HELPING OEMS MEET THE CHALLENGE OF
S1000D ISSUE 4.2 COMPONENT MAINTENANCE PUBLICATIONS

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FLATIRONS® Turning Content into Knowledge®
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BACKGROUND

Large asset industries like aviation and defense have accelerated their adoption of S1000D in recent years, with a spate of new aircraft programs driving this growth. Recent moves by Airbus to migrate mature A3xx product families are only accelerating the S1000D adoption curve and creating new requirements for tech pubs teams everywhere.

While early S1000D efforts provided alternatives to iSpec 2200 Airframe Maintenance Manuals (AMMs) and Engine Maintenance Manuals (EMMs), recent initiatives have begun to address the needs of component manufacturers. With the adoption of the Component Maintenance Publication (CMP) nomenclature and supporting schema changes in 2017, the S1000D community has begun the process of supplanting the legacy iSpec 2200 Component Maintenance Manual (CMM). CMP brings with it the familiar benefits of S1000D – namely, increased flexibility and modularity as compared to the more monolithic nature of iSpec 2200 manuals.

The move toward CMP is not an academic one for component manufacturers. Both Boeing and Airbus are increasingly requiring component OEMs to submit data that is compliant with S1000D issue 4.2 as part of participating in programs like the 777X, the A350, and others. For manufacturers who want to evolve their technical publishing capabilities to meet these emerging program requirements to participate more readily in these programs and others, there are several business, technology, and process challenges to overcome.
As with any paradigm shift, the move to S1000D for component-level technical publications like issue 4.2 CMPs brings additional considerations, including:

1. **Compliance with the S1000D Issue 4.2 Specification:** The S1000D specification is powerful but complex. The S1000D issue 4.2 specification as published weights in at over 3,500 pages and includes dozens of schemas, templates, and samples to guide publishers toward the creation of compliant, portable content. Unfortunately, despite the best of intentions, many OEMs and service providers produce S1000D content that may be technically valid, but functionally inadequate for its intended use.

2. **Compliance with the ATA Civil Aviation Business Rules for S1000D issue 4.2:** The ATA Business Rules specification expands on S1000D to include civil and CMP business decision points enforced by the ATA civil and CMP BREX files, the use of optional elements and attributes, and the creation of the CMP Layout rules and examples. Some areas in which content can be authored and processed not just for compliance, but also for improved usability, include:
   - Correct use of Title Page, Highlights, LOEDM, TOC, lists and indices generation
   - Common Information Repositories (CIRs) processing
   - Fragment reference processing
   - Applicability processing
   - Hyper-linking for maximum ergonomic benefit
   - Data error reporting and resolution

For these reasons and others, producing content that is not only compliant with the spec (i.e. it validates against the schema) but authored in a way that fully utilizes the capabilities of the spec content usability is essential to delivering tech pubs that add value, not just cost, to your operation.

3. **Migration Strategy for Existing CMM Content:** Writing in two specifications is not ideal for reasons that include training costs, resource flexibility, tooling standardization, and others. Add to these reasons the fact that major aircraft makers like Airbus are migrating mature iSpec 2200 programs to S1000D, and component OEMs are faced with the reality of migrating their existing CMM content and authoring capabilities to the S1000D standard soon. Performing this migration incrementally, in a way that is guided by business as well as technical factors, is important to ensure a strong return on your business’s technical publications investment.

4. **Adherence to Simplified Technical English (STE) Standards:** STE, once a recommended best practice, is now increasingly a requirement to help ensure that technical language is clear, concise, consistent, and amenable to localization where appropriate. For many manufacturers, the road to STE compliance has been a difficult one and adhering to this important standard involves a mix of technology, training, and process that can be daunting.

To meet the challenge of S1000D issue 4.2 CMPs, STE is a requirement and not a “nice to have” feature.
5. Ability to Deliver in a Wide Range of Output Formats:
Different programs and customers require different types of output – sometimes XML, sometimes PDF, sometimes HTML, or even all of the above. Ensuring flexibility in how CMP output is surfaced to OEM customers, and operator end-users is an essential part of a viable S1000D CMP strategy.

6. Support for IETP-Neutral Outputs:
While some component OEMs opt for end-to-end solutions for technical publications authoring and delivery, an increasing number are looking to work with multiple software suppliers for different components of their tech pubs infrastructure. To ensure flexibility to deliver content for virtually any S1000D compliant IETP viewer, delivering content in IETP-neutral formats is an implicit requirement for component manufacturers looking to build their S1000D issue 4.2 CMP capabilities.

7. BREX Rule Compliance:
Providing a robust S1000D CMP capability also means ensuring that business rules implemented via BREX to enforce both spec-mandated, industry-mandated and customer-mandated requirements are implemented correctly. BREX remains one of the most powerful yet most frequently misunderstood part of the S1000D specification, so gaining confidence in this area is an important part of an S1000D issue 4.2 CMP competency.

8. Packaging Flexibility:
Increasingly savvy OEMs are relying on mechanics like Data Module Extensions (DME) Publication Module Extension (PME) to manage some of the complexities of data ownership, provenance, and responsibility that come with the portability and modularity of the S1000D specification. Ensuring that the S1000D issue 4.2 CMP solution includes a provision for delivering either DME/PME or DMC/PMC will help to ensure that the approach is flexible and viable in the long-term.

While this list of issues to be aware of is not exhaustive, it gives some sense of the criteria that component manufacturers should have in mind when charting their course through the S1000D waters.
Some mitigations for these issues include:

1. Choose a Capable Publishing Platform: Many of the challenges highlighted in this article can be addressed through utilizing a publishing platform that is robust, proven in production, like CORENA Manufacturer that includes coverage for requirements like:
   a. S1000D Issue coverage spanning all frequently used 1.x to 4.x issues, with regular new releases as new S1000D issues are made available and a strong roadmap of future functional enhancements.
   b. Publishing format coverage that includes HTML, PDF, and XML with support for a wide range of embedded media types, including 3D, video, and other multimedia that are increasingly relevant in today’s more interactive tech pubs.
c. Support for IETP Neutral Outputs to allow the CSDB to publish to a wide range of commercial IETP viewers.
d. Packaging flexibility to allow published content to be output as DMC / DME or PMC / PME based on the requirements of the customer / recipient for content source tracking.

2. Choose an Experienced Managed and Professional Services Partner: While many OEMs are gaining S1000D proficiency, the ever-changing nature of the specification means that working periodically with a partner makes sense. A partner brings best practices based on close engagement with the spec, the industry and their respective working groups in addition to insight from approaches taken by other manufacturing leaders. Some of the obstacles that a good managed services and professional services provider can help a component OEM address include:

a. Implement a balanced migration strategy: Not all CMM content may require migration. Based on factors such as the lifecycle stage of the product documented, the programs in which the product is used, the relative complexity of the manual, and content delivery requirements of the end-customer, and the scope of CMM migration can be tuned to ensure a sizable return on investment.

b. Compliant BREX rule creation and training: As shown, building a robust S1000D CMP capability means ensuring that BREX business rules used to enforce both spec-mandated, industry-mandated and customer-mandated requirements are implemented correctly. Gaining confidence in this area is an important part of an S1000D issue 4.2 CMP competency.

BREX consulting services like those provided by Flatirons are an area of high value for component OEMs looking to fully engage in S1000D as part of CMP production. A partner like Flatirons can work in tandem with OEM internal resources to create an initial set of BREX business rules to add additional restrictions and use the exercise as an opportunity for knowledge transfer to grow the OEM’s internal resource capabilities.

3. Leverage a Combination of Training and Tool Support to Tackle Simplified Technical English: To be solved effectively, Simplified Technical English usage must be addressed as both a process and technology problem. On the process side, instituting a training regimen that gives authors the skills to use language more concisely and consistently is key. Implementing quality assurance processes that ensure that this training is being used effectively is similarly important. On the technology side, toolsets can help to augment process-based solutions and provide high confidence that the lessons are being applied. Flatirons works with third-party providers of STE authoring plug-ins that enforce adherence to grammar and vocabulary constraints of the specification. For manufacturers not wishing to leverage a full commercial STE solution, custom script-based tools are also available, and can be customized or extended to meet business-specific needs for low-cost STE validation as part of a quality control regimen.
Flatirons is in a unique position to help component manufacturers navigate the S1000D issue 4.2 waters successfully. Our team is an active participant in ATA and S1000D working groups (often as the sole software provider participant) and have a long history in assisting the evolution and deployment of the specification in ways that are responsive to the needs of practitioners in the real-world – both OEMs and Operators.

Flatirons is a software provider of S1000D publishing solutions and an outsourced technical authoring services partner to some of the world’s largest OEMs and airlines. Adopted by some of the world’s leading engine and component OEMs, CORENA Manufacturer is the sole commercially available software solution that is fully compliant with S1000D issue 4.2 Component Maintenance Publications, and virtually all S1000D issues in common use since 1.x. Combined with managed authoring, conversion, migration, and professional services provided by Flatirons that are both production-proven and cost-effective, Flatirons can help component OEMs to deliver world-class S1000D issue 4.2 CMPs, or any other S1000D publication.
While the move to S1000D issue 4.2 CMP brings new requirements for component manufacturers, the investment is worthwhile. CMP brings not only a new publishing paradigm for content creators, but greater product value to customers through content that improves the experience of airframe integrators, and end-user operators. For component OEMs that succeed in transforming their publishing process to be in-line with S1000D issue 4.2 CMP, the rewards include improved access to leading-edge programs, improved brand perception, and greater product value.
For more details on how Flatirons Solutions can help your organization to manage this important transition, please refer to our website at www.flatironssolutions.com, or contact us at info@flatironssolutions.com for a consultation.
Flatirons knows the importance of clearly delivering the right information, at the right time, to the right people.

Flatirons Solutions® provides solutions for content lifecycle management for large asset industries like aviation, defense, rail, and marine. For more than 20 years, it has helped manufacturers, operators, and military forces maintain and operate complex assets more effectively. Its software and service solutions help organizations deliver the right information, at the right time, to the right people — Turning Content into Knowledge®.

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