

ATA iSpec 2200

Technische Dokumentation in der Luftfahrt-Industrie



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Technische Dokumentation in der Luftfahrt-Industrie

Liebherr-Aerospace

www.lia.liebherr.com

Tanner/DGLR Forum
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1. Liebherr-Aerospace

Produkte/Systeme: Klima, Betätigung, Fahrwerk, Hydraulik, Elektronik

Standort	Anzahl Mitarbeiter	Technische Dokumentation
Lindenberg / Germany	1600	*
Toulouse / France	630	*
Saline / USA	40	
Singapore	25	
Montreal / Canada	9	*
Shanghai / China	2	
ELEB ^{*)} / Brazil	420	*

^{*)} Embraer Liebherr Equipamentos do Brasil (40%)

2. Neue Anforderungen der Kunden an die Technische Dokumentation in der Luftfahrt

ATA iSpec 2200

Aircraft Maintenance Manuals (AMM)
Component Maintenance Manuals (CMM)
Service Bulletins (SB)

AECMA 1000D

Data Modules

ISO 8632

Computer Graphic Metafiles

AECMA SE

Simplified English

Electronic Delivery

Text
Grafik

3. Aktuelle Programme ATA iSpec 2200 / AECMA 1000D

Programm	Technische Dokumentation	Datum
Eurofighter	Data Module	2000
Airbus A340-500	CMM, SB	2001
Embraer ERJ 170	AMM, CMM, SB	2001
Bombardier BD 100	AMM, CMM, SB	2001
Airbus A380	ATA iSpec 2200	2004

4. Ausgangssituation

4.1 Lebenszyklus von Verkehrsflugzeugen

Erste Idee bis Serienbasisflugzeug	10 Jahre
Weiterentwicklung und Serienbetreuung	20 Jahre
Änderungen, Umrüstungen, Reparatlösungen bis zur Außerdienststellung	20 Jahre

somit:

Kundendienst (Wartungskonzepte, Handbücher)	50 Jahre
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4. Ausgangssituation

4.2 Unsere Dokumentationswerkzeuge

Datum	Werkzeug	P	S	Merkmale
	Schreibmaschine			manuell
1984	Textautomat	x		Hard- und Software
1988	DOS Word 5, Wordstar, Wordperfect	x x	x	Hardware Textverarbeitung
1991	UNIX, Personal Computer X11, MS Windows FrameMaker Ventura Publisher E-Mail, Internet	 x x	x x x	Hardware Graphische Oberfläche Desktop Publishing Elektronischer Datenaustausch
2000	Neue Technologien SGML ISO 8879 CGM ISO 8632		 x x	Unabhängig von Hard- und Software Langzeitstabilität

P = proprietary S = standard

5. Umstellungsprozess

SGML Workgroup

stefan.bulling@lli.liebherr.com

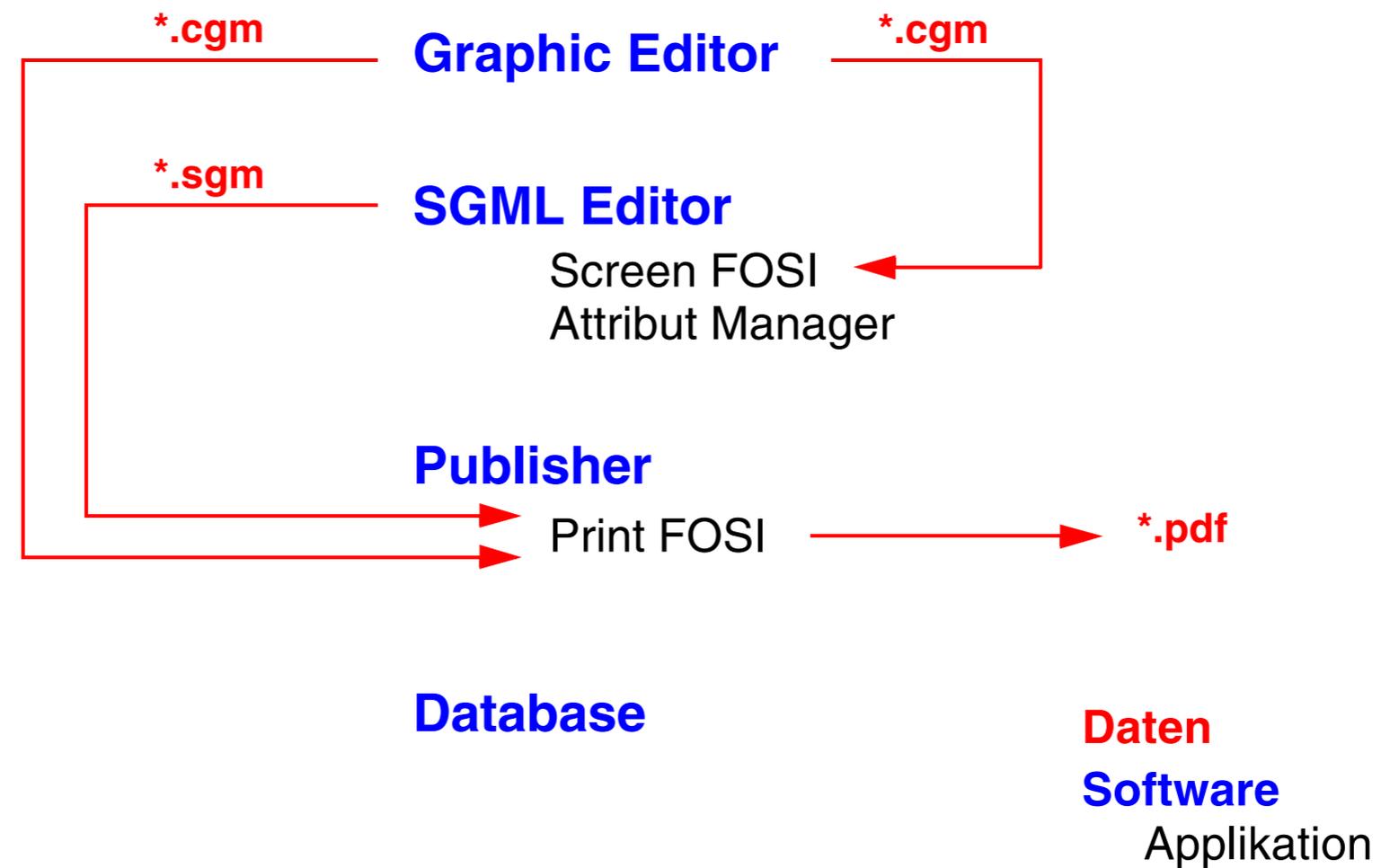
lahouari.mbarek@lts.liebherr.com

Kriterien

- Fortführung vorhandener Erstellungsprozesse
- Einheitliche Software für alle Standorte
- Ein Basiswerkzeug für alle Aufgaben
- Kompatibilität zu Kunden
- Standard Software inkl. Applikation
- Vermeidung von Individual-Programmierung
- Einfaches Outsourcing
- Preis

6. Auswahl der Komponenten

6.1 Übersicht



6. Auswahl der Komponenten

6.2 Funktions-Matrix

Komponente	AECMA 1000D	ATA AMM	ATA CMM	ATA SB
Editor	*	*	*	*
Screen FOSI	(1)	(1)	*	*
Attribut Manager	(1)	(1)	*	*
Publisher			*	*
Print FOSI			*	*
Database	(2)	(2)	(3)	(3)

(1) supplied by A/C manufacturer

(2) server @ A/C manufacturer; client @ supplier

(3) optional, planned

6. Auswahl der Komponenten

6.3 Entscheidungen Standardsoftware

1. SGML Editor	Epic	+ native SGML Editor - keine Layoutkontrolle - kein WYSIWYG
	FrameMaker+SGML	+ DTP Software - Buchstruktur - Export to SGML
2. Publisher	Online Epic, FM+SGML	+ integrierte Lösung
	Offline 3B2, Xyvision, ADOC	- Zwei Softwareprodukte - Schnittstellen-Probleme

Erforderliche Applikation: **Screen- & Print-FOSI CMM/SB for Epic**

7. Lösung Liebherr-Aerospace

7.1 Produktübersicht

Arbortext www.arbortext.com

Epic 4.1 Editor

Piper Group PLC www.piper-group.com

ATA iSpec 2200 Application V1.4

- CMM Screen- & Print-FOSI
- SB Screen- & Print-FOSI
- Attribut Manager
- Utilities

Arbortext

Epic 4.1 Publisher AddOn

Adobe www.adobe.com

Acrobat 4.0

Itedo www.itedo.com

Isodraw 5.03

7. Lösung Liebherr-Aerospace

7.2 Anwendungsbeispiele (CMM - Screen FOSI)

The screenshot displays the Epic Editor interface for a CMM (Coordinate Measuring Machine) application. The left pane shows a hierarchical tree structure of the document, and the right pane shows the rendered screen FOSI (Formal Operator Screen Interface).

Tree View Structure:

- topic
 - title — D. Procedure
 - note — NOTE:
 - para — Do all procedures on a clean work surface to prevent contamination to the parts.
 - note
 - subtask — Subtask 32-31-0
 - title — (1) Visual Check
 - prclist1
 - prcitem1
 - prcitem
 - para — (a) Examine the actuator for damage and general condition.
 - prcitem
 - prcitem1
 - prcitem1
 - prcitem
 - para — (b) Carry out a surface inspection for noticeable damage, corrosion, scratches or contaminated spots.
 - prcitem
 - prcitem1
 - subtask
 - title — (2) Dimensional Inspection
 - prclist1
 - prcitem1
 - prcitem
 - para — (a) Set the actuator in the fully retracted position, verify if the distance, between the centers of bearings, is 230.9 mm (9.09 in).
 - prcitem
 - prcitem1
 - prcitem1
 - prcitem
 - para — (b) Set the actuator in the fully extended position, verify if the distance, between the centers of bearings, is from 332.0 mm to 336.0 mm (13.07 in to 13.22 in).
 - prcitem
 - prcitem1

Rendered Screen FOSI Content:

D. Procedure

NOTE: Do all procedures on a clean work surface to prevent contamination to the parts.

Subtask 32-31-05-210-001-A01

(1) Visual Check

(a) Examine the actuator for damage and general condition.

(b) Carry out a surface inspection for noticeable damage, corrosion, scratches or contaminated spots.

Subtask 32-31-05-220-001-A01

(2) Dimensional Inspection

(a) Set the actuator in the fully retracted position, verify if the distance, between the centers of bearings, is 230.9 mm (9.09 in).

(b) Set the actuator in the fully extended position, verify if the distance, between the centers of bearings, is from 332.0 mm to 336.0 mm (13.07 in to 13.22 in).

Subtask 32-31-05-700-001-A01

(3) Weight Check

(a) Weigh the actuator with the balance.

(b) Make sure that the maximum weight of the actuator is 0.566 kg (1.247 lb), dry and without storage plugs.

Subtask 32-31-05-750-001-A01

(4) Electrical Test – Earth Continuity
(Ref. Fig. 1001)(Ref. Fig. GRAPHIC-32-31-05-99B-014-A-01-14)

Command: [fmt-needed] [EXT] [READ] [INC]

7. Lösung Liebherr-Aerospace

7.2 Anwendungsbeispiele (CMM - Print Preview)

The image displays two overlapping windows from the Epic Editor software. The left window, titled 'Epic Editor - lb170cmm32-31-05.sgm', shows a hierarchical tree view of a document structure. The right window, titled 'Print Preview - C:\TEMP\apc\cache\aea00195\aea00195', shows a preview of the document's content, including a scale bar and various technical instructions.

Epic Editor Tree View:

- topic
 - title D. Procedure
 - note NOTE
 - para Do all procedures on a clean work surface to prevent contamination to the parts.
 - note
 - subtask Subtask 32-31-0
 - title (1) Visual Check
 - prclist1
 - prcitem1
 - para (a) Examine the actuator for damage and general condition.
 - prcitem1
 - para (b) Carry out a surface inspection for noticeable damage, corrosion, and contaminated spots.
 - subtask Subtask 32-31-0
 - title (2) Dimensional Inspection
 - prclist1
 - prcitem1
 - para (a) Set the actuator in the fully retracted position, verify if the distance between the centers of bearings, is 230.9 mm (9.09 in).
 - prcitem1
 - para (b) Set the actuator in the fully extended position, verify if the distance between the centers of bearings, is from 332.0 mm to 336.0 mm (13.07 in to 13.22 in).
 - subtask Subtask 32-31-0
 - title (3) Weight Check
 - prclist1
 - prcitem1
 - para (a) Weigh the actuator with the balance.
 - prcitem1
 - para (b) Make sure that the maximum weight of the actuator is 0.566 kg (1.247 lb), dry and without storage plugs.
 - subtask Subtask 32-31-0
 - title (4) Electrical Test - Earth Continuity (Ref. Fig. 1001)(Ref. Fig. GRAPHIC-32-31-05-99B-014-A-01-14)
 - prclist1
 - prcitem1
 - para (a) Set the electrical resistance between points X1 and X2 is not more than 10 milliohms.

Print Preview Content:

LIEBHERR **ELEB**
COMPONENT MAINTENANCE MANUAL
170-1100-401

C. Job Setup

WARNING: HYDRAULIC FLUID IS TOXIC TO SKIN, EYES AND RESPIRATORY TRACT. USE SKIN AND EYE PROTECTION. AVOID REPEATED OR PROLONGED CONTACT. USE ONLY IN WELL VENTILATED AREAS. IF IT TOUCHES YOUR SKIN, FLUSH WITH WATER. IF IT GETS IN YOUR EYE, FLUSH WITH WATER AND LOOK FOR MEDICAL HELP.

CAUTION: THIS ACTUATOR IS USED WITH HYDRAULIC FLUID (PHOSPHATE ESTER). IT IS NOT COMPATIBLE WITH OTHER TYPES OF FLUID. THE FLUID WILL ATTACK A WIDE RANGE OF MATERIALS, WHICH INCLUDE TITANIUM, RUBBER, COPPER, SOME PLASTICS, AND PAINTS.

Subtask 32-31-05-020-001-4-01
(1) Removal of the Storage Plug and Hydraulic Fluid

(a) Remove the storage plug and hydraulic fluid from the MLG Downrod Release Actuator.

D. Procedure

NOTE: Do all procedure on a clean work surface to prevent contamination to the parts.

Subtask 32-31-05-210-001-4-01
(1) Visual Check

(a) Examine the actuator for damage and general condition.

(b) Carry out a surface inspection for noticeable damage, corrosion, and contaminated spots.

Subtask 32-31-05-220-001-4-01
(2) Dimensional Inspection

(a) Set the actuator in the fully retracted position, verify if the distance between the centers of bearings, is 230.9 mm (9.09 in).

(b) Set the actuator in the fully extended position, verify if the distance between the centers of bearings, is from 332.0 mm to 336.0 mm (13.07 in to 13.22 in).

Subtask 32-31-05-700-001-4-01
(3) Weight Check

(a) Weigh the actuator with the balance.

(b) Make sure that the maximum weight of the actuator is 0.566 kg (1.247 lb), dry and without storage plugs.

Subtask 32-31-05-750-001-4-01
(4) Electrical Test - Earth Continuity (Ref. Fig. 1001)

(a) Check that the electrical resistance between points X1 and X2 is not more than 10 milliohms.

32-31-05 Page 1002
Mar 01/02

'visual check' found on page 31 [refmt-needed] Page 26 of 84 1-Up EXT

7. Lösung Liebherr-Aerospace

7.2 Anwendungsbeispiele (SB - Screen FOSI)

The screenshot displays the Epic Editor interface with a document structure on the left and a rendered screen FOSI on the right. The document title is "PNEUMATIC - ENGINE BLEED AIR SUPPLY SYSTEM - HIGH PRESSURE REGULATING VALVE PNR 6713D070000 - BLEED IMPROVEMENT PROGRAM MODIFICATION". The rendered content includes sections for Planning Information, Effectivity, Concurrent Requirements, and Reason.

Document Structure (Left Panel):

- plansect
 - title — A. Effectivity
 - list1
 - l1item
 - para — (1) Equip
 - para — High Pre
 - oldpnr — PNR
 - para
 - l1item
 - list1
 - plansect
 - plansect
 - title — B. Concurrent R
 - para — Not applicable.
 - plansect
 - title — C. Reason
 - para — Liebherr-Aeros
 - para — The A320 High
 - unlist
 - unlitem
 - para — Butterfl
 - unlitem
 - unlitem
 - para — Bearin

Rendered Content (Right Panel):

STANDARD

PNEUMATIC - ENGINE BLEED AIR SUPPLY SYSTEM - HIGH PRESSURE REGULATING VALVE PNR 6713D070000 - BLEED IMPROVEMENT PROGRAM MODIFICATION

1. Planning Information

A. Effectivity

(1) Equipment Involved

High Pressure Regulating Valve PNR 6713D070000.

B. Concurrent Requirements

Not applicable.

C. Reason

Liebherr-Aerospace Toulouse and Airbus initiated a Bleed Improvement Program in order to achieve a significant improvement in the long term reliability of the Bleed System components. Refer to Liebherr-Aerospace Toulouse SIL LSF 1958-07 for further details.

The A320 High Pressure Regulating Valve, in the frame of the Bleed Improvement Program, benefits of design and maintainability improvements on the following sub-assemblies:

- Butterfly Segmentation : Stapled double flat ring in cobalt alloy (Alacrite), radial expander, butterfly changed by new butterfly in stainless steel (EZ6) with no coating.
- Bearings: New concept deep groove ceramic balls on stainless steel races, spring preloaded.

7. Lösung Liebherr-Aerospace

7.2 Anwendungsbeispiele (AMM - Embraer ERJ170)

Epic Editor - Document1

File Edit Find View Insert Entities Table Tools EMBTools Options Format Window Help

task Removal/Installation - TA

- comment EDWG: 170-xxxxx-xc
- comment TREP: 170ICD0146-
- comment TREP: 170ICD0113-
- effect
- title *This title will be extractec*
- tfmatr
 - pretopic
 - title A. General
 - list1
 - l1item (1)
 - para This task giv
 - l1item
 - l1item (2)
 - para This task ca
 - l1item
 - list1
 - para *-- NEXT PRETOPICS WILL BE C*
 - pretopic
 - tfmatr
 - topic B.
 - title Forward Service-Door
 - grphcref (Figure ref-00
 - subtask Subtask: 25-23
 - effect
 - comment The informatk

Removal/Installation - TASK 25-23-10-000-801-A/401
EDWG: 170-xxxxx-xxx-RevX
TREP: 170ICD0146-Rev.N/A
TREP: 170ICD0113-Rev.N/A

This title will be extracted from Bookplan **title**

A. General

- (1) This task gives the procedure to remove the forward service-door trim shroud.
- (2) This task can be accomplished without the need of any job set-up on the aircraft.

-- NEXT PRETOPICS WILL BE GENERATED AUTOMATICALLY BY THE PRINTING PROCESS. --

B. Forward Service-Door Trim Shroud Assembly - Removal **grphcref**
grphcref (Figure ref-0001277-gra-5)

Subtask: 25-23-10-000-020-A

The information to prepare this template is based on ERJ-145. This component on ERJ-170 ⇒ is different. The illustration used to prepare this template, is the Sample 3 - Illustration - Effect⇒ ivity (170-CSR-0014).

- (1) Remove the sealant from around the base of the door forward corner (3 Fig. em170mpp250208) **grphcref** and the base of the door aft corner (17 Fig. em170mpp250208) **grphcref** (SRM PART 2 51-21-00/1 - Sealing).

Command:
[A11180] No completeness errors found (entities included) [fmt-needed] EXT MOD INC

7. Lösung Liebherr-Aerospace

7.3 Kostenbeispiel (4 Autoren)

Epic 4.x Editor 4 x 695 EUR

Piper iSpec2200 CMM&SB 12.000 EUR

Epic Publisher AddOn 2.400 EUR

Software pro Arbeitsplatz ca. 4.300 EUR

+ Hardware (PC, WinNT)

+ Software-Wartung

+ ATA-Know-how

+ Schulung

+ Support

8. Probleme

ATA iSpec 2200

- Online Dokument (ca. 4500 Seiten)
- Struktur
- Flexibilität
- Details
- Beispiele

Lösungen

Style Guide
Beispiel-Dokumente

CGM is not CGM

Datenaustausch spezifizieren
Software-Updates

Papier-Layout <==> SGML-Information

Entscheidungen »best guess«

Publishing Prozess

- Komplexer Formatierungs-Vorgang
- Formatierung nach festgelegten Regeln
- Benutzer kann Regeln nicht beeinflussen
- Applikations-Updates notwendig

Kritische Applikations-Auswahl
Testdaten
Autoren-Regeln spezifizieren

9. Erfahrungen

Stabilität

Funktionalität

Akzeptanz

10. Wie gehts weiter?

LIEBHERR CMM/SB Style Guide

Detaillierte Kommentare der Kunden

Integration weiterer Anwender-Anforderungen

Schnittstelle Stückliste - Detailed Parts List

Software unterstütztes AECMA Simplified English

Datenverwaltung