

Summary: Configuration Management Conference

July, 2nd: Pre-Conference:
Tutorial about the CMII Model

July 3rd & 4th, 2007, AIRBUS, Hamburg

Organizers:

- ◆ AIRBUS CIMPA
- ◆ Gesellschaft für Konfigurations Management (GfKM)
- ◆ Institute for Configuration Management (ICM)

DESY Participants:

- ◆ Frank Lehner (ILC)
- ◆ Riko Wichmann (XFEL)

Configuration
Management
Conference

 CMII Europe 2007

CMII Tutorial

- ◆ given by Steve Easterbrook, ICM Vice-President
- ◆ Summary of the CMII Certification Course
- ◆ 42 Participants with **up to 15 (!) years of experience** in CM
- ◆ CMII Timeline:
 - ▶ 1977-1985: Development of basic CMII principles as **Best Practice**
 - ▶ 1986: Start Training and Certification Program
 - ▶ 1986-today: Continuous Improvement
- ◆ “CMII provides a business process infrastructure that enables all activities to perform their tasks reliably and efficiently”

CMII Tutorial: “A requirement is not a requirement unless it's documented, validated and released”

CMII: An Integration of the Following

Configuration Management

Ensures that configurations conform to their requirements.

Requirements Management

Ensures that documented requirements are clear, concise and valid.

Change Management

Closed-loop process for changing released documents and data.

Release Management

Ensures that documents are authorized and released prior to use.

Data Management

Ensures that supporting data bases and data sets are accurate and secure.

Records Management

Retains traceability of all work and proof that the results conform.

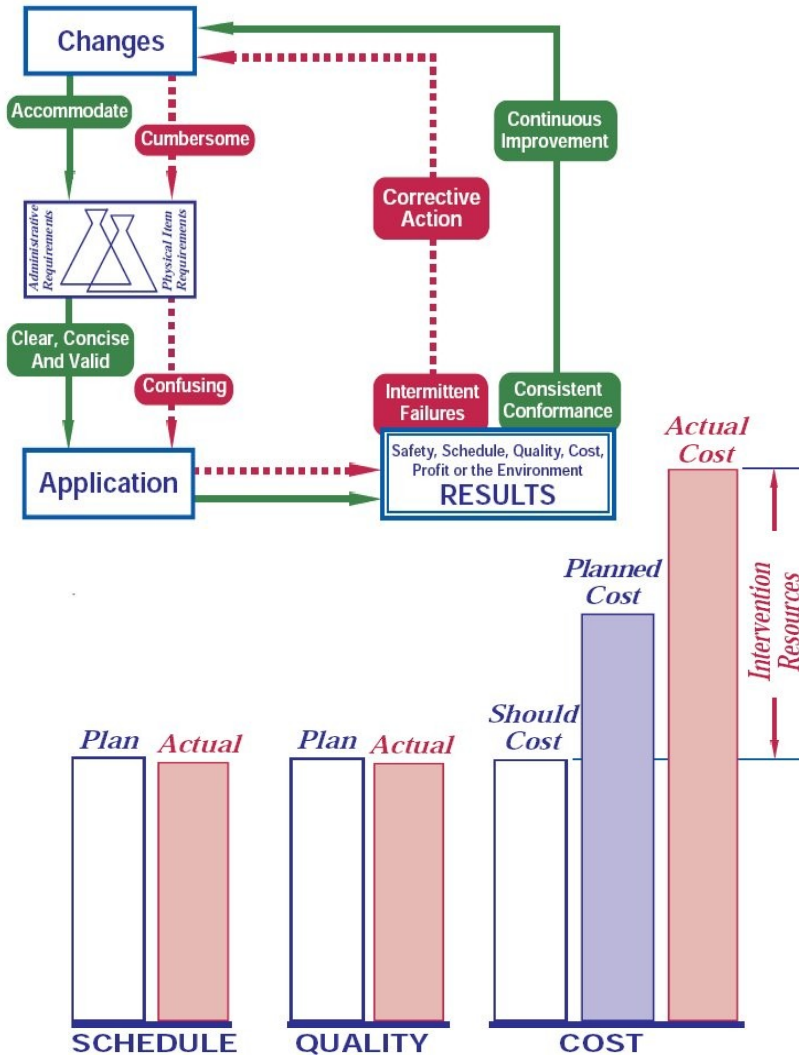
Document and Library Control

Protects knowledge assets and prevents unauthorized changes.

Enabling Software Tools

Serve to enhance overall process reliability and efficiency.

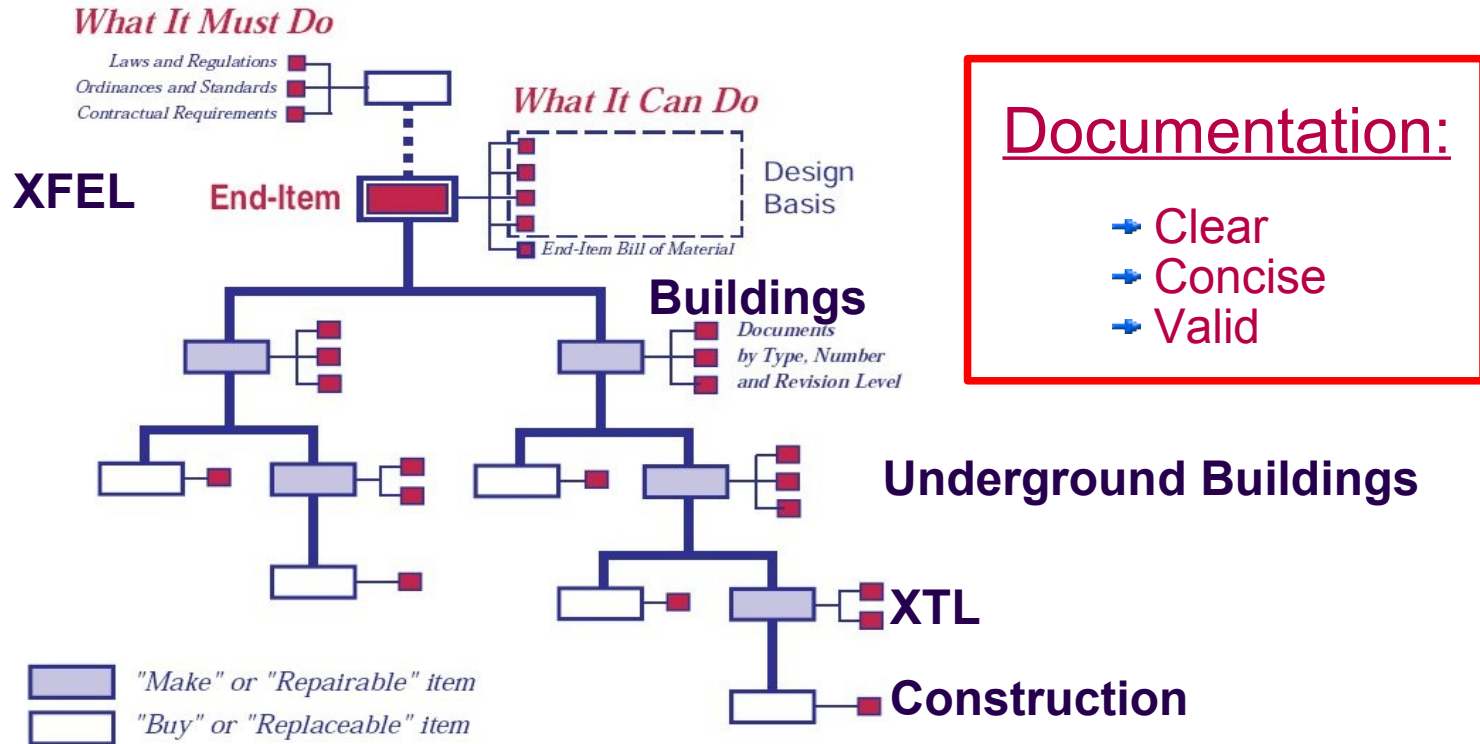
CMII Tutorial: Corrective Actions



- ◆ **Corrective Action:** extra effort to correct something, which should not have happened in the 1st place
- ◆ primary cause: **inadequate requirements and/or conformance to specification**
- ◆ most organizations spent **40-60%** of their resources on interventions
- ◆ **Intervention Resources** are spent on **Corrective Actions**
- ◆ reduce corrective actions: **clear, concise, valid requirements**
- ◆ CM: **accommodate change** and stay clear concise and valid

CMII: Ingredients 1 – Properly Structured Baseline

CMII: very documentation centric

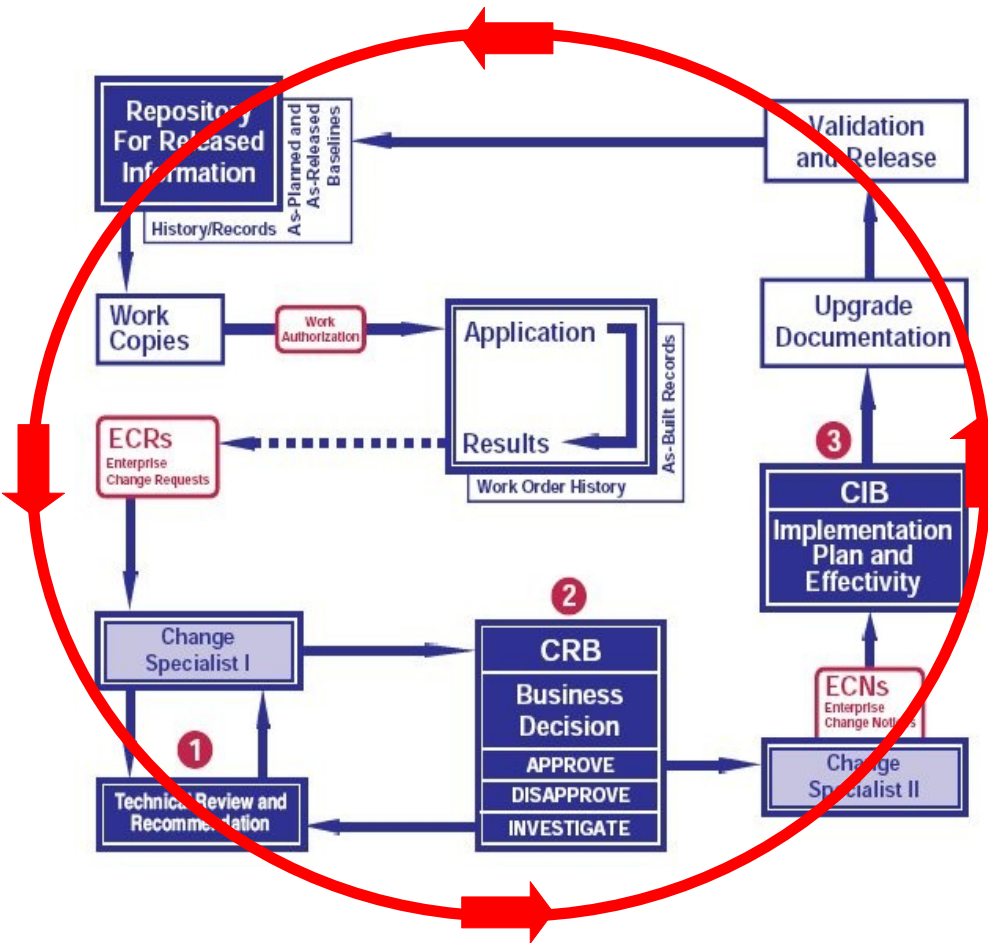


Documentation:

- Clear
- Concise
- Valid

- ◆ **Physical item hierarchies** are used as a framework for end item products, facilities and their associated requirements
- ◆ Each item has its set of **supporting documents/data**

CMII: Ingredients 2 – Closed Loop Change Process



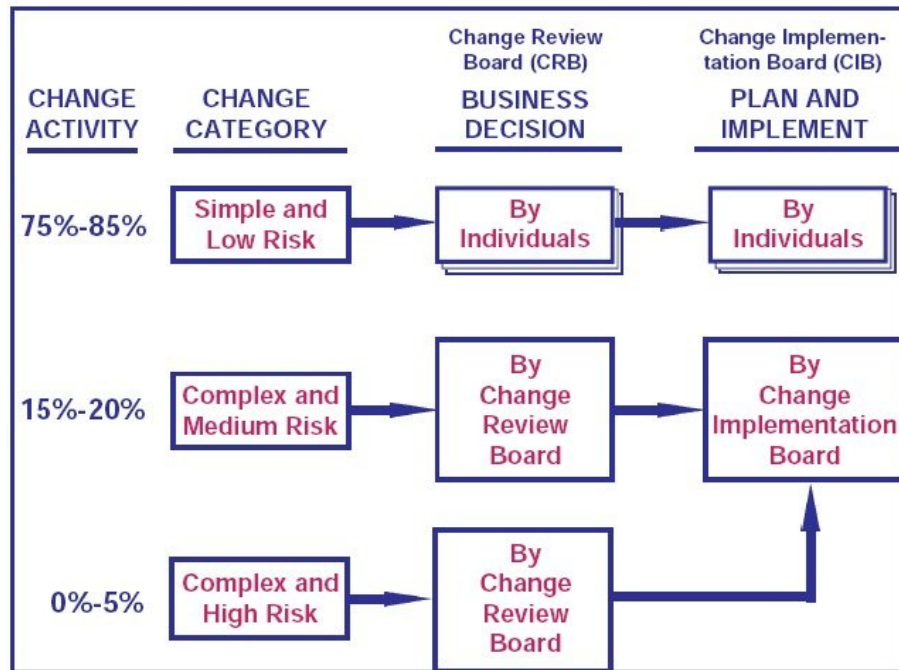
Feedback about the execution of the change must reach the initiator

Rules of the ultimate solution:

- (1) Documents must be validated prior to release.
- (2) Documents must be released prior to use.
- (3) Any detected deficiencies must be corrected prior to reuse
- (4) Results must conform to requirements in every case

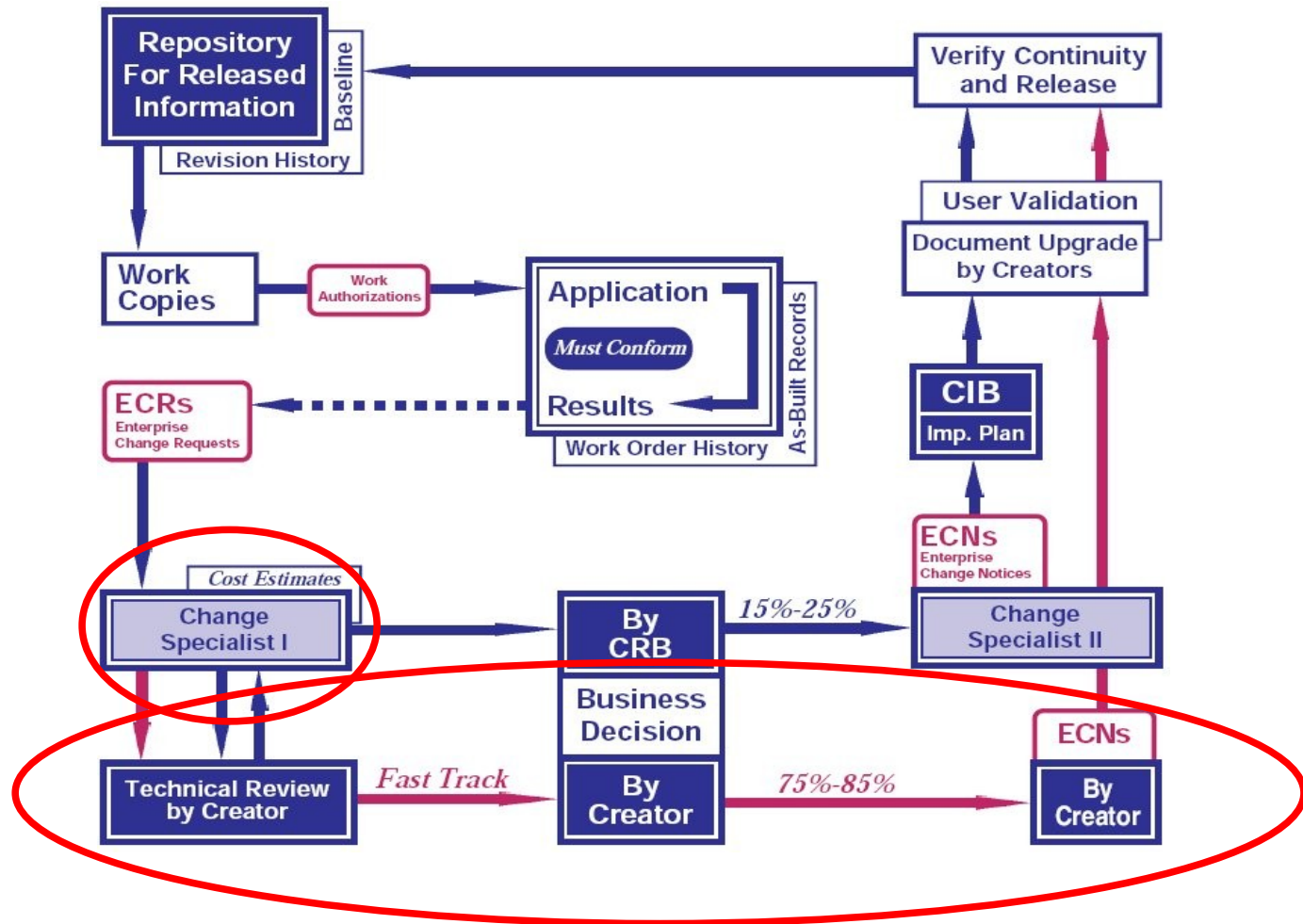
applies to process themselves (e.g. CM) !

CMII: Not all changes require full treatment!



75% - 85% of changes can be handled in a **Fast-Track Process**

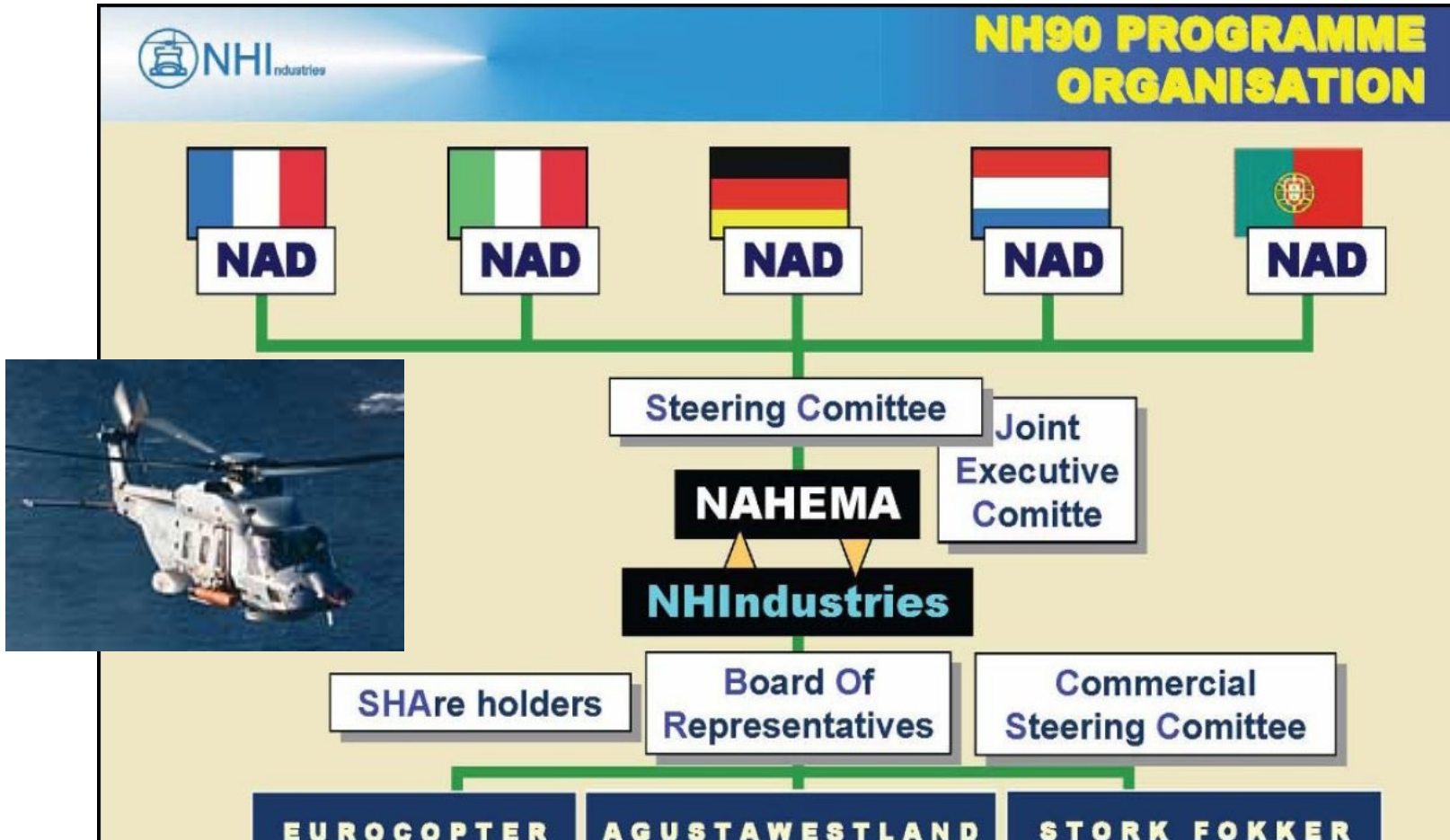
CMI: Ingredients 2 – Closed Loop Change Process with Fast Track



CMC 2007 Main Conference: Company Reports on CMII Related Experience

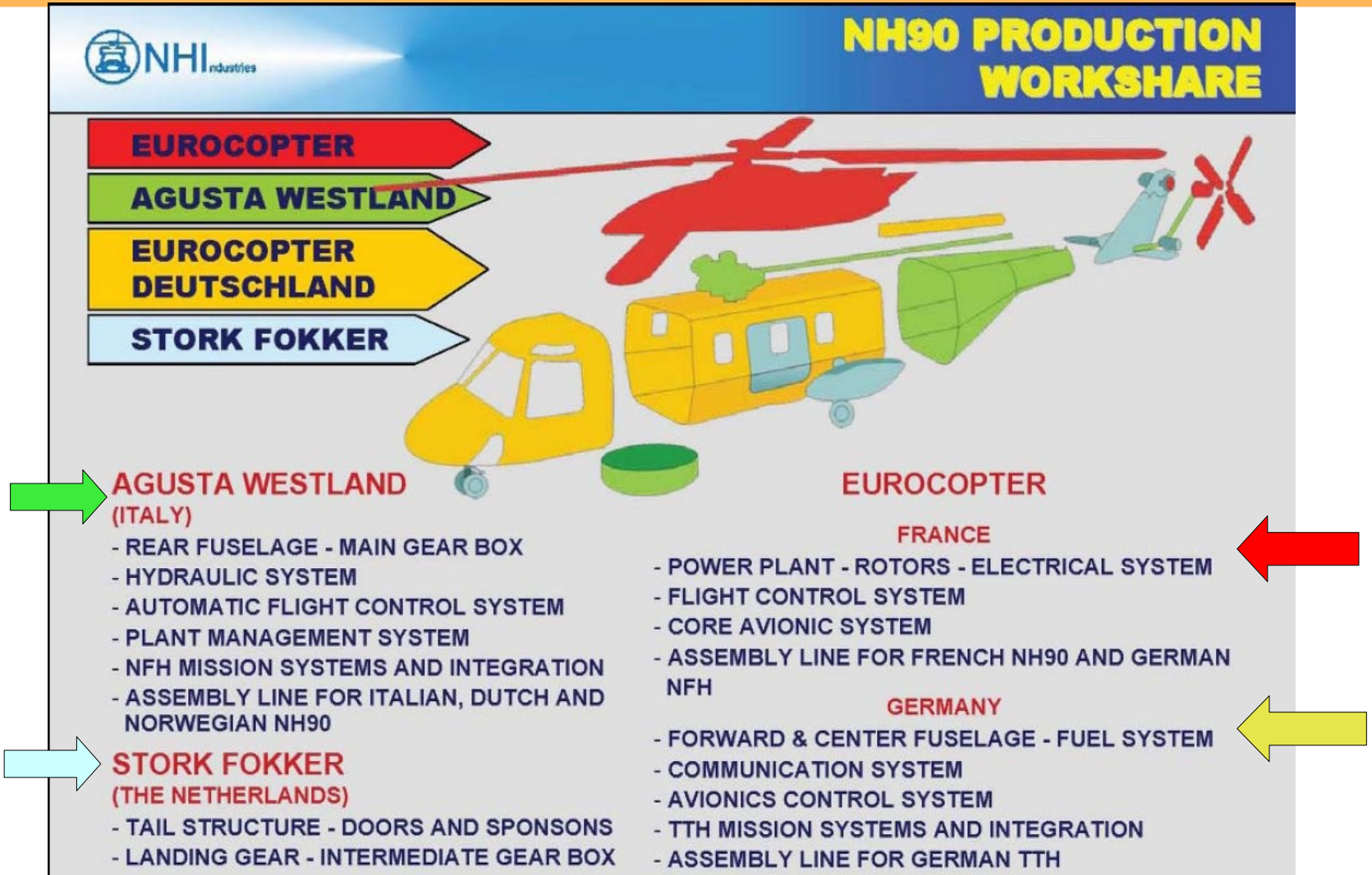
- ◆ 142 Participants
- ◆ Presentations by (non-selling) Organizations
 - ▶ NHIndustries (Eurocopter)
 - ▶ Embraer
 - ▶ NASA ISS
 - ▶ EADS Astrium Satellites
 - ▶ Delphi Automotive Systems
 - ▶ Airbus
 - ▶ EADS Defence Electronic
 - ▶ Microsoft
- ◆ **Dominated by Aviation and Space Industry**

NHIndustries: Multi-national Cooperation



**Christine-Anne Chevry,
Senior Manager Configuration Management, NHIndustries**

NHIndustries: Eurocopter international project



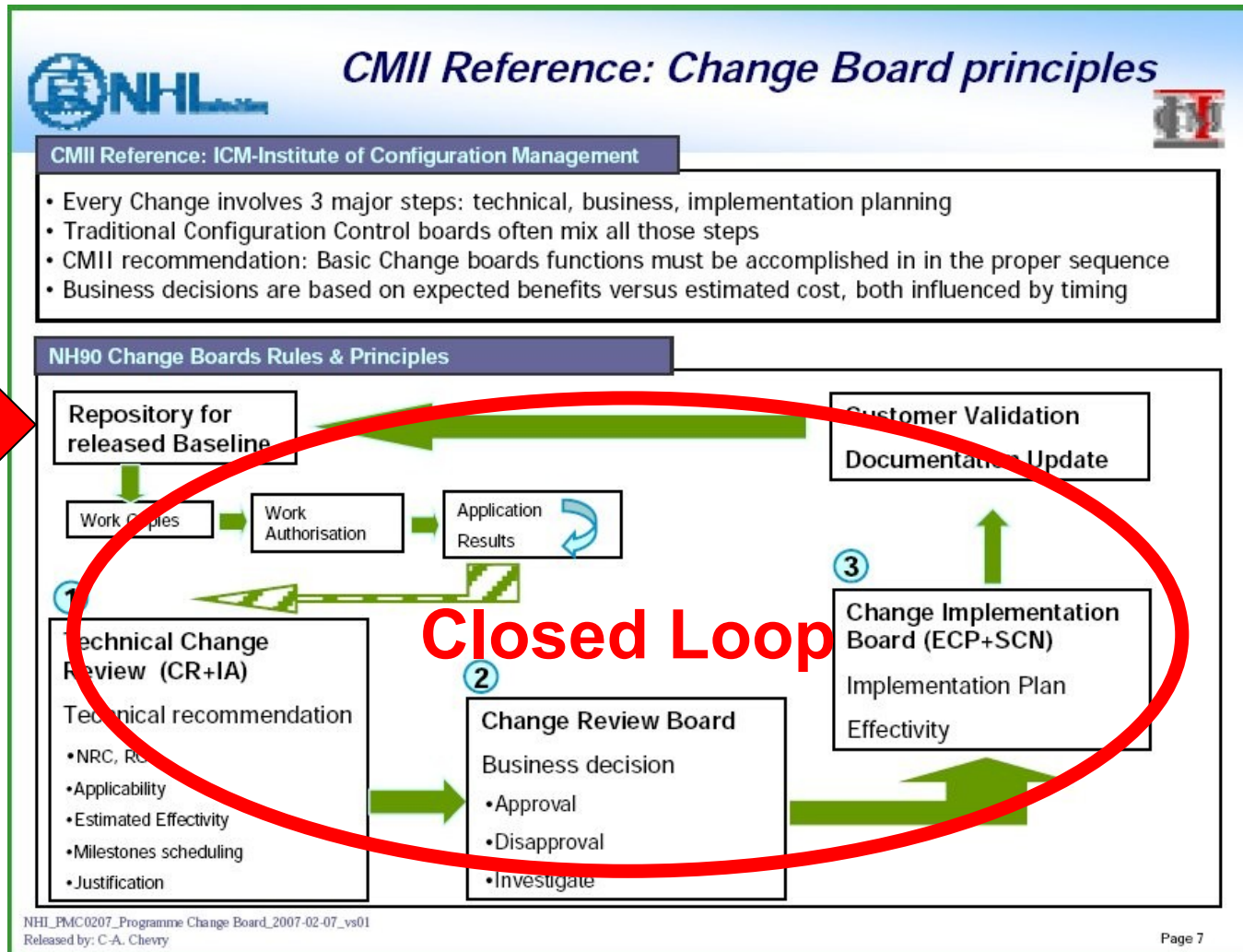
NHIndustries: Configuration Management Plan

- ◆ defined in 2001 (?)
 - ▶ requirements
 - ▶ configuration identification
 - ▶ change process
 - ▶ production CM documents

**long lead time for changes:
3 CB discussing costs, technical and business issues**

- ◆ Dec 2006: CM II training started for 20 employees
- ◆ Feb 2007: Program Change Board established

NHIndustries: Closed Loop Process w. Baseline



NHIndustries: Process => Key Performance Indicators => Tools



NH90 Change Boards *Process, KPIs then Tools*

- *Change Board efficiency KPIs*
- *CMRIP Selection Process Tools*

Change Board KPIs

KPI01_PCB Efficiency

1. **Number of ECPs signed in PCB**
 - Total number of ECPs signed in PCBs
 - Number of ECPs signed per PCB
 - Number of ECPs signed at latest PCB
2. **Leadtime ECPs presented in PCB -> Final release to customer**
 - Average Leadtime ECPs delivered after PCB
 - Top 10 max. Leadtime ECPs delivered after PCB
3. **Number of ECPs accepted by Customer**
 - Total number of ECPs signed in PCBs and accepted by Customer
 - Total number of ECPs refused by Customer, incl. reasons

KPI03_ECP Duration until closed

Average duration of closed Changes (Quarterly), according to Business objectives and Customer/market requirements

Selection Process Tools Core Messages

When we mention CM,
we mean **CMII!**

We must do what is defined (in the process descriptions)!

- Use the basic ideas, even if the definition is not (yet) finished or inconsistent

Implement central control!

- To at least H/C level

Use state of the art tool for central control!

- i.e. CMII

Involve the experts in further selection and implementation process!

- NHI, PC's, (EADS)



NASA: International Space Station

December 2006 configuration

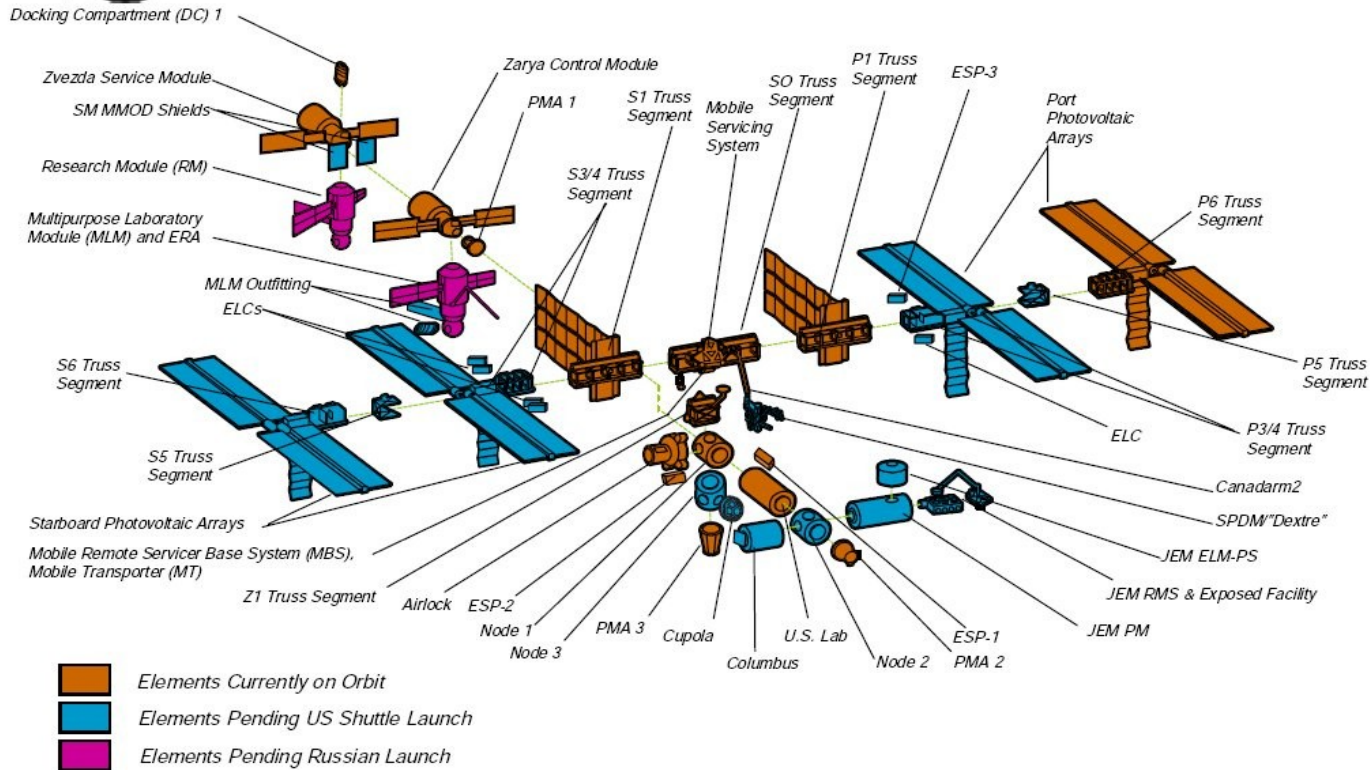


Ginny Stephenson,
Change Management Lead, NASA Johnson Space Center

NASA: International Space Station



ISS Final Configuration



Partners from 15 countries participate in ISS the program³

NASA: CM Process Improvement

- ◆ Starting situation:
 - ▶ well defined CM process in place since years
 - ▶ strong CM group
- ◆ Improvements
 - ▶ gap analysis by ICM in September 2004 (3 days)
 - ▶ implementation of recommendations
 - ▶ CM II briefing sessions with all departments
 - ▶ follow-up assessment August 2006



NASA: ICM findings/recommendations

- ◆ **fragmented baseline management**
- ◆ implement **closed-loop** change management and **couple to baseline**
- ◆ find automated tool:
 - ▶ workflow, online change creation, distribution, disposition, task identification, scheduling & tracking
- ◆ formal CMII training for ISSP CM group
- ◆ CMII overview for ISSP personnel
- ◆ **avoid “redline” documents and drawings**
- ◆ define **metric reporting for management**
- ◆ contractors to conform to NASA CM process
- ◆ continuously improve CM process (committee)



NASA: implementing CM improvements

- ◆ within ~2 years
- ◆ closed-loop in updated change request process with new/updated forms
- ◆ CMII certification and CMII briefings
- ◆ updated metrics => regular meetings with senior managers

CMII also for new space vehicle !!



NASA: Next Steps

- ◆ **integrate software tools**
- ◆ improve baseline databases
- ◆ continuously improve process
- ◆ reduce amount of signatures



EADS Astrium Satellites

Astrium Satellites

EADS Astrium

➤ Astrium's activities are based in three key areas

Astrium Space Transportation

The European prime contractor for civil and military space transportation and manned space activities



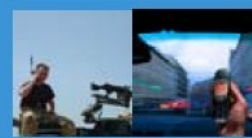
Astrium Satellites

A world leader in the design and manufacturing of satellite systems



Astrium Services

At the forefront of satellite services in the secure communications and navigation fields



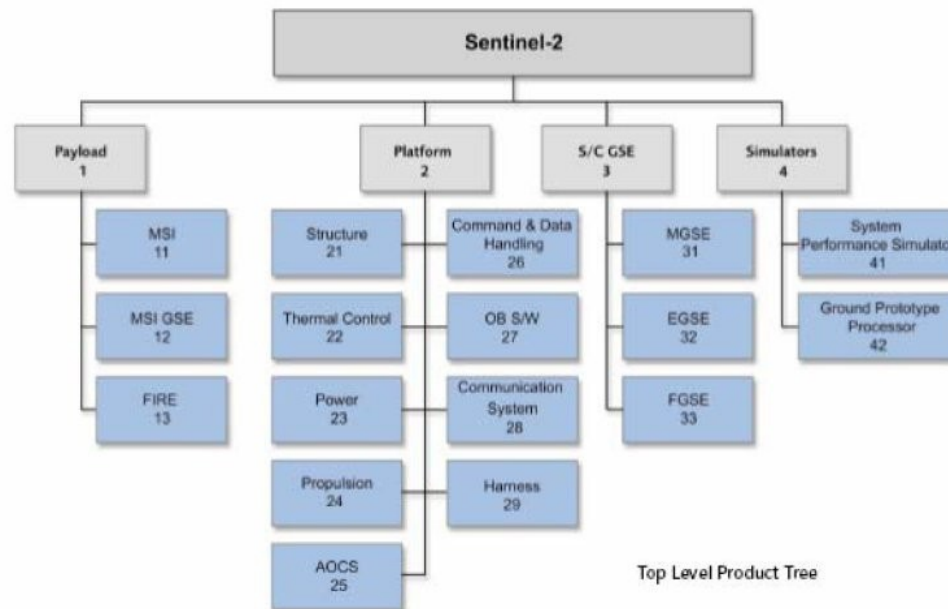
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Jochen Hagenkötter,
Senior Advisor Configuration Management, EADS Astrium

Astrium: Project Structure (similar to XFEL)

Astrium Satellites

Project Structure of a typical ESA Satellite Project



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will be transferred into a product structure as the project progresses

All the space you need

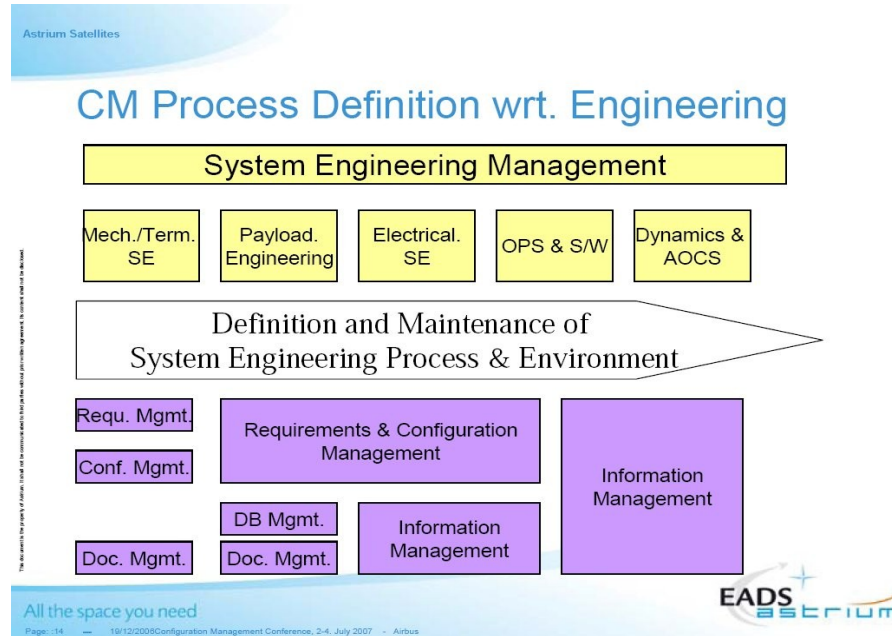
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Astrium: ESA CM Standards ECSS

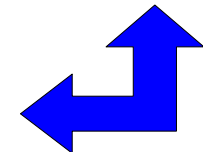
- ◆ Very similar to CMII standards
 - ▶ **configuration baseline** for approved status
 - ▶ baseline: all documentation that describe the characteristics of the product
 - ▶ evolution only by **formal change procedure** involving all disciplines
 - ▶ change disposition **via Change Control Board (CCB)**
- ◆ Change Boards on all levels:
 - ▶ ESA <-> EADS
 - ▶ EADS <-> sub-contractor
 - ▶ sub-contractor <-> vendor

Astrium: ECSS on the way to CMII



ECSS

CMII



- ◆ bring all CM related activities under one umbrella
- ◆ currently ECSS is 85% CMII
 - ▶ standardized baselines, adapt CMII processes, harmonize forms, templates, etc for all space companies

Embraer: Process Improvement in Aerospace

Supply Chain Management Strategies



Global Suppliers are coming to Brazil



Brazilian Content:

- Faster response time
- Reduced cycles
- Base for exports



FAMILY ERJ 145
• 4 partners
• 350 suppliers



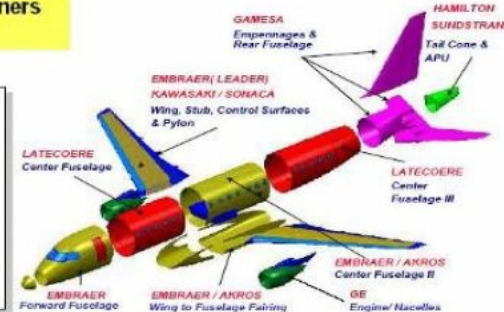
FAMILY EMBRAER 170/190
• 16 partners
• 22 suppliers



**16 Risksharing Partners
22 Suppliers**

System Partners:

| | |
|---------------------|---|
| HAMILTON SUNDSTRAND | Air Management |
| PARKER | Electrical System Hydraulics Flight Controls Fuel System |
| C & D | Interiors |
| LIEBHERR | Landing Gear |
| HONEYWELL | Avionics |



**Manoel de Queiroz C. Santos,
Configuration Engineer, Embraer**

THE INFORMATION CONTA

ER'S WRITTEN CONSENT

Embraer: Advices

- ◆ get upper management to buy-in (ICM advice)
- ◆ be visible (ICM advice)
- ◆ implement CMII principles step-by-step
- ◆ understand culture in your organization and identify what is necessary to change that
- ◆ **think process first, tools should follow!!**

“Commercial To-Sell” Presentations

- ◆ Airbus CIMPA, HH
 - ▶ consulting for product lifecycle management in aviation industry
- ◆ PTC
 - ▶ software for product lifecycle management (PLM)
 - ▶ CMII certified

Siemens UGS: Product Lifecycle Management SW

UGS: Transforming Aerospace & Defense *from requirements to retirement*

SIEMENS



Manages > 90% of all A&D mega-enterprises

A&D “Innovation Breakthroughs” enabled:

- Lockheed Martin: JSF Program
- Eclipse 500 Very Light Jet Program
- Boeing EDM Decision for all Programs
- IAI GS 150/200 Program
- GE Aircraft Engines
- MTU Aero Engines

UGS Delivers 3 Millionth Teamcenter License in 2006, Capping Successful Year for PLM Industry’s Leading Software

Customer satisfaction, retention and scalability cited as key contributors to unprecedented milestone

PLANO, Texas UGS Corp., a leading global provider of product lifecycle management (PLM) software and services, today announced its Teamcenter® software portfolio surpassed the three million license mark near the end of 2006.

**UGS: the unequivocal industry leader
for A&D innovation & enterprise productivity**

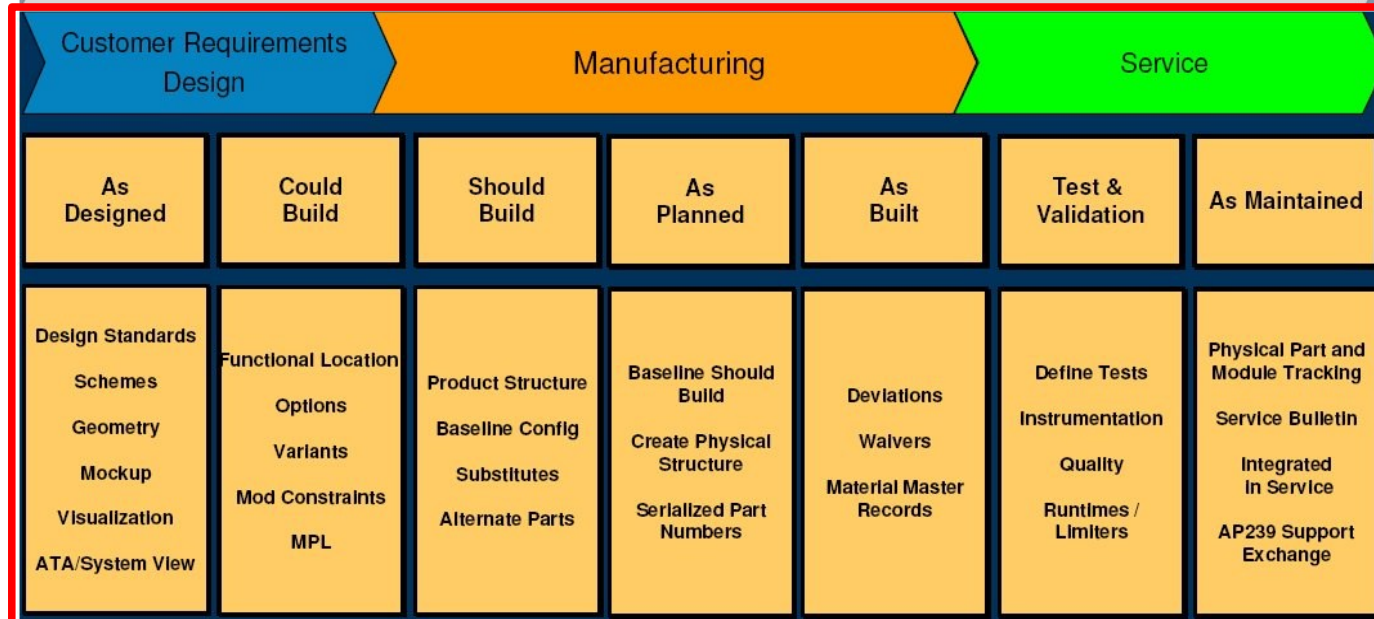
UGS: Product Lifecycle Management SW

SIEMENS

PLM Scope – Lifecycle Representations

Programm Management

Supply Management - Change Management and Control & Release - Document Management - Audit Support - Status Accounting



Most of this we have to do, too !

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UGS PLM Software

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 - ▶ CMII certified
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 - ▶ CMII conform
 - ▶ supply 90 % of the world PLM software (in aviation)
 - ▶ **Teamcenter !**

Think process first – Tools should follow!

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Think process first – Tools should follow!