

EDMS-based Change Management Support

Lars Hagge

Joint ILC/XFEL Meeting
DESY, Hamburg, 24.08.2007

Agenda

- Change Management
- Requirements at ILC and XFEL
- EDMS Capabilities
- Conclusion

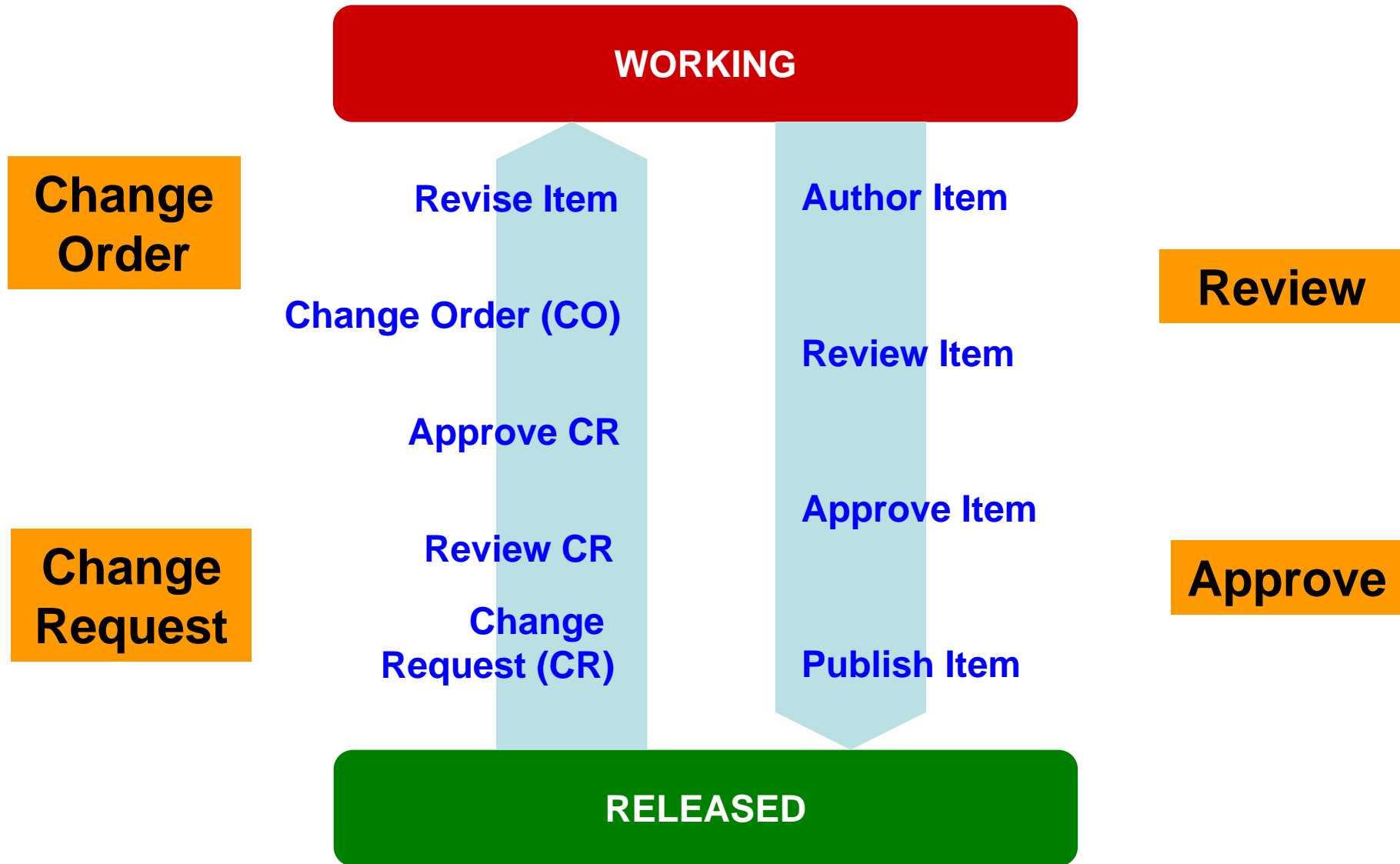
Agenda

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Change Management

- aims to eliminate discrepancies between product requirements and delivered product
- addresses an organization's ability to accommodate changes to and maintain the integrity of its requirements and associated product information
- is based on the premise that change runs a company and that change itself must be managed
- enables an organization to escape a mode of corrective action and instead enter a mode of continuous improvement
- implies building products according to released documents, by creating, changing, and approving the documents before performing the work

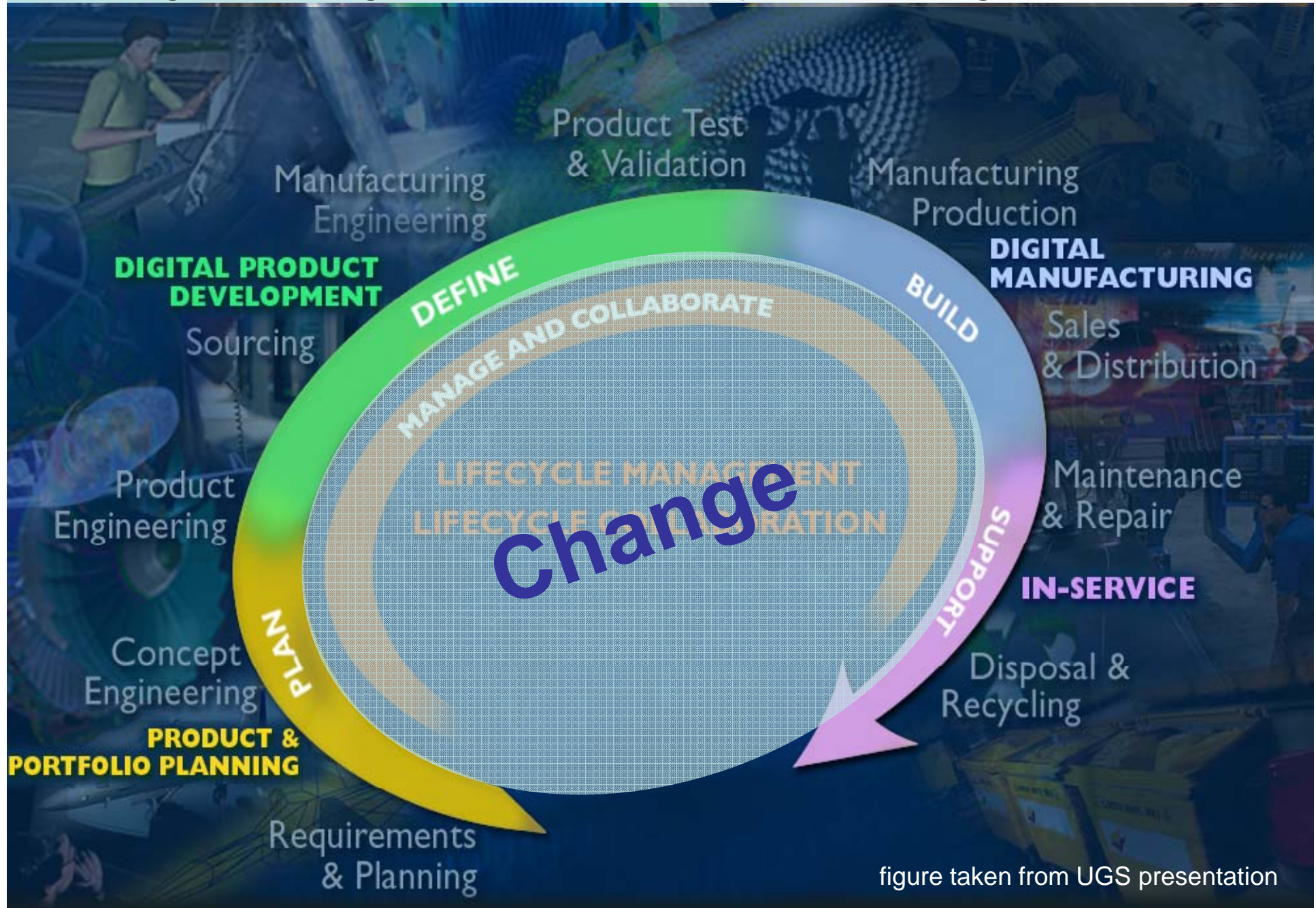
Change Management (Or: Document Lifecycle)



Change Management

- is requested for specific purposes, e.g.
 - to formalize documentation and channel communication in distributed organizations
 - to maintain cost control (esp. at the transition from engineering to fabrication)
 - to coordinate multiple sub-contractors
- has impacts and side effects
 - change execution requires resources → project plan
 - synchronize multiple changes → date of effectivity
 - other dependant approved items → (in-) validating items
 - roles and responsibilities → assign persons to roles

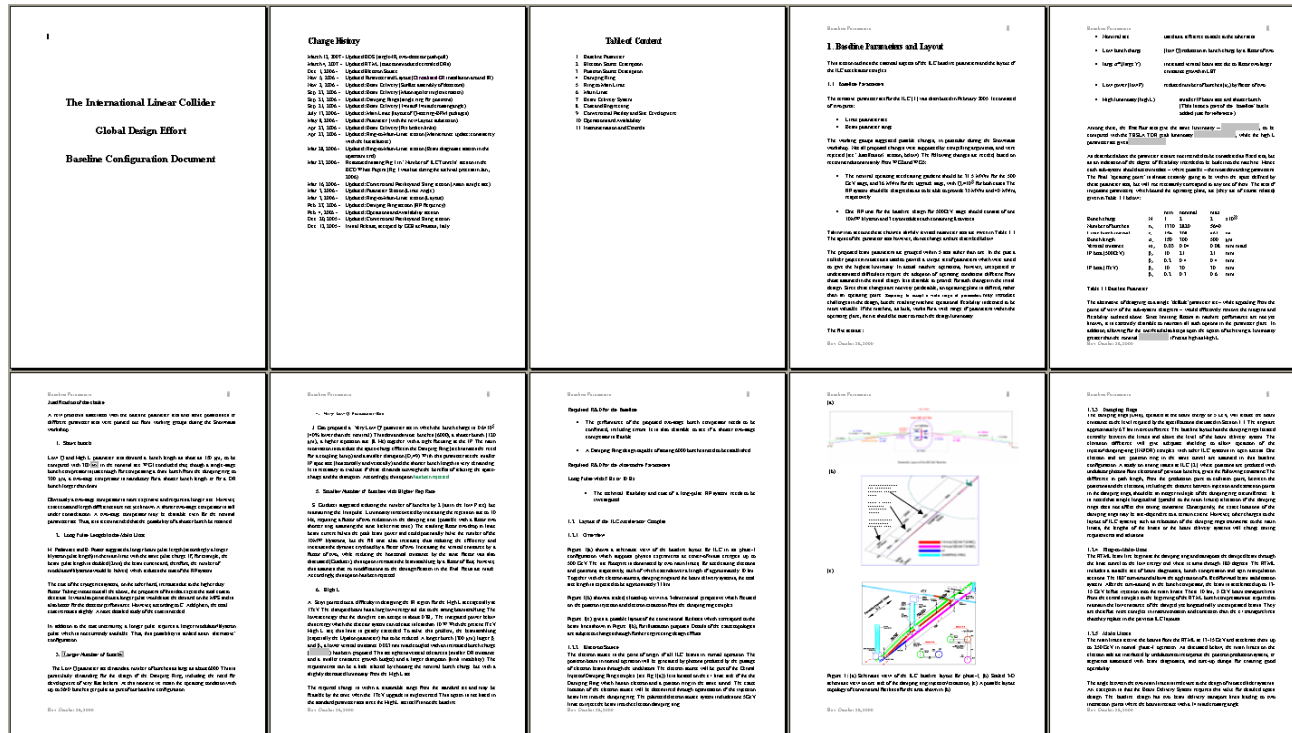
(Change Management \subset) Lifecycle Management



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Change Management Requirements at ILC



- provide change control for baseline configuration document
- started as one document to be controlled – now turns out to be much more

ILC Change Control Procedure

v.0.6 April 14, 2008

To: To Whome'r My Concern
 From: GDE CCB
 Subject: Procedure for BC Changes (updated April 1, 2008)

1. Introduction

- This document defines the procedure for GDE to follow (Change Procedure) when content of the Baseline Configuration (BC) need to be revised, corrected, updated or reorganized.
- Each of the Change Procedures consists of (1) a Change Request, (2) a review, and (3) an approval or rejection.
- A Change Request has to be submitted to the Change Control Board. Members of the GDE Executive Committee, leaders of the Area System Groups, leaders of the Global Groups, chairs of the GDE Board, Design&Cost Board, R&D Board and Change Control Board, and RDE Integration Team may submit a Change Request.
- Suggestions for BC changes, or issues with BC, may be sent to CCB by any GDE and non-GDE members who do not belong to the category above. CCB will forward such communications to the relevant parties for their consideration for formal submission of Change Request.
- Classifications of Change Requests and the class-specific change procedures are described below.

2. Classification

- Each Change Request will be classified as one of those listed in the table below:

Class	Category	Contents	Cost implications
0	Minor replacement of an existing BC description, or simple insertion of a new (or missing) system subsection.	<ul style="list-style-type: none"> Corrections for simple errors; or Improvement of text, tables or figures, without any substantial changes in terms of scientific content; or Improvement of the completeness of BC without any substantial changes in terms of assessed situations of BC content. 	None
1	Significant replacement of, or addition to, an existing BC content.	Improved performance or reduced cost, with relatively minor impacts on other ILC systems.	Below -100k€
2	Major replacement of, or addition to, an existing BC content.	Improved performance or reduced cost with large	Above 100k€

CCB Proc'0.6

	impacts on other ILC systems, or with significant changes in performance, schedule or risk.
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3. Submission of a Change Request

- CCB accepts Change Requests only electronically at ccb-req@kodiak.llnwd.net.
- A Change Request is expected to contain the following:
 - Requester's contact information;
 - Concise summary of the Change Request;
 - Replacement text for the relevant part of BC description;
 - Classification in requester's view;
 - Reasonably detailed descriptions and reasons for the Change Request;
 - Assessment of the impacts of the change in requester's view;
 - Supporting materials if any.
- Note: There are cases in which CCB submits a Change Request on its own. The procedure to follow, technically, is the same.

4. Preliminary Communication and Handling concerning a Change Request

- Upon receipt of a Change Request, CCB immediately does the following:
 - Preliminary screening to see if it contains the required information as per 1. If not, ask the requester for more information. If yes, proceed below.
 - Preliminary classification review to see if CCB concurs with requester's claim. If no, suggest a reclassification to the requester then proceed. If yes, proceed below.
 - Forward the change request to GDE Chair, EC, RDB and DCB.
 - Post and publish the Request-to-Queue at a designated web repository.
 - CCB will make best efforts to complete the entire set of preliminary actions here within 1 week per each Change Request.

5. Class 0 Review

- For each Change Request of Class 0 category, at least one CCB member will be assigned (designated reviewer) to draft an assessment report within 1 week.
- The draft assessment is submitted for review within the whole CCB for at least 1 week.
- The CCB chair and the designated reviewer(s), with inputs as found from CCB members, create the CCB assessment report within 1 week.
- CCB chair may call a public hearing (either as an electronic bulletin board or as a physical / video meeting) during the Class 0 review as deemed appropriate.
- The CCB assessment report is sent to the requester with cc: to GDE chair, EC, RDB, DCB and CCB, and is posted on the designated web location.
- If no objections or reports of errors are submitted within 1 week, the CCB assessment is considered accepted.
- In practice, CCB shall make every possible effort to complete each of the entire review-acceptance cycles within at most two weeks.

6. Class 1 Review

- For each Change Request of Class 1 category, at least two CCB members will be

CCB Proc'0.6

co-assigned (designated reviewer) to prepare, together with the CCB chair, a draft assessment report within 2 weeks. The CCB chair may ask a few members of non-CCB members to participate in preparation of the draft assessment report.

- The draft assessment is submitted for discussion within CCB for at least 1 week. CCB seeks opinions and inputs from GDE Director, EC, RDB and DCB at the same time. The CCB chair also will call a public hearing in the form of an electronic bulletin board. With consultation with EC the CCB chair may call this public hearing as a physical / video meeting as well.
- The CCB chair and the designated reviewer, with inputs as found in the due course, create the CCB assessment report within 1 week.
- The CCB assessment report is sent to the requester with cc: to GDE chair, EC, RDB, DCB and CCB, and is posted on the designated web location.
- If no objections or reports of errors are submitted within 1 week, the CCB assessment is considered accepted.

7. Class 2 Review

- For each Change Request of Class 2 category, at least three CCB members will be co-assigned (designated reviewers) to prepare, together with the CCB chair, a draft recommendation within 2 weeks. The CCB chair, the GDE Director and EC may ask a few members of non-CCB members to participate in preparation of the draft recommendation.
- The draft recommendation is submitted for discussion within CCB for at least 2 weeks and is posted at the designated location on the web. CCB seeks opinions and inputs concerning the draft recommendation from GDE Director, EC, RDB and DCB during this same time. GDE Director, EC and CCB chair will also call a public hearing during this Class 2 review in the form of an electronic bulletin board, as well as physical / video meetings.
- The CCB chair and the designated reviewer, with inputs as found in the due course, create the CCB recommendation report within 2 weeks, and send it to GDE Director and EC for approval.
- GDE Director and EC are the final decision making body for Change Request of Class 2.

8. Appeals

- Except for cases where Review process was determined to have been constrained by formal errors, all decisions on Change Requests by CCB (or by GDE Director and EC in case of Class 2 items) are considered final.
- However, reconsideration of previous decisions may be requested in the form of a new Change Request, which includes an assessment of new R&D results or new analyses.

End

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- three-page description of change control procedure
- authorized person submits change request (CR)
- classification according to impact, e.g. relevance and cost
- preliminary communication and handling
- CR: review – recommendation – discussion – decision
- document: revision – change execution – change approval

BCD Change History in ILC Wiki Web

ILC Configuration Main

Change History

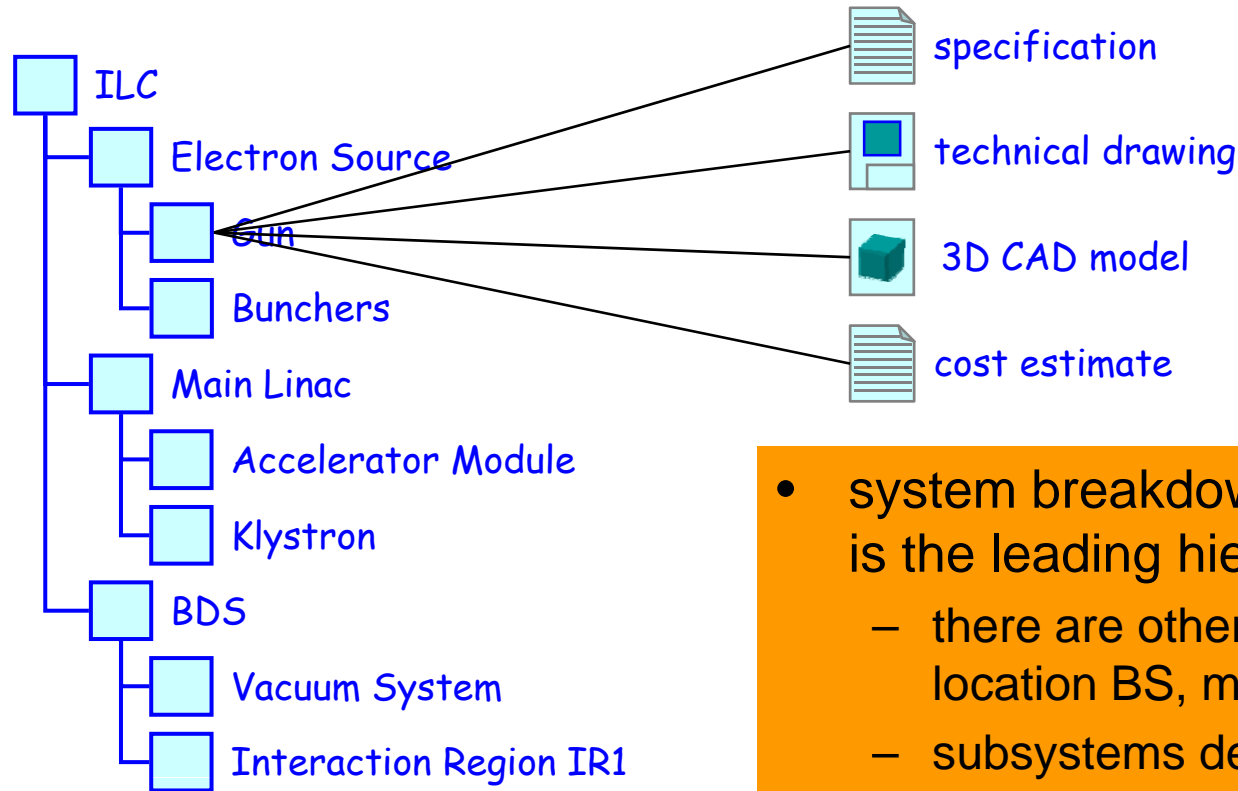
- March 12, 2007 - Updated BDS (single-IR, two-detector push-pull)
- March 4, 2007 - Updated RTML (to accommodate centralized DRs).
- Dec. 1, 2006 - Updated Electron Source
- Nov. 5, 2006 - Updated Parameter and Layout (Centralized DR installation around IR)
- Nov. 2, 2006 - Updated: Beam Delivery (Surface assembly of detectors)
- Sep. 23, 2006 - Updated: Beam Delivery (Muon spoiler implementation)
- Sep. 21, 2006 - Updated: Damping Rings (single ring for positrons)
- Sep. 21, 2006 - Updated: Beam Delivery (14mrad/14mrad crossing angle)
- July 13, 2006 - Updated: Main Linac (layout of Q-steering-BPM packages)
- May 8, 2006 - Updated: Parameter (with the new Layout subsection)
- Apr. 23, 2006 - Updated: Beam Delivery (Fix broken links)
- Apr. 23, 2006 - Updated: Ring-to-Main-Linac section (Maintenance update: consistency with the latest lattice)
- Mar 28, 2006 - Updated: Ring-to-Main-Linac section (Beam diagnostic station in the upstream end)
- Mar 23, 2006 - Resotored missing Fig.1 in "Number of ILC Tunnels" section in the BCD White Papers (Fig.1 was lost during the archival process in Jan., 2006).
- Mar 16, 2006 - Updated: Conventional Facility and Siting section (Asian sample site)
- Mar. 3, 2006 - Updated: Parameter Section (Linac Angle)
- Mar. 3, 2006 - Updated: Ring-to-Main-Linac section (Layout)
- Feb. 27, 2006 - Updated: Damping Ring section (RF frequency)
- Feb. 4, 2006 - Updated: Operations and Availability section.
- Dec. 20, 2005 - Updated: Conventional Facility and Siting section.
- Dec. 12, 2005 - Initial Release, accepted by GDE at Frascati, Italy

- change management performed by Nobu Toge
 - history kept at wiki web
- baseline configuration document (BCD) → single document for RDR
 - does not scale wrt distributed work, versioning, alternatives studies, etc.

baseline configuration → set(s) of documents along hierarchical structures

- system breakdown structure
- related documentation: drawings, notes, cost studies

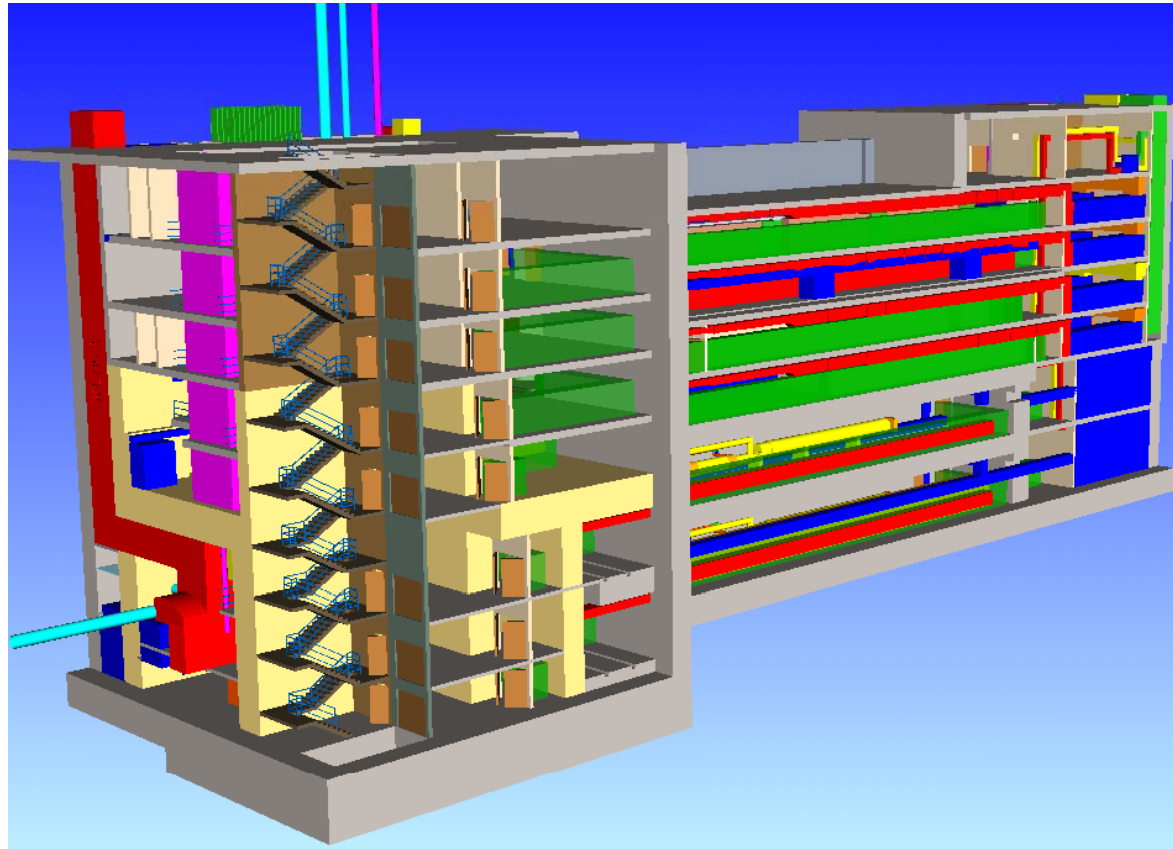
Controlling Hierarchies



- system breakdown structure is the leading hierarchy
 - there are others: work BS, location BS, maintenance BS, ...
 - subsystems described by variety of independently authored docs

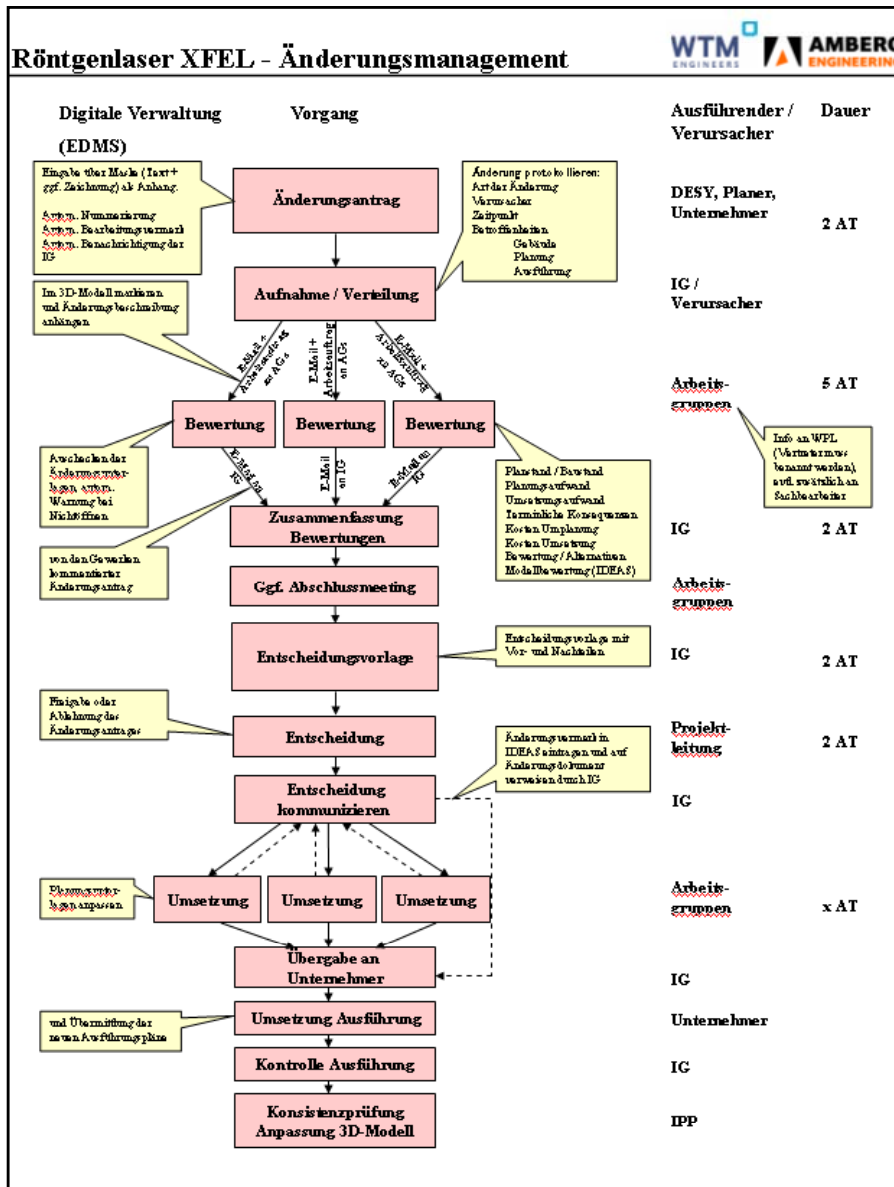
- change management objectives include
 - control individual items in hierarchy
 - maintain consistency of hierarchy
 - keep track of versions (and version compatibility)
 - consider alternatives for sub-hierarchies (→ configurations)

Change Management Requirements at XFEL



- provide change control for frozen XFEL buildings
- affects a (huge) collection of documents and CAD data
 - > 500 items for planning approval, not counting 3D CAD data

XFEL Requirements



- change control process proposed by IG and TC:
 - authorized person submits change request
 - reviews by working groups
 - recommendation
 - meetings and discussion
 - decision by project mgt
 - revision of CAD data etc.
 - change execution
 - collision checks et al.
 - change approval

XFEL Change history in EDMS

EDMS ID	Name	Description	Project Name
		Vorabversion	XFEL
Planfeststellungsunterlagen,A,1,1	Planfeststellungsunterlagen	01.03.2005	XFEL
Planfeststellungsunterlagen,A,2,1	Planfeststellungsunterlagen	Vervielfältigung	XFEL
Planfeststellungsunterlagen,A,3,1	Planfeststellungsunterlagen	Abgabe	XFEL

Name	State	Name
Planfeststellungsunterlagen,A,3,1	Working	XFEL
Supersedes		
Has Members		
PFU UEB-01 Übersicht	Released	XFEL
PFU Kapitel 11.3 Sicherheitskonzept	Released	XFEL
PFU XHM 2D-Zeichnung	Released	XFEL
PFU XHC 2D-Zeichnung	Released	XFEL
PFU XSE 2D Zeichnung	Released	XFEL

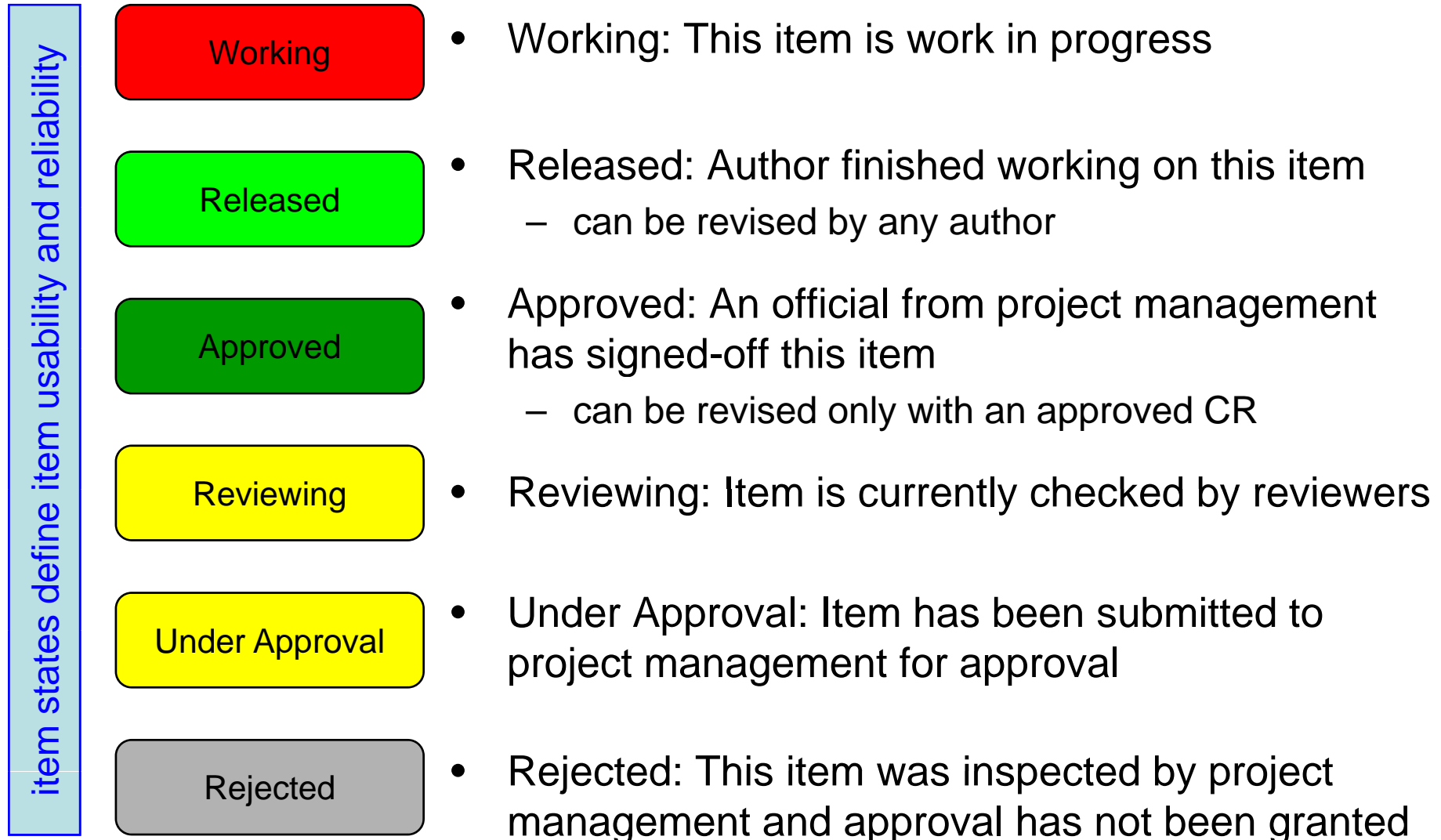
- planning approval documentation is stored in EDMS
- evolving documentation is captured in baselines

Agenda

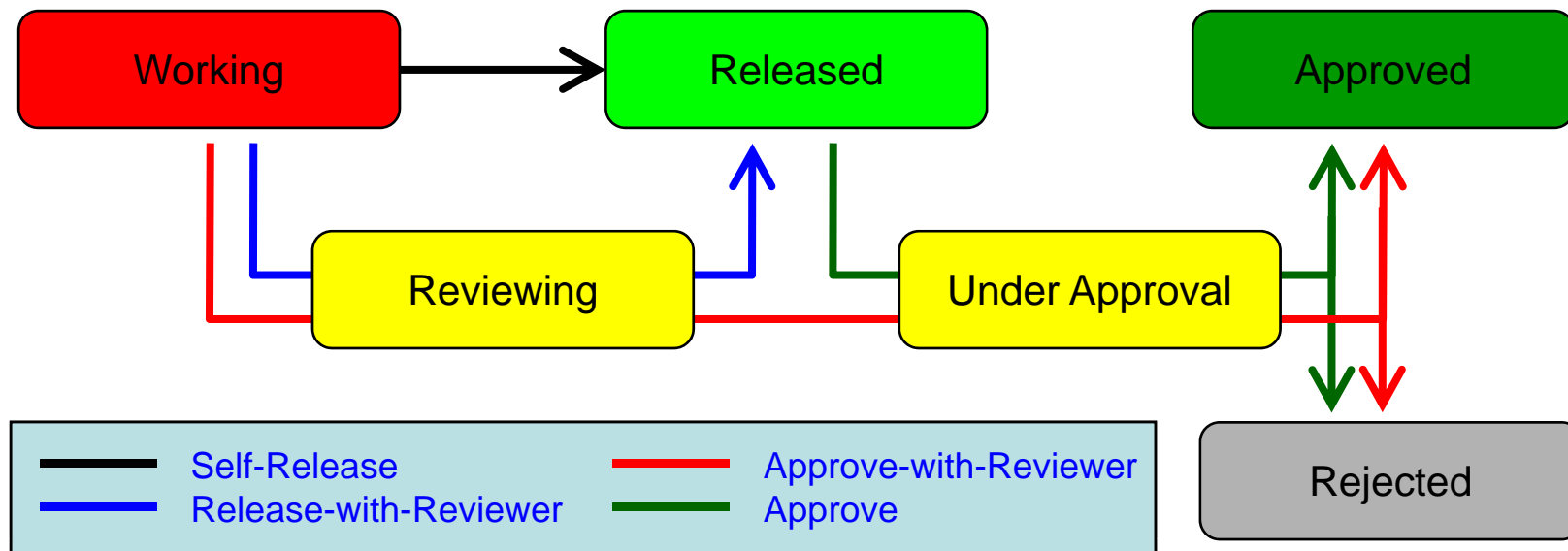
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Item Lifecycle States in ILC EDMS

The EDMS is managing items, such as documents, drawings, components, baselines ...



Lifecycles and Item States



- EDMS provides lifecycle (workflow) support for reviewing, releasing and approving items
- lifecycle activities are captured in the item history

Lifecycle States in EDMS

My Teams: PETRA_Bau_Team: A_Architektur: ADT_Details - Microsoft Internet Explorer

Address: http://teamcenter.desy.de:2345/TC51PRD/controller/home

Search: _____ Home Exit DESY

Advanced Search... Lars Hagg

Main Menu Explorer

Check Out From Team Put to WIP Vault Make Available To Team Route Move More Actions...

Lists: Work Lists, My Lists, My Teams

Create: Part, Documents, Others ...

Preferences: My Preferences, Change Password, Change User Data

Help: Contents And Index, About Teamcenter, DESY Impressum, Copyright 2006

You are here: PETRA_Bau_Team: A_Architektur: ADT_Details

EDMS-ID	Name	Description	Life Cycle State	Project Name	Class
D00000000912581.A.1	PIII_ADT_EX_0000_00_111	Geb 47c, Fugenausbildung Sohle	Under Approval	PETRA_Bau	Drawing
D00000000912501.A.1	PIII_ADT_EX_0000_00_111	Geb 47c, Detail Brandwand in Achse 00	Under Approval	PETRA_Bau	Drawing
D00000000912421.A.1	PIII_ADT_EX_0000_01_111	Geb 47c, Halterungskonstruktion HLSK Wand in Achse B	Under Approval	PETRA_Bau	Drawing
D00000000877821.C.1	PIII_ADT_EX_0000_01_111	Experimentierhalle Fassadendetails Ansicht Ost Achse 20-19	Working	PETRA_Bau_Team	Drawing
D00000000877821.C.1	PIII_ADT_EX_0000_01_111	Experimentierhalle Fassadendetails, Ansicht West Achse 41-42	Working	PETRA_Bau_Team	Drawing
D00000000878041.B.1	PIII_ADT_EX_0000_01_111	Experimentierhalle Fassadendetails, Ansicht West Achse 43-44	Approved	PETRA_Bau	Drawing
D00000000879901.B.1	PIII_ADT_EX_0000_01_111	Petra III, Gebäude 47c, Experimentierhalle, Fassadendetails, Ansicht Ost, Achse 43-42	Approved	PETRA_Bau	Drawing
D00000000878231.B.1	PIII_ADT_EX_0000_01_111	Experimentierhalle Fassadendetails, Ansicht Ost Achse 28-27	Approved	PETRA_Bau	Drawing
D00000000879951.C.1	PIII_ADT_EX_0000_01_111	Petra III, Gebäude 47c, Experimentierhalle Fassadendetails Ansicht Ost Achse 35-33	Working	PETRA_Bau_Team	Drawing
D00000000913501.A.1	PIII_ADT_EX_0000_01_111	Geb 47c Detail Rauchschürze, Achsen 9, 19, 29 und 39	Approved	PETRA_Bau	Drawing
D00000000903931.C.1	PIII_ADT_EX_0000_01_111	Dachdetails, Ansicht Süd, Anschluss Gebäude 48	Working	PETRA_Bau_Team	Drawing
D00000000910811.A.1	PIII_ADT_EX_0000_01_111	Geb. 47c, Fassadendetails Ansicht Ost Geb. 47c, Fassadendetails, Ansicht Ost, Anschlussdetails (exemplarisch Achse 20)	Approved	PETRA_Bau	Drawing
D00000000894421.B.1	PIII_ADT_EX_0000_01_111	Geb. 47c, Detail T 30-Stahltür	Approved	PETRA_Bau	Drawing

*** omfsvr <27100> low_freespace: memory is already free
 *** omfsvr <27100> low_freespace: memory is already free
 You have 4 assignments in this Work List.

Applet com.sdrc._metaphase.wcc.sharedlogin.SharedLoginApplet started

Snapshot from PETRA III construction drawing review: Building details (left) and more progressed floor plans (below)

Internet Explorer

Address: http://teamcenter.desy.de:2345/TC51PRD/controller/home

Search: _____ Home Exit DESY

Advanced Search... Lars Hagg

WIP Vault Make Available To Team Route Move More Actions...

Team: A_Architektur: AGR_Grundrisse

Architecture: AGR_Grundrisse

EDMS-ID	Description	Life Cycle State	Project Name	Class	Cr
R_EX_0000_01_110	Geb. 47c, Dachaufsicht EX 01	Approved	PETRA_Bau	Drawing	Se
R_EX_0000_02_110	Geb. 47c, Dachaufsicht EX 02	Approved	PETRA_Bau	Drawing	Se
R_EX_0000_03_110	Geb. 47c, Dachaufsicht EX 03	Approved	PETRA_Bau	Drawing	Se
R_EX_0000_04_110	Geb. 47c, Dachaufsicht EX 04	Approved	PETRA_Bau	Drawing	Se
R_EX_EG00_00_13C	Kühlwasserhalle Grundriss EG	Working	PETRA_Bau_Team	Drawing	Se
R_EX_EG00_01_11C	Petra III, Gebäude 47c, Experimentierhalle Grundriss EX01 Achse 00-11	Approved	PETRA_Bau	Drawing	Se
D0000000088015.B.1	Petra III, Gebäude 47c, Experimentierhalle Grundriss EX02 Achse 11-24	Approved	PETRA_Bau	Drawing	Se
D00000000880201.B.1	Petra III, Gebäude 47c, Experimentierhalle Grundriss EX03 Achse 24-37	Approved	PETRA_Bau	Drawing	Se
D00000000880251.B.1	Petra III, Gebäude 47c, Experimentierhalle Grundriss EX04 Achse 37-49/00	Approved	PETRA_Bau	Drawing	Se
D00000000884041.B.1	Geb. 47c, Experimentierhalle Grundriss EX 01, OG01	Approved	PETRA_Bau	Drawing	Se
D00000000884091.B.1	Geb. 47c, Experimentierhalle Grundriss EX 02, OG01	Approved	PETRA_Bau	Drawing	Se
D00000000884141.B.1	Geb. 47c, Experimentierhalle Grundriss EX 03, OG01	Approved	PETRA_Bau	Drawing	Se
D00000000884191.C.1	Geb. 47c, Experimentierhalle Grundriss EX04 OG01	Working	PETRA_Bau_Team	Drawing	Wi
D00000000848511.C.1	Hybridkühler Grundriss EG	Working	PETRA_Bau_Team	Drawing	Se
D00000000848461.B.1	Kühlwasserhalle - Grundriss Untergeschoss	Approved	PETRA_Bau	Drawing	Se

*** omfsvr <27100> low_freespace: memory is already free
 *** omfsvr <27100> low_freespace: memory is already free
 *** omfsvr <27100> low_freespace: memory is already free
 You have 4 assignments in this Work List.

Applet com.sdrc._metaphase.wcc.sharedlogin.SharedLoginApplet started

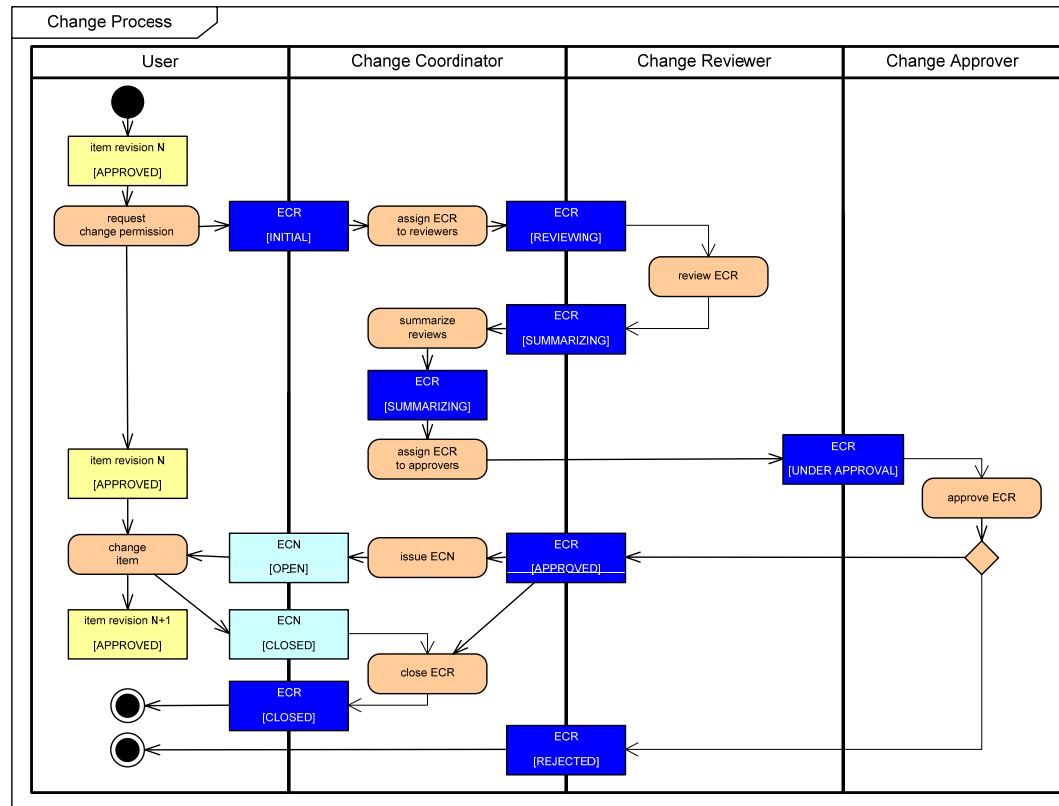
Reviewer Markups in EDMS

The screenshot displays the Adobe Acrobat Professional interface with a technical drawing of a building section. The drawing includes a cross-section labeled 'Schnitt' and a floor plan labeled 'Grundriss'. The software window title is 'Adobe Acrobat Professional - [PIII_ADT_EX_0000_01_11201_DF.pdf]'. The menu bar includes 'Datei', 'Bearbeiten', 'Anzeige', 'Dokument', 'Kommentare', 'Werkzeuge', 'Erweitert', 'Fenster', and 'Hilfe'. The toolbar contains various icons for navigation and editing. The left sidebar shows 'Leseseiten', 'Unterschriften', 'Seiten', 'Anlagen', and 'Kommentare'. The right sidebar shows a 'Gesehen' panel with 'ungeprüft' and a 'Notiz-Werkzeug' panel with various tool options. The main drawing area is covered with several review comments:

- Notiz:** Heuer_Rainer on 2007/08/07-14. Text: 'Das Geländer ist so richtig geplant, da Reserveraum für nachträgliche Rohrinstallation auf der Brüstung vorhanden sein soll.'
- Polygon:** Reichwald_Leifpeter_DFZ on 2007. Text: 'Falsche Zuordnung. Nur Unterseite farbig beschichtet.'
- Polygon:** Haenisch_Lindemar on 2007/07/31. Text: 'Anordnung Geländer linksbündig zum Überzug.'
- Polygon:** Haenisch_Lindemar on 2007/07/31. Text: 'Putz bis OK RFB, Übergang armieren.'
- Anmerkung:** Faesing_Markus on 2007/07/30-15:37:0. Text: '3 Kabeltrischen? (Kabel DN 150 ist schon ordentlich...) Die Bezeichnung sollte besser 3 Rohhalter heißen.'
- Notiz:** Heuer_Rainer on 2007/08/07-14. Text: 'Der Plan ist zur Ausführung freigeben, wenn die Eintragungen der Prüfer umgesetzt werden.'
- Notiz:** Weng_Stefan_DanzFM on 2007. Text: 'Formal in Ordnung.'

The bottom status bar shows '1 von 1' and navigation icons.

Change Process in EDMS



change request (CR)

assign reviewers

review

summarize recommendation

assign approver

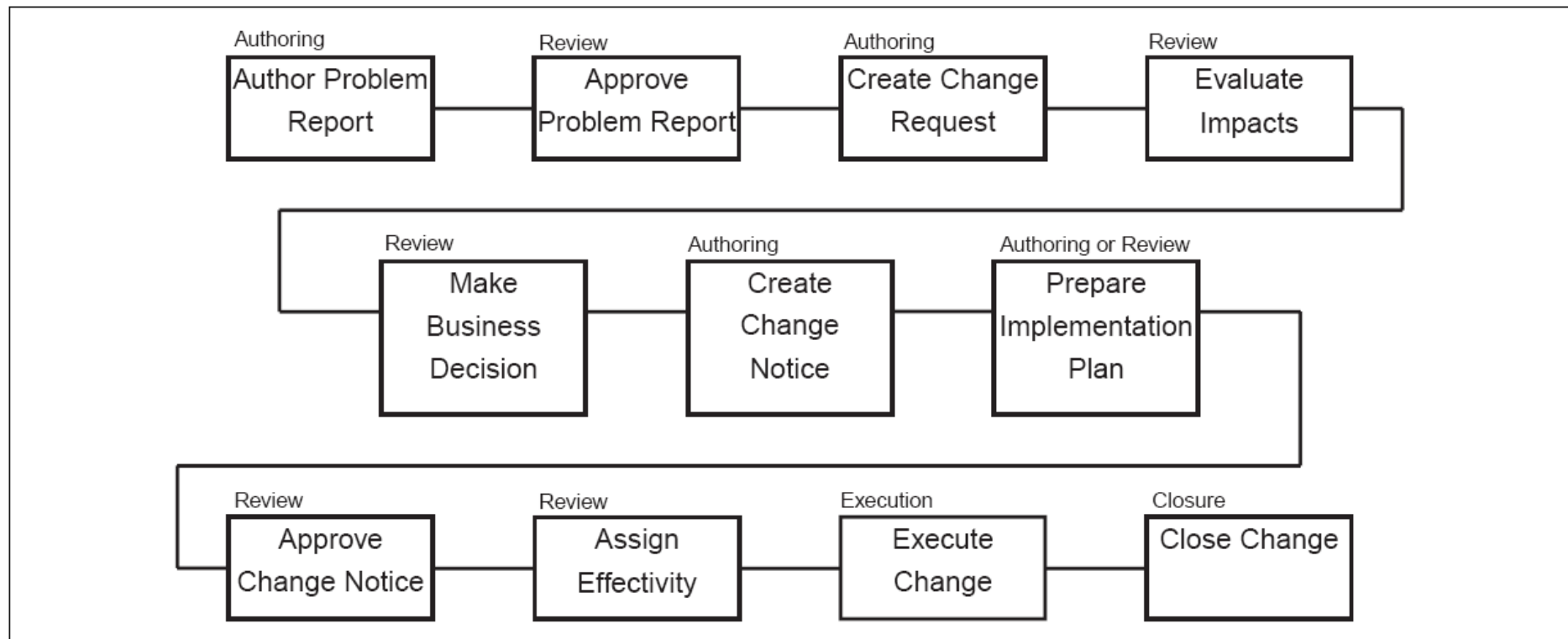
approve (final decision)

execute change

close change request

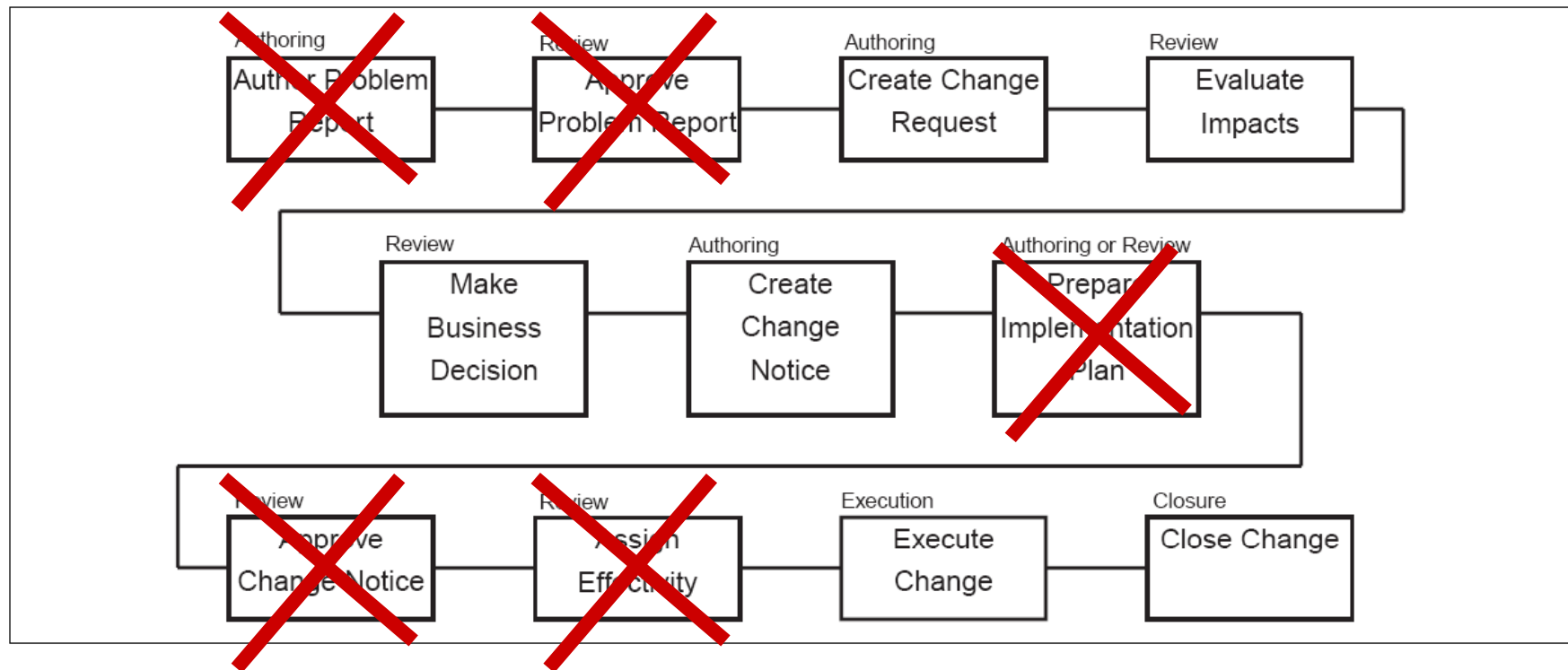
- need Change Request (CR) to revise item
- CR to be reviewed and approved like any other item
- need to assign change coordinator, reviewer and approver
- available approx. end of September

CM II Change Management Process



- CM II is an industry standard for conduction change mgt
- change process addresses large-scale organizations
- CM II puts strong requirements on the organization
- CM II can be used as a guideline – goal “rightsizing”

Sidebar on Change Process Implementation



- EDMS is CM II certified → supports full CM II processes
 - many user roles, many forms and reports, lots of planning
- implementation maintained essential required activities, but stripped off non-essential actions and documents
 - strategy: KISS – keep it simple & stupid
 - can seamlessly scale to CM II (if anybody is keen on it)

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Change Management Requirements

- XFEL and ILC have comparable functional req's
 - request – review – recommend – discuss – decide
 - revise – execute – approve
- different organizational boundary conditions
 - CM for ILC sounds centralized and by decree
 - formalize documentation, channel communication
 - CM for XFEL sounds local and on demand
 - lots of meeting are in place, adequate for the time being

Considerations for CM Introduction

- when implementing CM there should be items which can be put under change control
 - start with release and approval – that's hard enough
- CM puts requirements on the project organization
 - appoint coordinators, reviewers, approvers
 - formalize documentation: specs, planning, budgeting
 - the more formal the CM, the stronger the boundary cond's
 - if not observed, CM will not work

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