

ATA SPEC2000 Chapter 16. Electronic Product and Part Regulatory Documentation

Implementation of Spec 2000 Digital release certificates (8130-3, EASA Form1,...)

Werner Magerl, warp it AG

ATA Forum 2025, Montreal



Speaker

- Werner Magerl
- Director of SAP projects at warp it in Germany
- 25 years of experience in Aerospace & Defence business

Company Facts – warp it AG

- warp it AG was founded in 2000 as a consulting company for Aerospace and Defense
- Over 15 years of experience in logistic processes
- Specialist in ATA SPEC2000 and ASD S2000M specifications
 - consulting chapter 1-4 as well as other chapters
 - co-operation with ATA working groups
 - ATA e-Business Forum participation
- Specialized in e-Business processes in A&D
- Specialized in integration of SPEC2000 into SAP ERP landscape
- Certified SAP Build Partner „Powered by Netweaver“ since 2005



Agenda

- AS IS situation
- Details of Chapter 16
- 3 security aspects
- XML vs. Human
- Summary + Q&A

AS IS situation

- Past

- Paper
- Paper
- More paper ...

- Today

- Paper, Paper,
- PDF (printed, mostly scanned)
- More Paper+PDF ...



Paper Reality – valid or fake?

1. Approving National Aviation Authority/Country: FAA/United States		2. AUTHORIZED RELEASE CERTIFICATE FAA Form 8130-3, AIRWORTHINESS APPROVAL TAG			3. Form Tracking Number 075631258	
4. Organization Name and Address: PRATT & WHITNEY 415 WASHINGTON AVENUE NORTH HAVEN, CT 06473, USA					5. Work Order/Contract/ Invoice Number 90984346	
4. Organization Name and Address: TURBINE AIRFOILS PRODUCT CENTER FAA APPROVAL HOLDER PRODUCTION CERTIFICATE NUMBER 2						
6. Item	7. Description	8. Part Number	9. Eligibility	10. Quantity	11. Serial/Batch Number	12. Status/Work
1	BLADE	54L732	PW4000	140	N/A	NEW
13. Remarks: Page 1 of 1 ORIGINAL AIRWORTHINESS APPROVAL						
14. Certifies the items identified above were manufactured in conformity to: <input type="checkbox"/> Approved design data and are in a condition for safe operation <input type="checkbox"/> Nonapproved design data specified in Block 13			19. <input type="checkbox"/> 14 CFR 43.9 Return to Service <input type="checkbox"/> Other requisition specified in Block 13 Certifies that unless otherwise specified in Block 13, the work identified in Block 12 and described in Block 13 was accomplished in accordance with Title 14, Code of Federal Regulations, part 43 and in respect to that work, the items are approved for return to service.			
15. Authorized Signature: <i>Lorrey K. Hatch</i>		16. Approval/Authorization No.: NE00004AC		20. Authorized Signature:		21. Approval/Certificate No.:
17. Name (Typed or Printed): LORREY HATCH		18. Date (m/d/y): 1/24/2004		22. Name (Typed or Printed):		23. Date (m/d/y):
User/Installer Responsibilities						
<p>It is important to understand that the existence of this document alone does not automatically constitute authority to install the part/component/assembly.</p> <p>Where the user/installer performs work in accordance with the national regulations of an airworthiness authority different than the airworthiness authority of the country specified in Block 1, it is essential that the user/installer ensures his/her airworthiness authority accepts parts/components/assemblies from the airworthiness authority of the country specified in Block 1.</p> <p>Statements in Blocks 14 and 18 do not constitute installation certification. In all cases, aircraft maintenance records must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft is flown.</p>						

FAA Form 8130-3 (8-01)

*Installer must cross-check eligibility with applicable technical data.

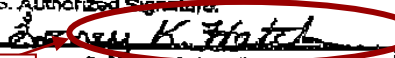
NSN: 0052-00-012-8005

Paper Reality – fake!

North Haven Facility closed in 2003

Description not consistent with other 8130-3 tags for this part number

Mr. Hatch retired on 3-31-99

Approving National Aviation Authority/Country: FAA/United States		AUTHORIZED RELEASE CERTIFICATE FAA Form 8130-3, AIRWORTHINESS APPROVAL TAG			Form Tracking Number 075631258	
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		TURBINE AIRFOILS PRODUCT CENTER FAA APPROVAL HOLDER PRODUCTION CERTIFICATE NUMBER 2				
6. Item	7. Description	8. Part Number	9. Eligibility	10. Quantity	11. Serial/Batch Number	12. Status/Work
1	BLADE	54L732	PW4000	140	N/A	NEW
13. Remarks: Page 1 of 1 ORIGINAL AIRWORTHINESS APPROVAL						
14. Certifies the items identified above were manufactured in conformity to: <input type="checkbox"/> Approved design data and are in a condition for safe operation <input checked="" type="checkbox"/> Nonapproved design data specified in Block 13			19. <input checked="" type="checkbox"/> 14 CFR 43.9 Return to Service <input type="checkbox"/> Other requisition specified in Block 13 Certifies that unless otherwise specified in Block 13, the work identified in Block 12 and described in Block 13 was accomplished in accordance with Title 14, Code of Federal Regulations, part 43 and in respect to that work, the items are approved for return to service.			
15. Authorized Signature: 		16. Approval/Autorization No.: NEB00004AC		20. Authorized Signature:		21. Approval/Certificate No.:
Name (Typed or Printed): LORREY HATCH		18. Date (m/d/y): 1/24/2004		22. Name (Typed or Printed):		23. Date (m/d/y):
User/Installer Responsibilities Important to understand that the existence of this document alone does not automatically constitute authority to install the part/component/assembly. The user/installer performs work in accordance with the national regulations of an airworthiness authority different than the airworthiness authority of the country specified in Block 1. It is essential that the user/installer ensures his/her airworthiness authority accepts parts/components/assemblies from the airworthiness authority of the country specified in Block 1. Statements in Blocks 14 and 19 do not constitute installation certification. In all cases, aircraft maintenance records must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft is flown.						

Obsolete ODAR number not used since 7-31-98

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- AS IS situation
- Details of Chapter 16
- 3 security aspects
- XML vs. Human
- Summary + Q&A

ATA SPEC2000 Chapter 16

This chapter provides a standardized set of data formats and implementation guidelines for the electronic exchange of regulatory documentation for aircraft products and parts.

What is Chapter 16?

- ❑ A replacement of paper forms with digital forms
- ❑ A common electronic data format
- ❑ A “data-centric” approach
- ❑ A comprehensive baseline of data security capabilities
- ❑ A shared process for exchanging data
- ❑ A set of agreed implementation rules
- ❑ An international, open, broad-based industry standard

Common digital format for:

- ❑ Regulatory Forms (ARCs)
 - CAA Form 1 (UK, copy of EASA Form 1)
 - CASA Form 1 (previous CASA Form 917)
 - EASA Form 1 (previous JAA Form One)
 - FAA Form 8130-3
 - TCCA Form One (previous TCCA 24-0078)

- ❑ None Regulatory Forms
 - ATA Form 106
 - Certificate of Conformance (US version)
 - Certificate of Conformity (EU version)
 - Transfer Document (new for XML, see later)

Guiding Principles in CH 16

- ❑ Standard pertains to exchange of data, not internal company processes
- ❑ Meet intent and objectives of governing regulations
- ❑ Leverage regulatory guidance regarding digital signature
- ❑ Meet legal and liability requirements
- ❑ Leverage existing technologies, standards, and best practices where applicable

Business Guidelines

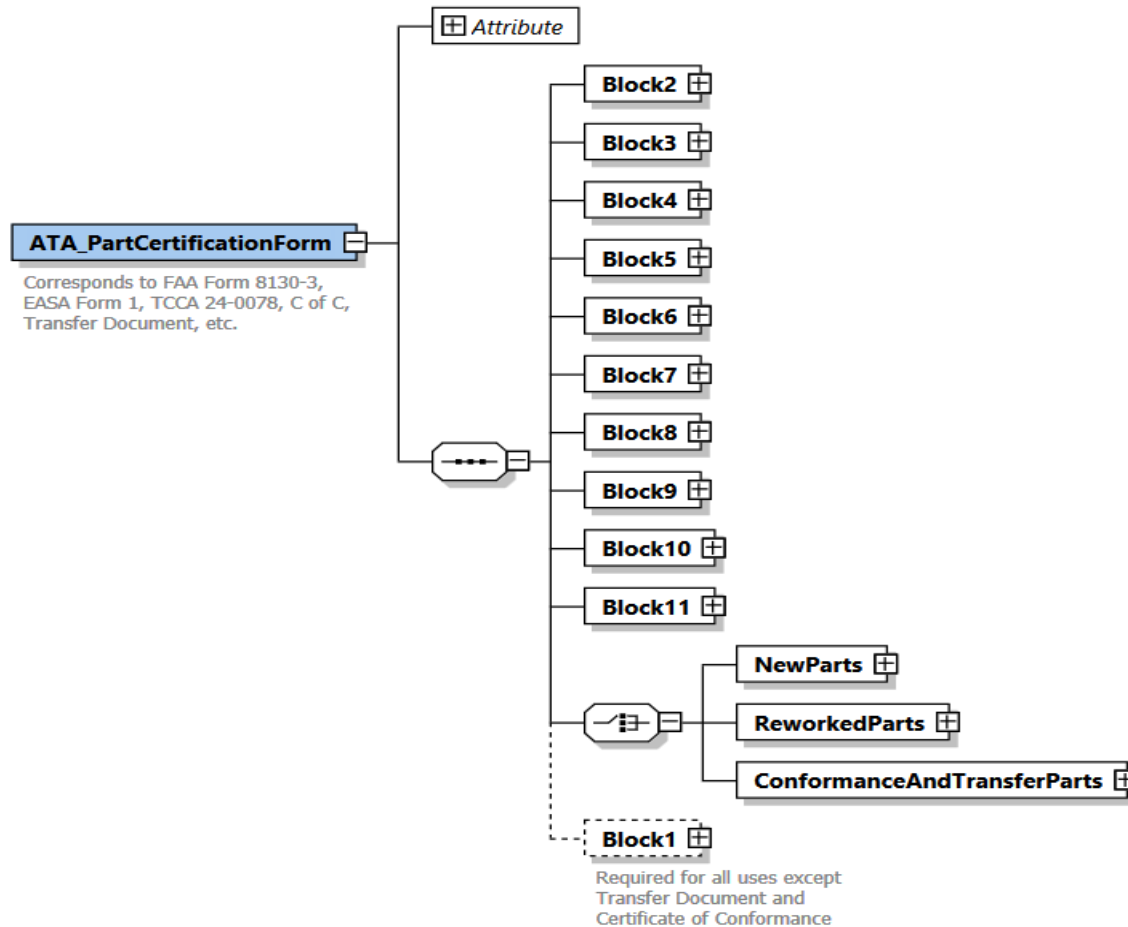
- ❑ A new digital form will be issued for each transfer
- ❑ A separate digital form will be issued for each part number for non-serialized parts
- ❑ A separate digital form will be issued for each serial number for serialized parts
- ❑ Each digital form should reference and attach any applicable and preceding digital form
- ❑ All transmissions of an unaltered and signed digital form are considered originals
- ❑ Any paper forms printed from the digital form are considered copies.

Development XML schema

- ATA_PartCertificationForm XML
 - The data elements that are provided
 - Which are mandatory/optional, repeatable
 - The sequence in which they're provided
 - The application of digital signatures to the data
 - References to previous digital form

Development XML schema

■ ATA_PartCertificationForm

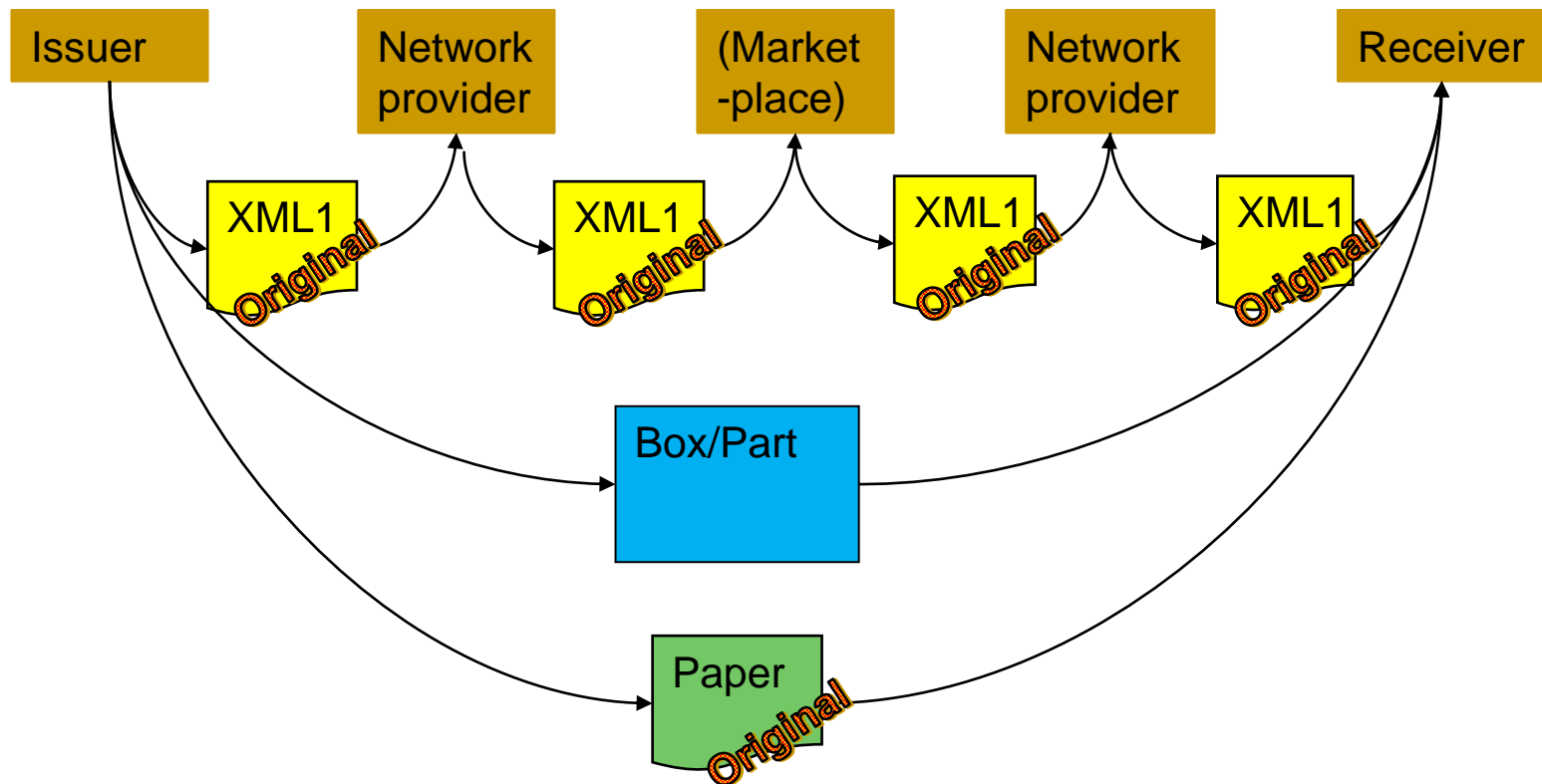


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Transaction Security

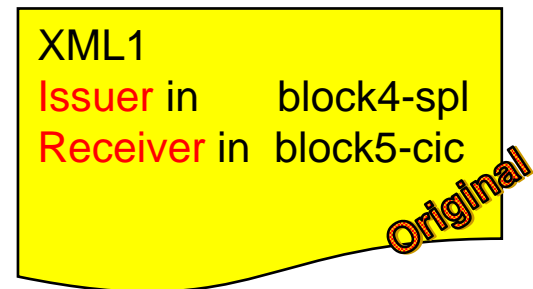
- A transmissions of an unaltered and digitally signed digital form are considered as original!



Transaction Security

Enhancements to Regulatory Orders

- Block 4
 - (N)CAGE code of issuing company to generate a worldwide unique key with the TDN
- Block 5
 - Customer Identification Code (CIC)
 - Customer Order Number (CPO)
- Block 8
 - Added MFR to establish MFR:PNR combination to unambiguously identify part
- Block 9
 - Added Unit of Measure to Quantity



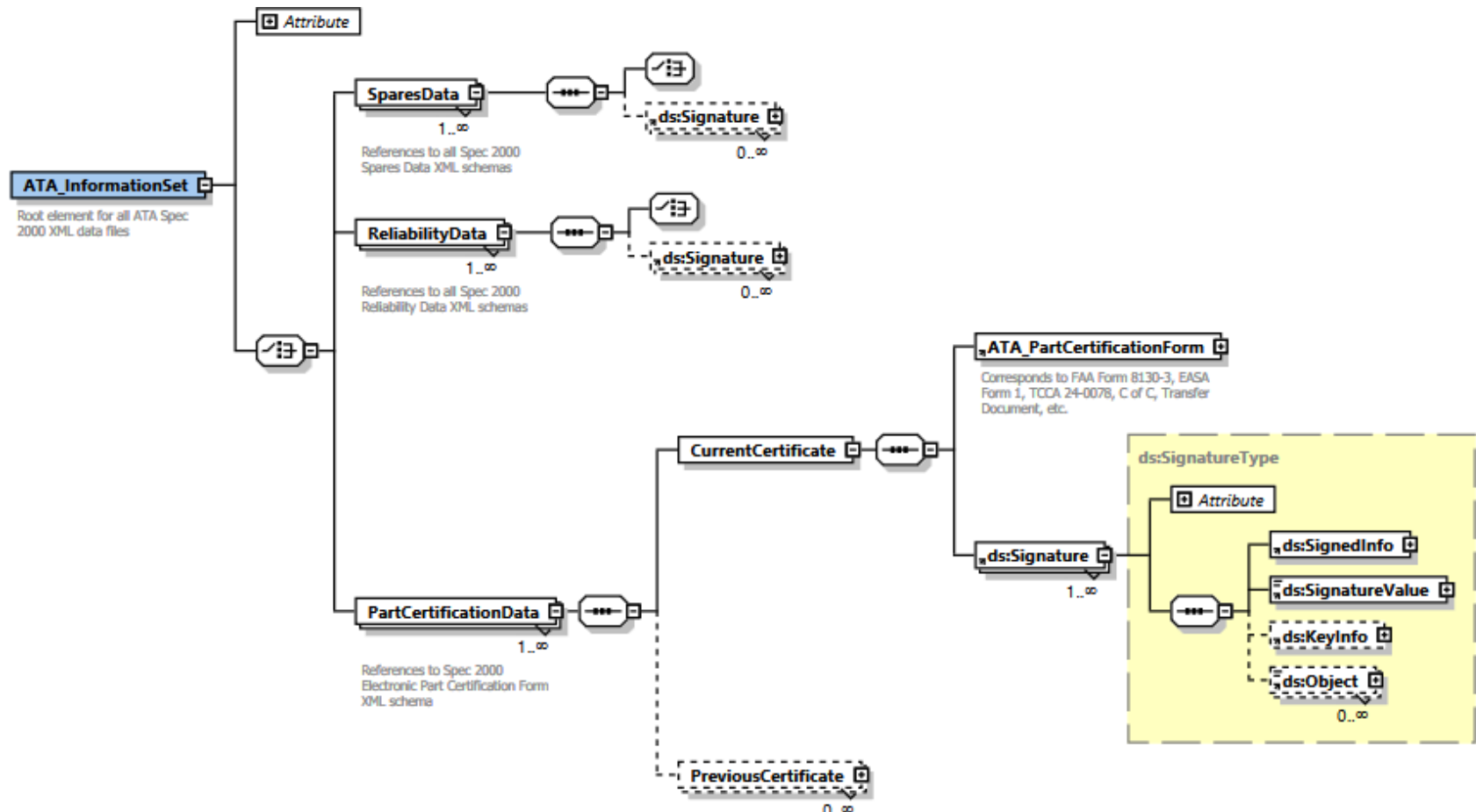
Digital Security - Overview

- Objectives
 - Data integrity
 - Non-repudiation
 - Signer authentication

- Solution
 - Digital Signatures
 - Standard W3C XML signature
 - X.509 Digital Certificates
 - Public Key Infrastructure (PKI)

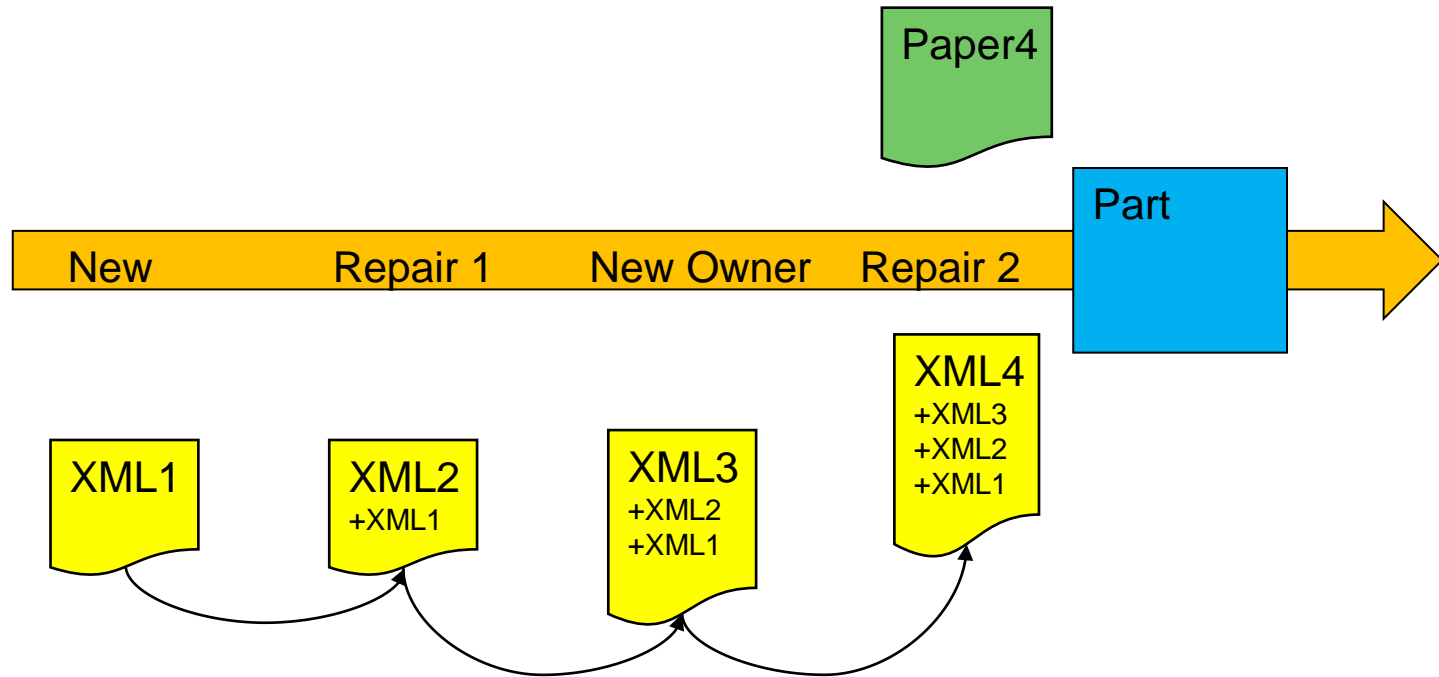
Digital Security – XML integration

■ ATA_InformationSet with „ds:Signature“ tag



Life-time security

- Each digital form should reference and attach any applicable and preceding digital form

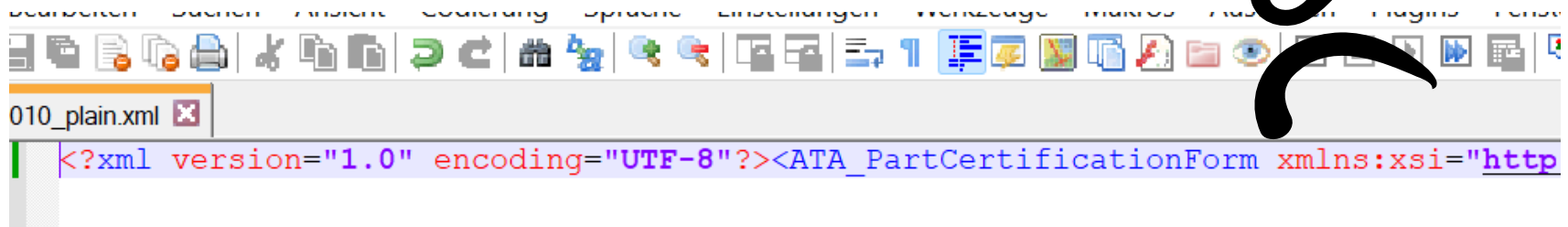


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XML vs. Human

■ XML linearized




■ XML in simple editor

A screenshot of a simple XML editor window titled 'Datei Bearbeiten Ansicht'. The editor shows a structured XML document for an ATA Part Certification Form. The XML is formatted with indentation to show the hierarchy of elements. The content includes fields for FVI, EASA Form 1, TDN, IssuerDetail, ZIP, CNT, PCH, CPO, LIN, PDT, MFR, PNR, QTY, SER, PSC, NewParts, and REM.

```
<?xml version="1.0" encoding="UTF-8"?><ATA_PartCertificationForm
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="ATA_PartCertificationForm.xsd" version="2.0" id="ID000010"><Block2>
<CET FVI="xx-07">EASA Form 1</CET></Block2><Block3><TDN>1104040608</TDN></Block3><Block4>
<IssuerDetail><SPL>D9999</SPL><WHO>warp it AG</WHO><ADL>Ahornweg 5</ADL><CIY>Pleiskirchen</CIY>
<ZIP>84568</ZIP><CNT>DE</CNT><PCH>WARP 777</PCH></IssuerDetail></Block4><Block5><CIC>XYZ</CIC>
<CPO>TS4567</CPO></Block5><Block6><LIN>1</LIN></Block6><Block7><PDT>Bearing</PDT></Block7><Block8>
<MFR>D9999</MFR><PNR>16-44784-1ABC</PNR></Block8><Block9><QTY UNT="EA">100</QTY></Block9><Block10>
<SER>67867866</SER></Block10><Block11><PSC>NEW</PSC></Block11><NewParts><Block13a><DDA>A</DDA>
</Block13a><Block13c><ARN>WARP54123SW</ARN></Block13c><Block13d><NME>A. Inspector</NME></Block13d>
<Block13e><DAT>2025-09-08</DAT></Block13e><Block12N><REM>Test Remarks</REM></Block12N></NewParts>
<Block1><NAA>EASA</NAA></Block1></ATA_PartCertificationForm>
```

XML vs. Human

■ XML with Pretty Print



```
<?xml version="1.0" encoding="UTF-8"?>
<ATA_PartCertificationForm xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:noNamespaceSchemaLocation="ATA_PartCertification.xsd"
    version="2.0"
    id="ID000010">

  <Block2>
    <CET FVI="xx-07">EASA Form 1</CET>
  </Block2>
  <Block3>
    <TDN>1104040608</TDN>
  </Block3>
  <Block4>
    <IssuerDetail>
      <SPL>D9999</SPL>
      <WHO>warp it AG</WHO>
      <ADL>Ahornweg 5</ADL>
      <CIY>Pleiskirchen</CIY>
      <ZIP>84568</ZIP>
      <CNT>DE</CNT>
      <PCH>WARP 777</PCH>
    </IssuerDetail>
  </Block4>
  <Block5>
    <CIC>XYZ</CIC>
    <CPO>Ts4567</CPO>
  </Block5>
  <Block6>
    <LIN>1</LIN>
  </Block6>
  <Block7>
    <PDT>Bearing</PDT>
  </Block7>
</ATA_PartCertificationForm>
```

XML rendering

- Users need to see XML in a human readable way in a known format
 - Parallel processes with paper and digital
 - Minor deviations in guidelines of different authorities
-
- Using JAVA rendering or self developed solution
 - XML to screen (HTML, mobile device, AI glasses,...)
 - XML to PDF

XML rendering

1. Approving Competent Authority/Country		AUTHORISED RELEASE CERTIFICATE EASA FORM 1				3. Form Tracking Number	
EASA						1104040608	
4. Organisation Name and Address						5. Work Order / Contract / Invoice	
D9999 warp it AG Ahornweg 5 Kirchen, 84568 GERMANY Production Certificate Holder: WARP 777						Customer: XYZ Order: 134567 Ship Advise: 777777 BOX: 8444555 Contract: CCCC123456	
6. Item No.	7. Description	8. Part No.	9. Quantity	10. Serial/Batch No.	11. Status/Work		
1	Handheld console	16-44784-1ABCDE	100 EA	67867866	INSPECTED/TESTED		
12. Remarks							
AA Batteries are NOT included!							
DMF: 2025-01-15 EXP: 2028-01-14 Previous Certificate: EASA Form 1 - D9999 - 11000022001 DRAWING: WIP47-23 REV 01 DATED 2024-07-01.							
13a. Certifies that the items identified above were New in conformity to:			14a. <input type="checkbox"/> Part-145.A.50 Release to Service <input type="checkbox"/> Other regulation specified in block 12.				
<input checked="" type="checkbox"/> approved design data and are in a condition for safe operation. <input type="checkbox"/> non-approved design data specified in block 12.			Certifies that unless otherwise specified in block 12, the work identified in block 11 and described in block 12, was accomplished in accordance with Part-145 and in respect to that work the items are considered ready for release to service.				
13b. Authorised Signature		13c. Approval /Authorisation Number		14b. Authorised Signature		14c. Certificate/Approval Ref. No.	
Digital Signature on File		WARP54123SW					
13d. Name		13e. Date (dd/mmm/yyyy)		14d. Name		14e. Date (dd/mmm/yyyy)	
W. Magerl		17/SEP/2025					
User/Installer Responsibilities							
This certificate does not automatically constitute authority to install.							
Where working in accordance with the national regulations of an Airworthiness Authority different than the Airworthiness Authority of the country specified in block 1, the user/installer shall ensure that their Airworthiness Authority accepts items from the Airworthiness Authority of the country specified in block 1.							
Statements in block(s) 13a and 14a do not constitute installation certification. In all cases aircraft maintenance records must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.							

... additional fields

... naming and formatting

... only as reference

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Summary



Using Chapter 16 is

- ❑ in transmitting the data
- ❑ processing the data
- ❑ against manipulation and corruption
- ❑ identifying the signer
- ❑ reducing cost for paper handling

Lessons learned

- Individual digital signature certificate (X.509) to be used
- Enable digital signature environment before or at the start of the project
- Open enhancement in XML structure for TRIPLE RELEASE in repair process

Thank You!

Contact

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