

Navigating the Complexity of Converting Legacy Documents to S1000D Compliant Content



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Overview: Why S1000D Conversion is Complex

- Converting legacy documents (Word, PDF, InDesign) to S1000D is more than format migration.
- It requires deep structural, semantic, and workflow transformations:
 - Modularization of content
 - XML and metadata compliance
 - Integration with CSDB and BREX rules
 - Change management for authors and reviewers

1. Technical Structure Complexity

- Fragmenting larger document constructs such as Chapters and Sections into more granular structures – e.g. Data Modules (DMs)
- Ensuring XML schema compliance (PM, DM and other types)
- Converting and linking illustrations (to CGM/SVG)
- Rebuilding cross-references between DMs

2. Content Semantics and Interpretation

- Classifying legacy content into S1000D types
- Extracting required metadata (tools, ICNs, safety)
- Aligning terminology with project-specific vocabularies
- Tagging conditions, cautions, and reusables accurately

3. System Integration and Workflow

- Ingesting content into CSDB with metadata and history
- Ensuring BREX and business rule compliance
- Linking DMs to DMRL and publication structures
- Validating consistency across modules and systems

4. Organizational and Human Factors

- Retraining authors in XML and structured thinking
- Resistance to modular/document-free workflows
- Adjusting review and approval cycles for modular content
- Shifting from desktop tools to structured CMS platforms

Where is AI in S1000D Conversion Projects

AI Capability

How It's Used in S1000D Projects

Document Classification

Automatically assign content to correct DM types (PM, IPD, etc.)

Metadata Extraction

Identify titles, part numbers, conditions, etc. for DMC generation

Content Chunking

Break large documents into modular procedures or descriptions

Procedure Detection

Identify steps, warnings, and notes to build procedural modules

Terminology Normalization

Align terms with BREX/business rules

Graphics Matching

Match legacy illustrations to parts/procedures using vision models

Validation & QA

AI-based checks for schema errors, reuse conflicts, or rule breaches

5. Scalability and AI Limitations

- Converting 10,000+ pages of legacy content is resource-intensive
- AI tools help—but can't resolve procedural logic fully
- Need for human-in-the-loop validation
- Scaling automation across diverse content types is hard

Summary of Key S1000D Conversion Complexities

- Technical: Schema, structure, graphics, cross-references
- Semantic: Classification, metadata, terminology
- Integration: CSDB, BREX, DMRL, QA
- Organizational: Skills, processes, change resistance
- Scale: AI limitations, content volume, QA overhead

Challenges and Solutions

Challenge	Solution
Modularizing legacy documents	Use AI-assisted chunking tools to auto-detect procedures; define modularization rules.
Ensuring XML schema compliance	Use XML editors with built-in S1000D validation.
Graphics rework	Convert/redraw illustrations into CGM/SVG using tools.
Cross-reference repair	Use automated link detection scripts to replace free-text references with DMRefs.
Content classification	Apply AI/NLP models to classify content types with human QA.
Metadata extraction	Use rule-based NLP to pull tools, ICNs, and applicability.

Challenges and Solutions

Challenge	Solution
Terminology inconsistencies	Develop a controlled vocabulary and enforce via QA plugins.
Reusable content detection	Use fuzzy matching to find duplicates across legacy docs.
CSDB ingestion	Use batch API connectors to upload DMs with metadata.
BREX rule enforcement	Run pre-validation tools and visual BREX rule checkers.
DMRL linking	Automate DMRL generation from TOCs/spreadsheets.
Consistency QA	Use scripts to check ICNs, warnings, and reuse across modules.

Challenges and Solutions

Challenge	Solution
Skill gaps	Train authors on XML/S1000D via hands-on tools
Resistance to change	Start with pilot projects that show clear ROI.
Review workflow issues	Adopt modular review tools
Version control	Use CSDB-integrated XML editors with revision tracking.
Large content volume	Use AI pre-processing + SME review in semi-automated pipelines.
AI accuracy	Employ human-in-the-loop workflows for validation.

From our experience – Source

i. Remove torque collar seals (18) by pulling apart at joint and slipping end of seals through grooves in power unit.

j. Remove two power unit upper attach bolts (21), washers (20) and nuts (19).

k. Support power unit (22) and remove two lower attach bolts (21) and remove power unit (22) from strut.

3-65. Installation.

a. Position power unit on strut so strut lower attach lugs fit between lower lugs on power unit. Install two forward attach bolts (21).

b. Pull power unit away from strut slightly on aft side. Carefully slide upper and lower torque collar seals (18) through grooves until ends are a few inches from power unit and connect seals by pushing ends together.

c. Install lower aft attach bolt (25) and remove upper forward attach bolt (21).

NOTE

The laminated washer consists of laminations 0.003 inch thick and, when new, washer has a total thickness of 0.064 inch.

d. Align upper lugs and install laminated washers (20) between lugs. *Remove washer laminations, as required, to obtain snug fit at both upper lugs.*

NOTE

Install washers as required under nuts (19) after TO 1F-4-1096 has been complied with.

NOTE

If power unit is replaced, remove shipping plate and gasket from servo valve mounting surface on replacement power unit.

k. Install servo valve (8) on power unit per paragraph 3-66.

l. Install followup potentiometer (24) on power unit per paragraph 3-54.

m. Install O-ring (14), swivel (13), O-ring (12), one-way restrictor (11) and line (10) on power unit. Torque one-way restrictor (11) 40 to 65 inch-pounds. Safety with lockwire.

n. Install packing (5), swivel (4), packing (3), bolt (2) and pressure line (1) on power unit. Lockwire with MS20995NC32 wire.

o. Bleed aircraft utility hydraulic system. Refer to TO 1F-4E-2-6.

p. Perform system rigging per paragraph 3-44.

3-66. SERVO VALVE. See figure 3-13.

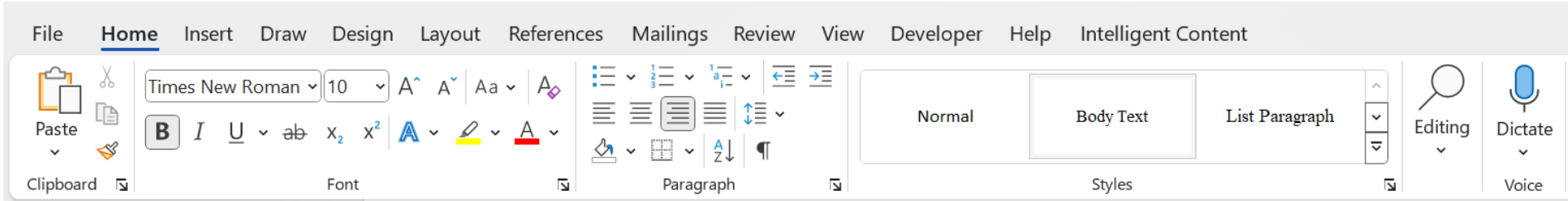
3-67. Tools and Equipment.

Wrench, torque, 0 to 50 inch-pounds

3-68. Materials.

Lockwire, MS20995NC20
Compound, silicone, MIL-S-8660B
Tape, lacing and tying dacron, nonslip treatment (for

Converted Word



The screenshot shows the Microsoft Word ribbon with the Home tab selected. The ribbon includes the following groups: Clipboard, Font (with options for Times New Roman, size 10, bold, italic, underline, and text color), Paragraph (with options for bullet points, numbering, and indentation), Styles (with options for Normal, Body Text, and List Paragraph), Editing (with a search icon), and Voice (with a dictation icon).

NOTE

If power unit is replaced, remove shipping plate and and gasket from servo valve mounting surface on replacement power unit.

k. Install servo valve (8) on power unit per paragraph 3-66.

l. Install followup potentiometer (24) on power unit per paragraph 3-54.

m. Install O-ring (14), swivel (13), O-ring (12), one- way restrictor (11) and line (10) on power unit. Torque one-way restrictor (11) 40 to 65 inch-pounds. Safety with lockwire.

n. Install O-ring (5), swivel (4), O-ring (3), bolt (2) and and pressure line (1) on power unit. Torque bolt (2) 40 to 65 inch-pounds.

o. Bleed aircraft utility hydraulic system. Refer to TO 1F-4E-2-6.

p. Perform system rigging per paragraph 3-44.

3-66. **SERVO VALVE.** See figure 3-13.

3-67. **Tools and Equipment.**

S1000D XML

```
</para>
  <note>
    <notePara>If power unit is replaced, remove shipping plate and and gasket from servo valve mounting surface on replacement power unit.</notePara>
  </note>
</proceduralStep>
<proceduralStep id="step11">
  <para>
    Install servo valve (8) on power unit per
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      </dmRefIdent>
    </dmRef>
  </para>
</proceduralStep>
<proceduralStep id="step12">
  <para>
    Install followup potentiometer (24) on power unit per
    <internalRef internalRefTargetType="irtt07">paragraph 3-54</internalRef>
  </para>
</proceduralStep>
<proceduralStep id="step13">
  <para>Install O-ring (14), swivel (13), O-ring (12), one way restrictor (11) and line (10) on power unit. Torque one-way restrictor (11) 40 to 65 inch-pounds. Safety with lockwire.
  </para>
</proceduralStep>
<proceduralStep id="step14">
  <para>Install O-ring (5), swivel (4), O-ring (3), bolt (2) and and pressure line (1) on power unit. Torque bolt (2) 40 to 65 inch-pounds.</para>
</proceduralStep>
<proceduralStep id="step15">
  <para>
    Bleed aircraft utility hydraulic system. Refer to
    <pmRef>
      <pmRefIdent>
        <pmCode modelIdentCode="1F" pmIssuer="0004E" pmNumber="00002" pmVolume="06"/>
      </pmRefIdent>
    </pmRef>
  </para>
</proceduralStep>
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Lessons Learned from Implementations

- Value of iterative prototyping.
- Importance of stakeholder education.
- Phased rollout strategies.
- Leveraging AI and natural language processing.
- Acknowledging the limits of automation.

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Thank You!

Feel free to reach out and connect