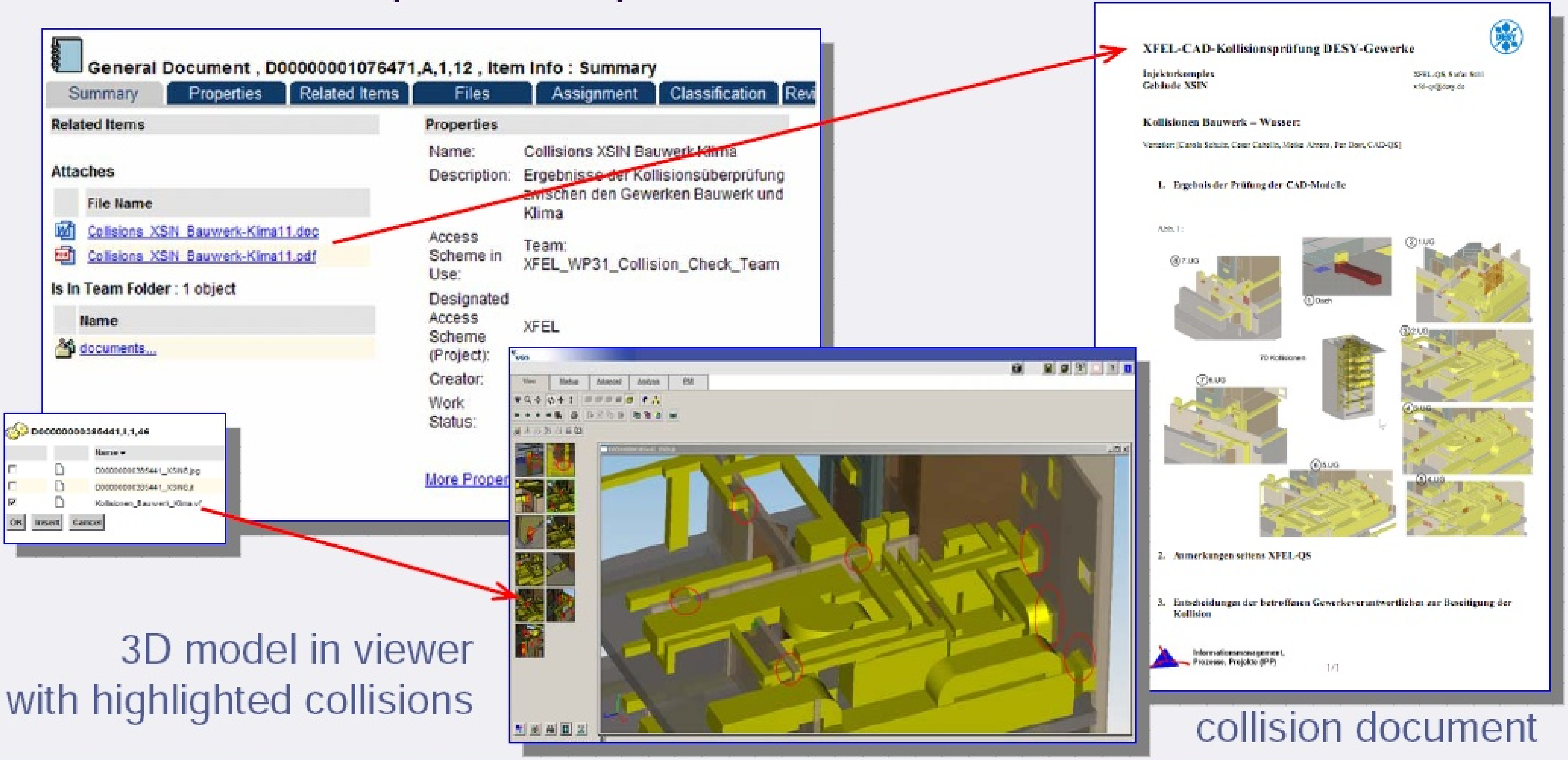
```
AS "Hi3-XSIN_Bauwerk_3"
Selected 1 entities.  Use 'Highlight_Selection' to see all

Selected Instance:
"XSIN:D000000000385441:46,Main"
AS "Hi373-XSIN_Klima_373"
```

```
Pick instances for the first interference set
Q
Pick instances for the second interference set
Q
```

2 Weeks in the Design & Integration Process

- Day 2-5: 3D CAD QA Team documents collisions and informs responsible persons from affected trades



General Document , D00000001076471,A,1,12 , Item Info : Summary

Related Items

Attaches

File Name
Collisions_XSIN_Bauwerk-Klima11.doc
Collisions_XSIN_Bauwerk-Klima11.pdf

Is In Team Folder : 1 object

Name
documents...

Properties

Name: Collisions XSIN Bauwerk-Klima

Description: Ergebnisse der Kollisionsüberprüfung zwischen den Gewerken Bauwerk und Klima

Access Scheme in Use: Team: XFEL_WP31_Collision_Check_Team

Designated Access Scheme (Project): XFEL

Creator:

Work Status:

More Proper

XFEL-CAD-Kollisionsprüfung DESY-Gewerke

Injektorkomplex
Gebäude XSIN

XFEL-QS Stefan Sühl
xfel-qs@desy.de

Kollisionen Bauwerk – Wasser:

Verteiler: [Carola Schulz, Cesar Cabello, Maike Ahrens, Per Dorn, CAD-QS]

1. **Ergebnis der Prüfung der CAD-Modelle**

Abb. 1:

2. **Anmerkungen seitens XFEL-QS**

3. **Entscheidungen der betroffenen Gewerkeverantwortlichen zur Beseitigung der Kollision**

Informationsmanagement, Prozesse, Projekte (IPP)

1/1

3D model in viewer
with highlighted collisions

collision document

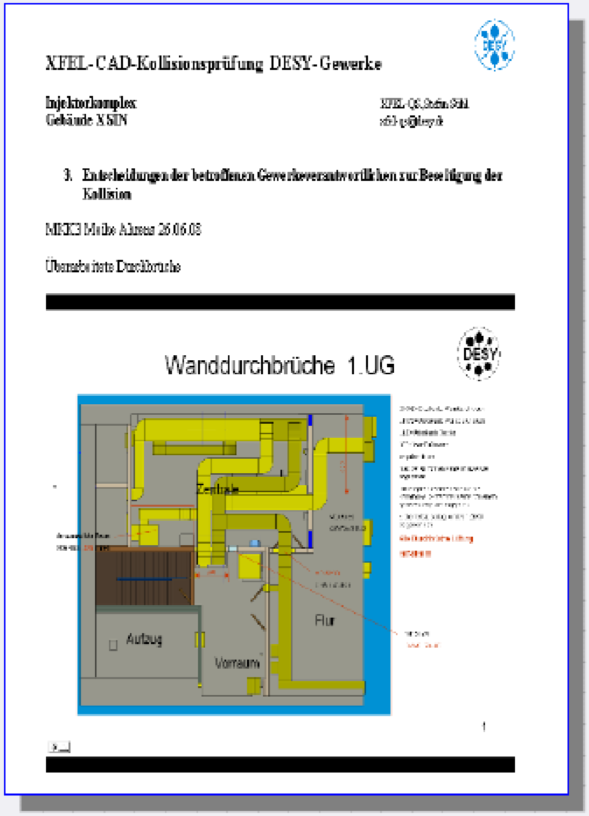
2 Weeks in the Design & Integration Process

- Day 2-10: Trades reach agreement on changes

Engineers from sub-systems describe and sign-off change decisions and route them to their design engineers. Designers change design models in their authoring 3D CAD system.

D0000000010764 71,A,1,12: Unterzeichnungs-Historie

Benutzerkennung	Zuweisung	Unterschrieben von	Ausgeführte Aktion	Name des Lebenszyklus	Unterschriftsdatum	Kommentare
Schulz_Carola	Zur Prüfung		Keine	LCIII Empty Routing List,A,1		
Ahrens_Meike	Submitter Signature			LCIII Empty Routing List,A,1		
Cabello_Cesar	bitte um Ergänzung/Bearbeitung	Cabello_Cesar	Keine	LCIII Empty Routing List,A,1	05/30/2008 07:58:46:672	dein Abschnitt! Gruß Cesar
Dost_Per_IG	bitte um Ergänzung/Bearbeitung	Dost_Per_IG	OK	LCIII Empty Routing List,A,1	05/29/2008 13:06:33:359	
Schulz_Carola	bitte um Ergänzung/Bearbeitung		Keine	LCIII Empty Routing List,A,1		
Stoye_Thorsten	bitte um Ergänzung/Bearbeitung	Stoye_Thorsten	OK	LCIII Empty Routing List,A,1	06/05/2008 09:44:25:889	
Suehl_Stefan	bitte um Ergänzung/Bearbeitung	Suehl_Stefan	OK - Siehe Kommentare	LCIII Empty Routing List,A,1	06/03/2008 12:03:13:669	Auf Seite 4+5 sind noch Unklarheiten => an Fr. Ahrens zurück
Ahrens_Meike	Zur Prüfung	Ahrens_Meike	OK	LCIII Empty Routing List,A,1	05/30/2008 08:01:44:900	
Ahrens_Meike	bitte um Ergänzung/Bearbeitung	Ahrens_Meike	OK	LCIII Empty Routing List,A,1	05/30/2008 08:01:44:434	
Suehl_Stefan	Submitter Signature	Suehl_Stefan		LCIII Empty Routing List,A,1	06/03/2008 15:40:08:387	
Ahrens_Meike	Zur Prüfung	Ahrens_Meike	OK	LCIII Empty Routing List,A,1	06/03/2008 15:40:07:384	
Ahrens_Meike	Submitter Signature	Ahrens_Meike		LCIII Empty Routing List,A,1	06/12/2008 09:48:52:677	
Schrader_Stefan	Durchbrüche überarbeitet	Schrader_Stefan	Nicht OK - Siehe Kommentare	LCIII Empty Routing List,A,1	06/12/2008 09:48:50:798	Nicht zuständig??
Suehl_Stefan	Durchbrüche überarbeitet	Suehl_Stefan	OK	LCIII Empty Routing List,A,1	06/03/2008 16:39:44:183	
Suehl_Stefan	Submitter Signature			LCIII Empty Routing List,A,1		
Ahrens_Meike	Zur Prüfung	Ahrens_Meike	OK	LCIII Empty Routing List,A,1	06/26/2008 10:51:30:274	
Cabello_Cesar	Zur Prüfung	Cabello_Cesar	OK - Siehe Kommentare	LCIII Empty Routing List,A,1	06/16/2008 08:47:36:814	Zuständig, Fr. Ahrens
Schulz_Carola	Zur Prüfung		Keine	LCIII Empty Routing List,A,1		
Suehl_Stefan	Submitter Signature			LCIII Empty Routing List,A,1		
Ahrens_Meike	Zur Prüfung	Ahrens_Meike	OK	LCIII Empty Routing List,A,1	06/26/2008 09:59:41:038	
Cabello_Cesar	Zur Prüfung		Keine	LCIII Empty Routing List,A,1		
Schulz_Carola	Zur Prüfung		Keine	LCIII Empty Routing List,A,1		
Ahrens_Meike	Submitter Signature			LCIII Empty Routing List,A,1		
Schulz_Carola	bitte um Korrektur... DANKE		Keine	LCIII Empty Routing List,A,1		
Suehl_Stefan	bitte um Korrektur... DANKE		Keine	LCIII Empty Routing List,A,1		
Ahrens_Meike	Submitter Signature	Ahrens_Meike		LCIII Empty Routing List,A,1	06/27/2008 11:04:16:639	
Dost_Per_IG	Bitte um Genehmigung...Danke	Dost_Per_IG	OK	LCIII Empty Routing List,A,1	06/27/2008 11:04:13:558	
Ahrens_Meike	Submitter Signature			LCIII Empty Routing List,A,1		
Dost_Per_IG	durchbruch ergänzt	Dost_Per_IG	OK	LCIII Empty Routing List,A,1	06/30/2008 16:03:47:566	
Suehl_Stefan	durchbruch ergänzt		Keine	LCIII Empty Routing List,A,1		



XFEL-CAD-Kollisionsprüfung DESY-Gewerke

Injektorkomplex
Gebäude XSIN

XFEL-QS, Stefan Sühl
xfel-qs@desy.de

3. Entscheidungen der betroffenen Gewerkeverantwortlichen zur Beseitigung der Kollision

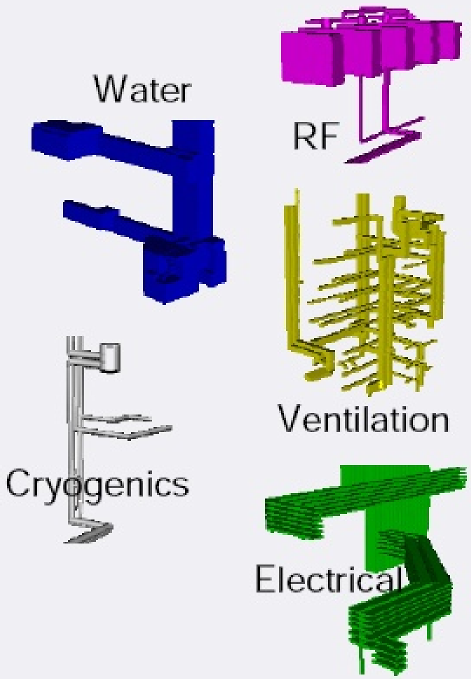
MKK3 Meike Ahrens 26.06.08

Überarbeitete Durchbrüche

Wanddurchbrüche 1.UG

2 Weeks in the Design & Integration Process

- Day 10: Trades deliver changed placeholder models to the 3D CAD QA Team



3D CAD QA team checks model for defects, positions and nomenclature.

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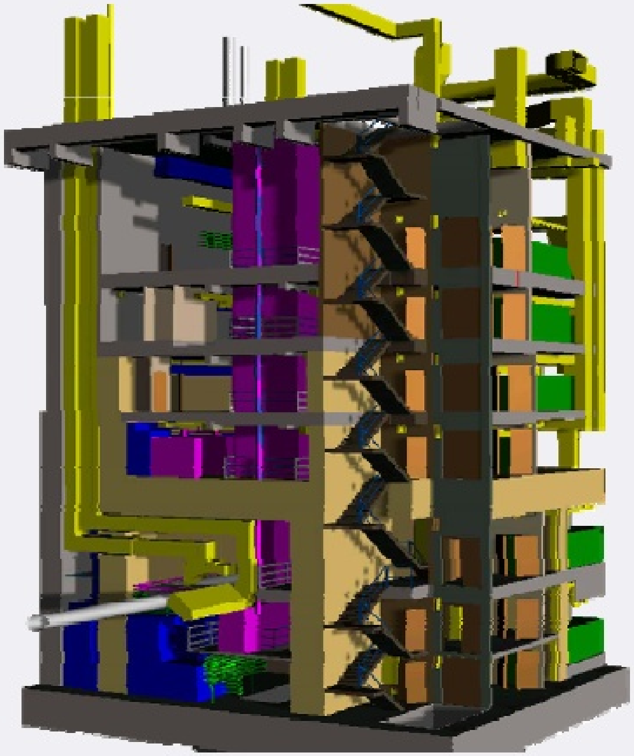

Demonstration