Transforming iSpec 2200 to S1000D and Back: Real World Experiences

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Agenda

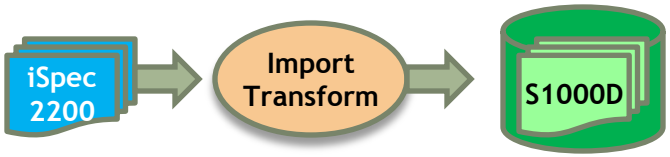
- Project Description
- Mapping Core Constructs
- Paradigm Shifts
- Summary
- Conclusion

Project Description

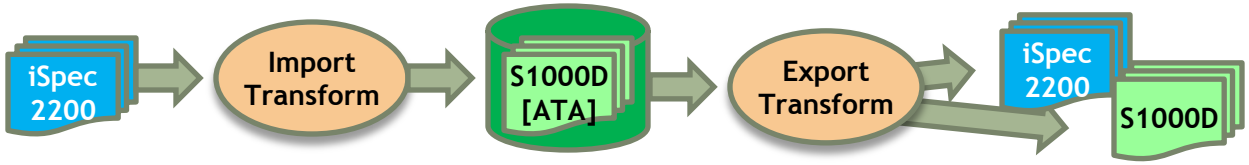
- S1000D based system
- Started in 2005
- Core support for issue 3.0, 4.0.1, +
- Transform iSpec 2200 to 4.0.1 and back
- Work with OEM aircraft and engine maintenance data
- Transform between S1000D issues

Project Description

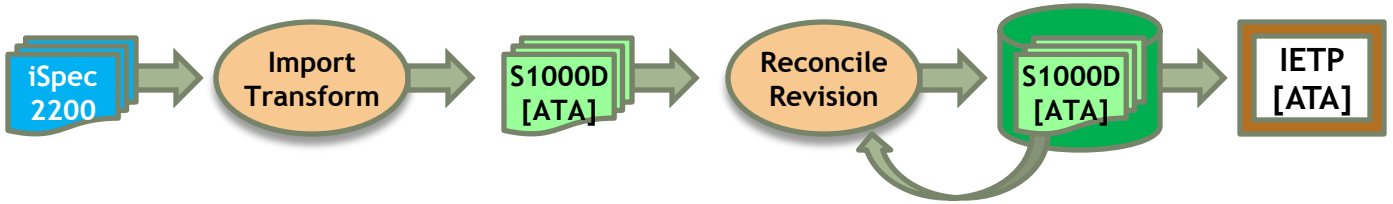
- **Different operational paradigms**
  - One-time: OEM iSpec 2200 to S1000D for delivery



  - Round-trip: OEM iSpec 2200 to S1000D, delivering both iSpec 2200 and S1000D



  - Periodic revision import: Airline converting each OEM iSpec 2200 revision to S1000D



Project Description

- **No ideal mapping**
  - Specifications introduce new features
  - Feature paradigms change (e.g. applicability)
  - Requires creative mapping or extensions
  - What happens in the system, stays in the system
  - iSpec 2200 round-trip to S1000D and back can be automated
    - S1000D intermediate must preserve non-S1000D constructs and is not deliverable as proper S1000D
    - Can be purified (removing ATA unique attributes), but is not how it would be authored natively in S1000D
  - Can be presented in traditional ATA style
  - iSpec 2200 one-way to S1000D requires authoring

Mapping Core Constructs

- iSpec 2200 Manual to S1000D Publications
  - ✓ iSpec 2200 structure (chapter, section, etc.) maps directly to S1000D publication modules/pmEntry's
    - PM naming limits options
  - For round-trip must preserve anchor attributes
    - CHAPTER maps to PM w/ATA attributes
    - SECTION maps to pmEntry w/ATA attributes
- Primary content Anchors to Modules
  - ✓ Most iSpec 2200 content in anchors compatible with data modules – task, figure, pageset, cpsheet
  - Very few anomalies like AMM page block
- Handling lower anchors round-trip
  - SUBTASK maps to proceduralStep w/ATA attributes

Mapping Core Constructs

- **AMTOSS/JEMOSS to Data Module Code (DMC)**
  - ✓Core similarity (AMTOSS/JEMTOSS to DMC):
    - ✓Chapter – system
    - ✓Function code – information code
  - ➢Different rules for defaulting
    - ➢varnbr vs. infoCodeVariant
  - ➢Manual level vs. global level uniqueness
  - ➢Where to capture ATA manual/doctype in DMC
  - ➢iSpec sequence number, etc. have no proper place
    - ➢Concern for round-trip back to iSpec 2200 & DMC uniqueness
  - ✓Decision:
    - ✓Algorithmic mapping w/special rules (e.g for infoCodes)
    - ✓Explicit one-to-one map

Mapping Core Constructs

- **REFINT/REFEXT to internalRef/dmRef**
  - ✓Manual vs. module scoping:
    - ✓ compatible
    - ➢ Round-trip needs support for manual scope concept
- **Effectivity to Applicability**
  - ✓S1000D applicability is flexible superset of iSpec effectivity
  - ➢iSpec has no syntax for relating multiple SBs
  - ➢Constrain applic use in S1000D to anchor equivalents
    - ➢ Problematic to interpret scope iSpec 2200 SGML effect by inclusion directly, and more so after conversion to S1000D

Paradigm Shifts: iSpec GNBR vs. S1000D ICN

iSpec GNBR	S1000D ICN
➢ Persistent GNBR usually does not change when illustration changes	✓ Issue specific ICN is unique for changed illustration
➢ Changed illustration picked up for all uses unless using element is changed	✓ Changed illustration is used only if using element in DM is changed
➢ Lack of explicit indicator for illustration change complicates management	✓ ICN issue number changes to mark illustration change, simplifies management
➢ Use of graphic entities allow GNBR and filename to differ	✓ Base filename = infoEntityident

- **Need special handling of iSpec illustrations**
  - **Determine when illustration has changed**
  - **Maintain map to proper ICN**

Paradigm Shifts: Tech Repositories

- iSpec 2200 constructs used differently:
  - AIPC PNRFILE with part data
  - FRMFIM fault message data
  - Wiring equipment and wire lists
  - iSpec 2200 vendor lists used in many doctypes
  - All of these local to one manual instance
- S1000D has a variety:
  - TIRs for Functional items, Circuit breakers, Parts, Zones, access points, Enterprise information, Supplies, Supplies requirements, Tools, Functional areas, Controls and indicators
  - All of these have no inherit scope limitation
  - FRMFIM fault message data and wiring equipment and wire lists are not TIRs but handled in dedicated modules types
- In 4.1: *Common Information Repository*

Paradigm Shifts: Tech Repositories

- Issues:
  - S1000D limits where TIR entries can be referenced without using a dmRef/@referredFragment (pointing to ID of the target element in DM)
  - Good for dynamic IETP display, but incompatible content models limit rendering TIR information in-line as for XML to be rendered to PDF
  - S1000D Enterprise information TIR is only place to store structured data for address, phone, etc. thus choice is:
    - Un-structure data into a simple DM
    - Migrate date to Enterprise TIR and reference those entries
    - Display the TIR

Paradigm Shifts: Task Frontmatter & In-Line Refs

- Task frontmatter tables for parts, consumables, tools, etc.

- In-Line para level markup where parts, consumables, tools, etc. are used

➢ iSpec 2200 and S000D have nearly opposite approach to the paradigm

Paradigm Shifts: Task Frontmatter & In-Line Refs

iSpec Task PreReqs	S1000D Preliminary Req
➢ Generic tables	➢ Content specific structure
➢ No specific or standard structure	➢ Highly specific content models
➢ Table entries are not target of in-line markup	➢ Entries designed to be target of in-line markup
➢ Table entries usually don't reference external data	➢ Entries usually reference external data for item

Paradigm Shifts: Task Frontmatter & In-Line Refs

iSpec In-Line Markup

- ✓ Dedicated elements (CON, CSN, STD etc.)
- ✓ Logically targets external data
- ➢ iSpec says doesn't behave as link, but frequently links to target in external manual

S1000D In-Line Markup

- ➢ Limited dedicated elements like circuitBreakerRef
- ➢ Use internalRef to point to supply, part, in prelim req tables
- ✓ Link takes user to table in module
- ✓ Entry in table links to external manual

Paradigm Shifts: Task Frontmatter & In-Line Refs

iSpec Editing

- ✓ Focus on editing in-line markup
- ✓ Insert in-line markup where desired
- ✓ Points to external manual
- ✓ Derive basic frontmatter tables from in-line markup with no need for formal authoring

S1000D Editing

- ➢ Focus on editing prelim req tables
- ➢ Add entry to prelim req tables when needed
- ➢ Table entry points to target DM or TIR, potentially both
- ➢ Use generic internal reference in-line to point to prelim req table

Paradigm Shifts: Task Frontmatter & In-Line Refs

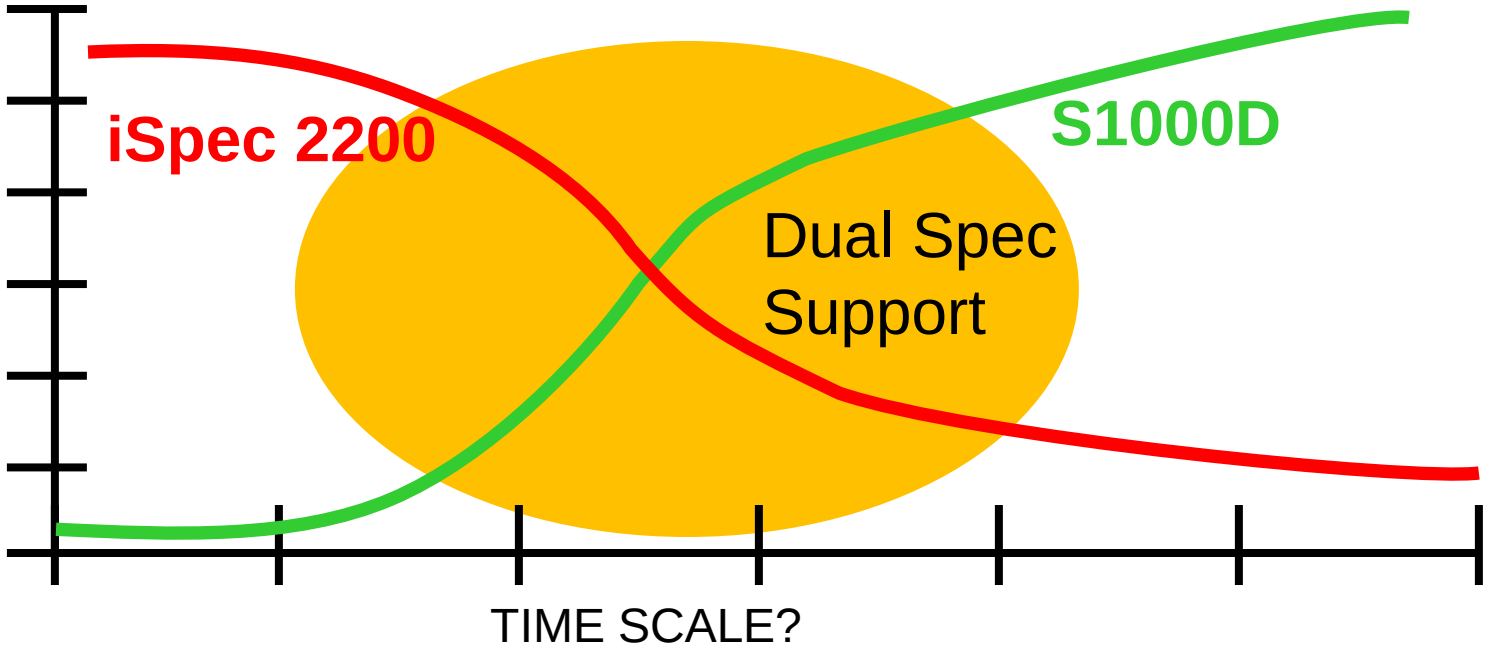
- Transformation Issues
  - iSpec task pre-reqs lack information needed to build S1000D preliminary req tables
  - Without S1000D preliminary req tables for targets, iSpec in-line markup cannot be transformed to S1000D internal refs
  - Problematic to capture iSpec in-line markup
  - Transform from S1000D back to iSpec is straightforward, but dumbs down information

Paradigm Shifts: Task Frontmatter & In-Line Refs

- Net
  - Can round-trip iSpec data in S1000D with special handling
    - For example, capturing iSpec CON with an S1000D controlIndicatorRef with special type
  - One-way transform requires authoring of proper S1000D preliminary req data

Summary

- S1000D is coming
- Both OEM and Airline transitions take time



Summary: Why Do You Care?

- **Cost for supporting two standards at once**
  - Existing airframes now only iSpec 2200
  - New airframes require S1000D
- **Costs in transition**
  - Two systems
  - Tech pubs and support must work in both environments
  - Technicians may need to work in both systems
- **iSpec 2200 to S1000D transformation provides single, integrated solution**
  - One-time: OEM iSpec 2200 to S1000D
  - Round-trip: OEM iSpec 2200 to S1000D and back
  - Revision import: iSpec 2200 revisions to S1000D

Summary: This is real

- **No magic, hard decisions are needed**
- **Round-trip iSpec 2200 to S1000D can be automated**
  - A given source data class requires some unique setup
  - Similar to support needed for native iSpec 2200
- **Single solution can support iSpec 2200 and S1000D**

Conclusion

- **Acknowledgements**
  - Delta Airlines, Minneapolis
  - X-Hive
  - Rolls-Royce Group plc
- **Link to last year's presentation**
  - http://www.ataebiz.org/forum/2010_ata_e-biz_forum/Mayer_Transforming2200toS1000D.pdf
- **Questions and answers**

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