# S1000D

## BOSTON DITA Users Group S1000D

Charles Angione - CTO

# S1000D Vision

- To be the globally adopted specification for efficient interoperable technical information for operations, maintenance and training that support the life cycle of the product.

# S1000D History

- 1984: initiated by seven European ASD countries and UK MoD
- June 1989: First release signed
- 2001: American Industry Association joined
- 2005: Civil aviation joined

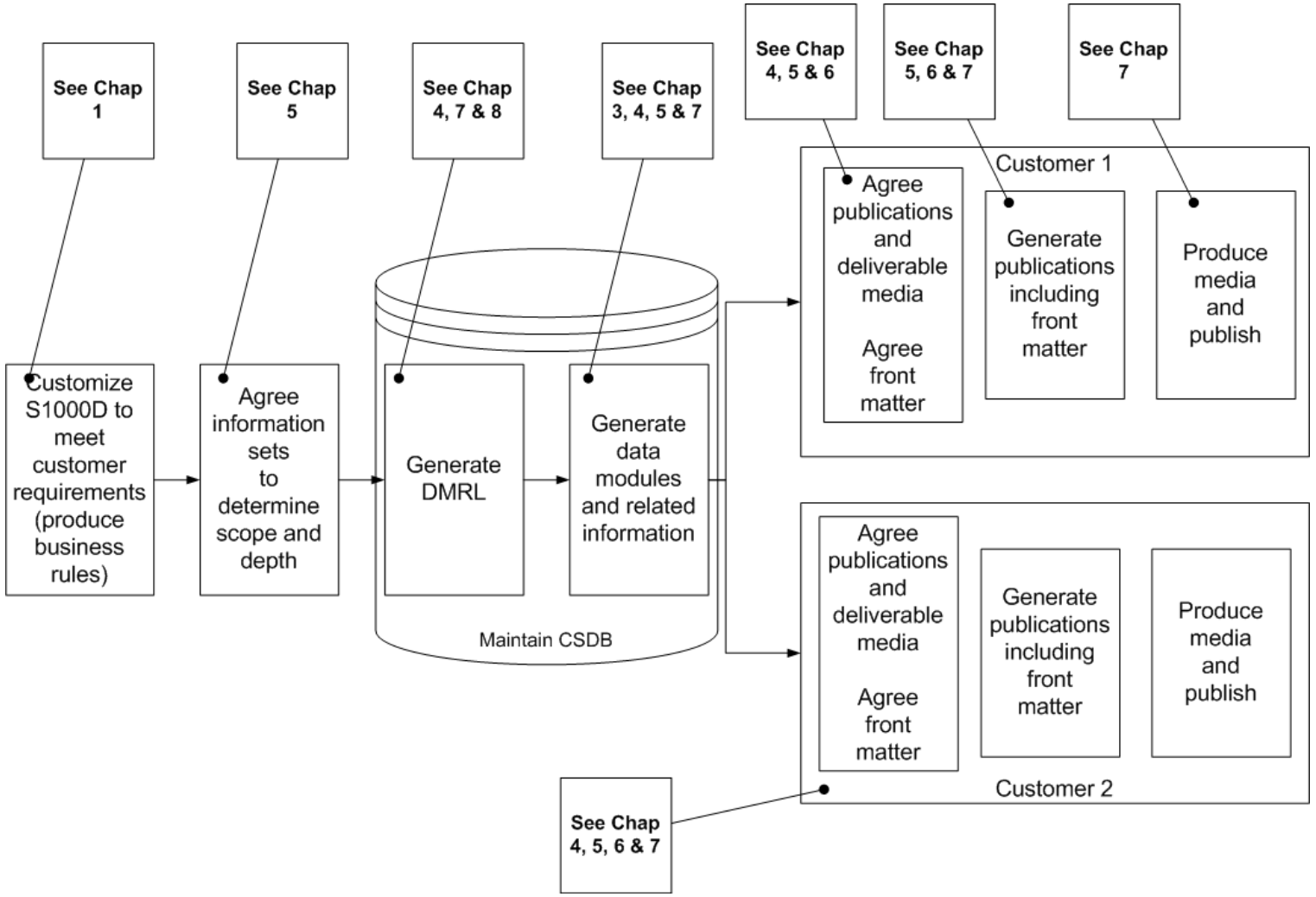
- Free of charge common international specification developed by ASD, AIA and ATA
  www.S1000D.org

ASD
AeroSpace and Defence
Industries Association of Europe

AIA
AEROSPACE INDUSTRIES ASSOCIATION

Air Transport Association

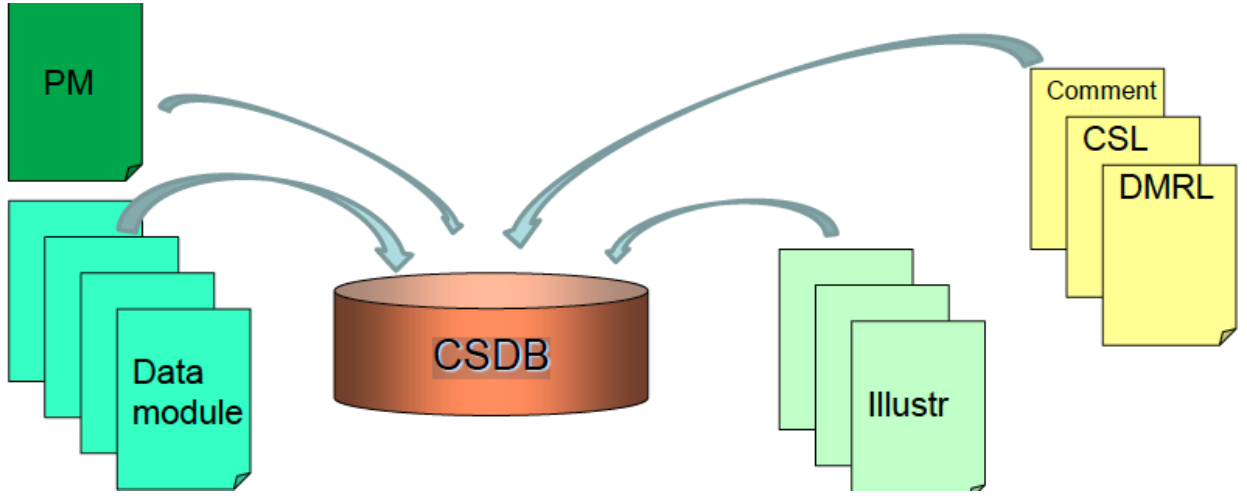
# The basic S1000D process



# S1000D Terminology and Concepts

# CSDB - Common Source DataBase

- A virtual store for the objects produced by a project or program:
  - Data Modules
  - Graphics/Multi media
- As a product producer you will live with your CSDB for several decades.



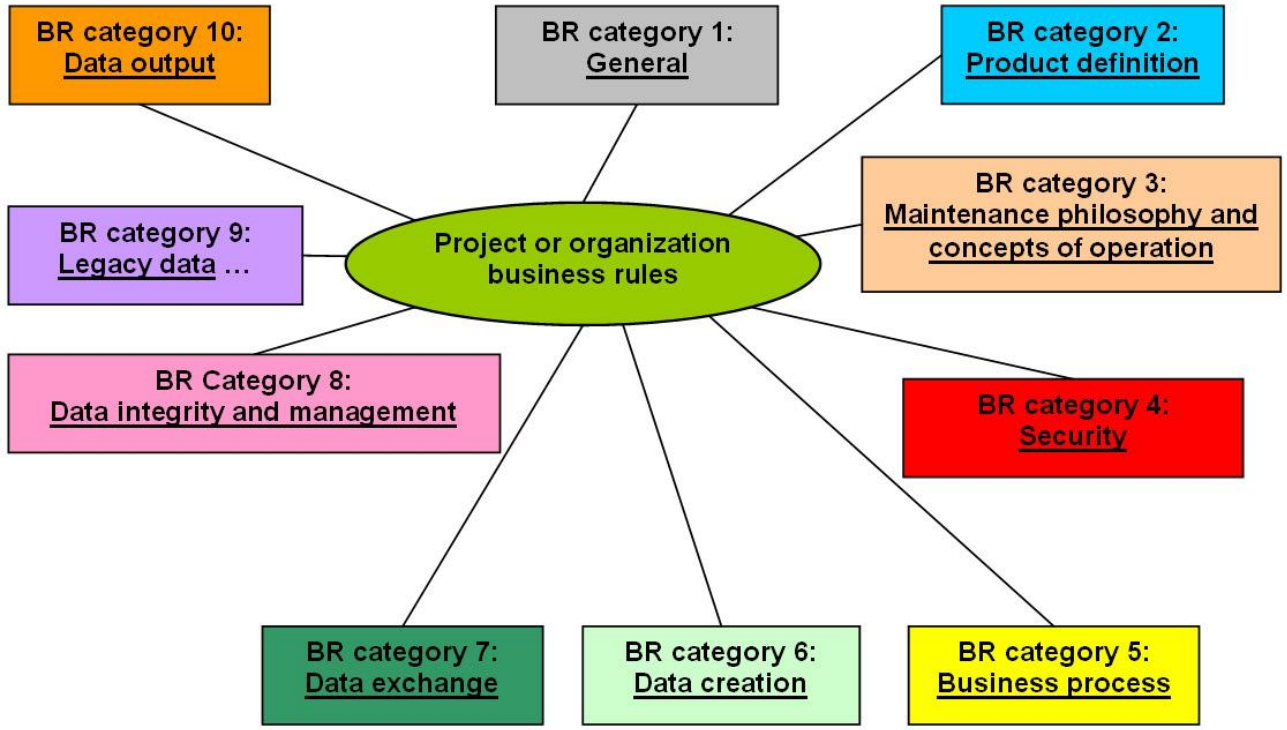
# S1000D Issue Numbers

Sample DM Life Cycle

| No. | issueNumber | inWork | issueType | qualityAssurance | verification Type |
|---|---|---|---|---|---|
| 1 | 000 | 01 | new | unverified | – |
| 2 | 000 | 02 | new | unverified | – |
| 3 | 000 | 03 | new | firstVerification | tabtop |
| 4 | 001 | 00 | new | firstVerification<br>secondVerification | tabtop onobject |
| 5 | 001 | 01 | changed | unverified | – |
| 6 | 001 | 02 | changed | firstVerification | tabtop |
| 7 | 002 | 00 | changed | firstVerification<br>secondVerification | tabtop tabtop |

# Business Rules (Chap 2.5, 2.5.3 decisions)

- Essential for S1000D implementation
- S1000D contains many Business Rules decision points!
- The *Business Rules for a project or organization* is the entire set of business rules that have been decide for the project/organization with regard to the S1000D implementation.



# SNS – Standard Numbering System

# Work Breakdown Structure (WBS)

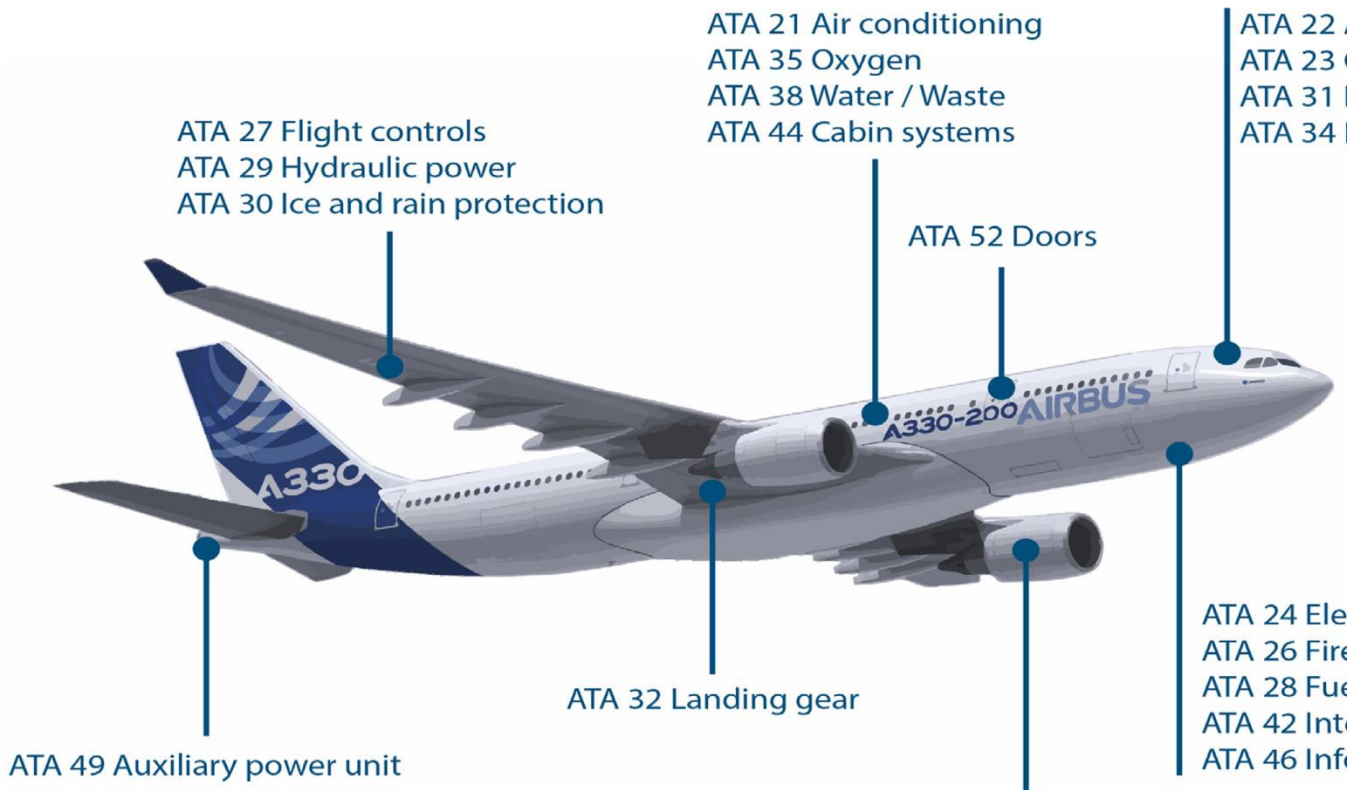
A Work Breakdown Structure (WBS) (MIL-STD-881D) is a tool used to define a project in discrete work elements in a Hierarchical format. It relates the elements of work to be accomplished to each other and to the end product.

The WBS is an organized method to breakdown a product into subproducts at lower levels of detail. It's used for planning, cost estimating, execution and control.

The first three Work Breakdown Structure Levels are organized as:

| Level 1: Overall System | Level 2: Major Elements (Sub System) | Level 3: Subordinate Components (Sub – Sub System) |
|---|---|---|

# ATA SNS – Airbus A330




ATA 27 Flight controls
ATA 29 Hydraulic power
ATA 30 Ice and rain protection

ATA 21 Air conditioning
ATA 35 Oxygen
ATA 38 Water / Waste
ATA 44 Cabin systems

ATA 52 Doors

ATA 22 Auto-flight
ATA 23 Communication
ATA 31 Instruments
ATA 34 Navigation

ATA 49 Auxiliary power unit

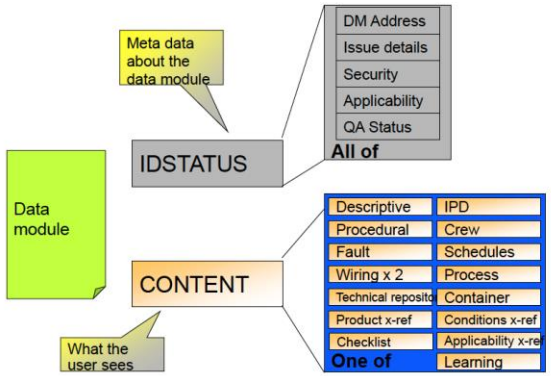
ATA 32 Landing gear

ATA 73 to 80 Engine

ATA 24 Electrical system
ATA 26 Fire protection
ATA 28 Fuel Systems
ATA 42 Integrated Modular Avionics
ATA 46 Information System

# Data Module

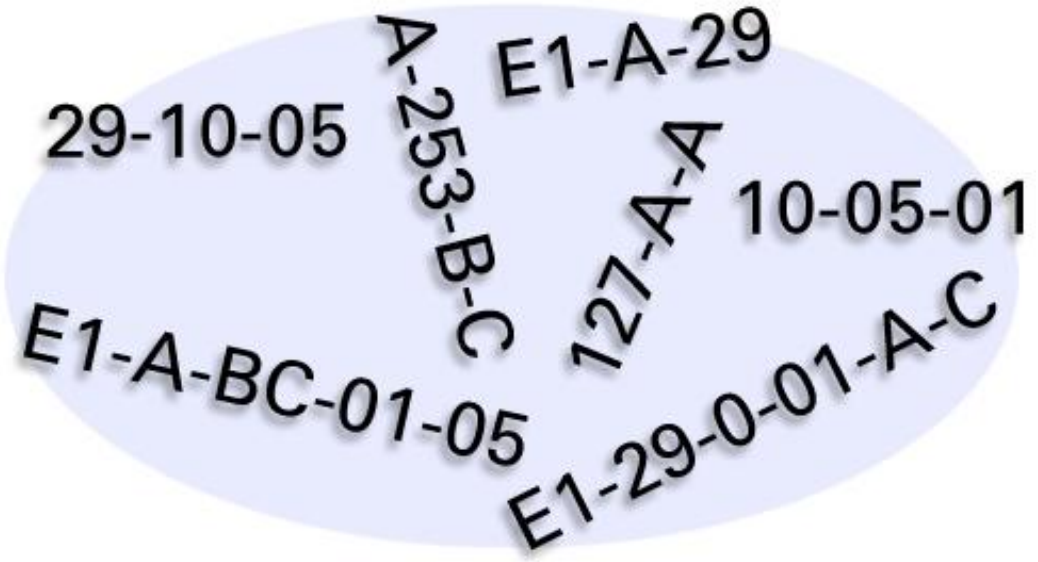
- A stand-alone information unit comprising descriptive, procedural, operational data for a Materiel or a component thereof
- The unit is produced in such a form that it could be stored and retrieved from a CSDB by the data module code as the identifier
- Produce in SGML/XML according to specific DTD/SCHEMAS



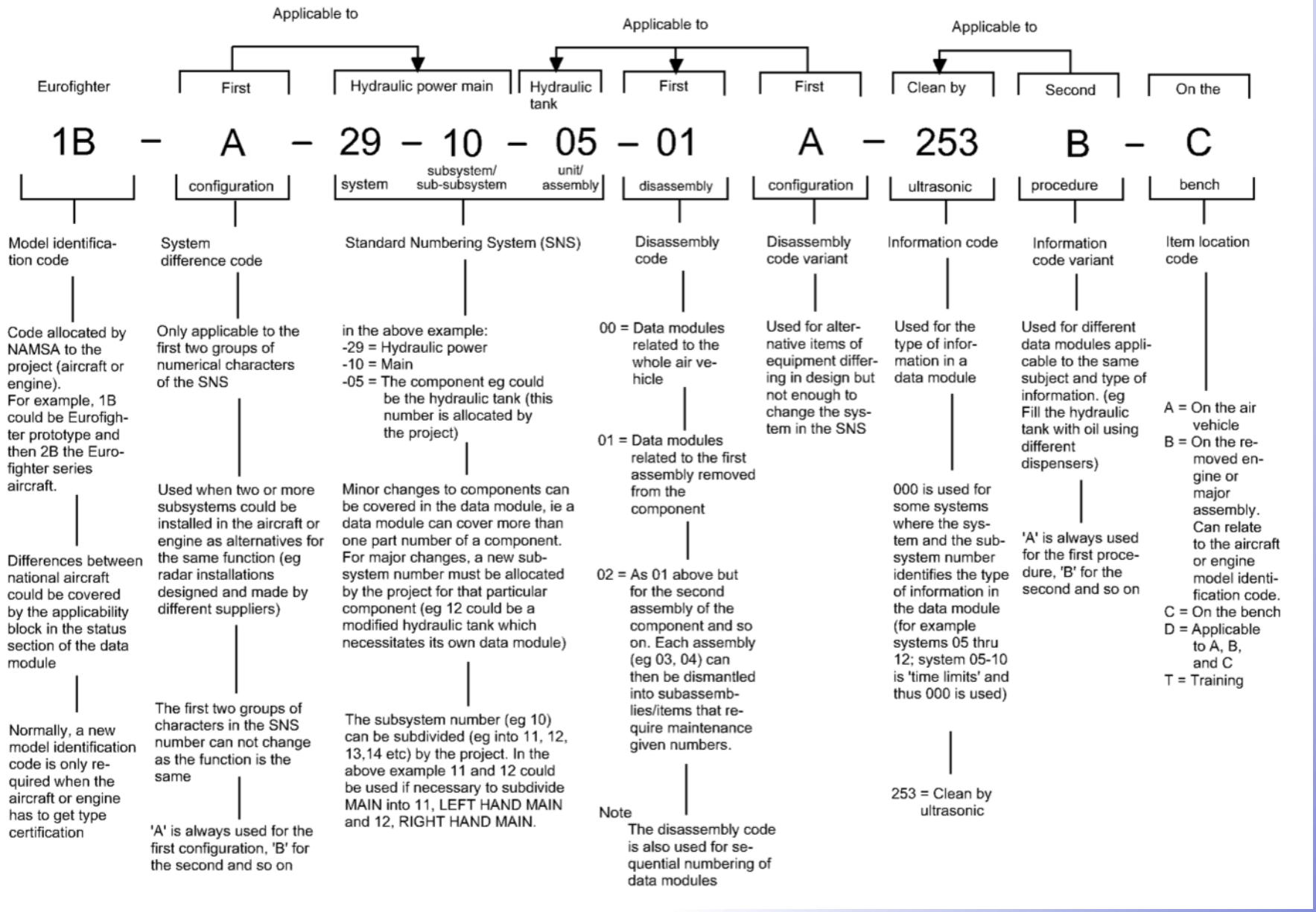
# DMC - Data Module Code

- A 17 to 41 character alphanumeric code identifying the type and the applicability of the data in a data module and enabling it to be input into and retrieved from, a database

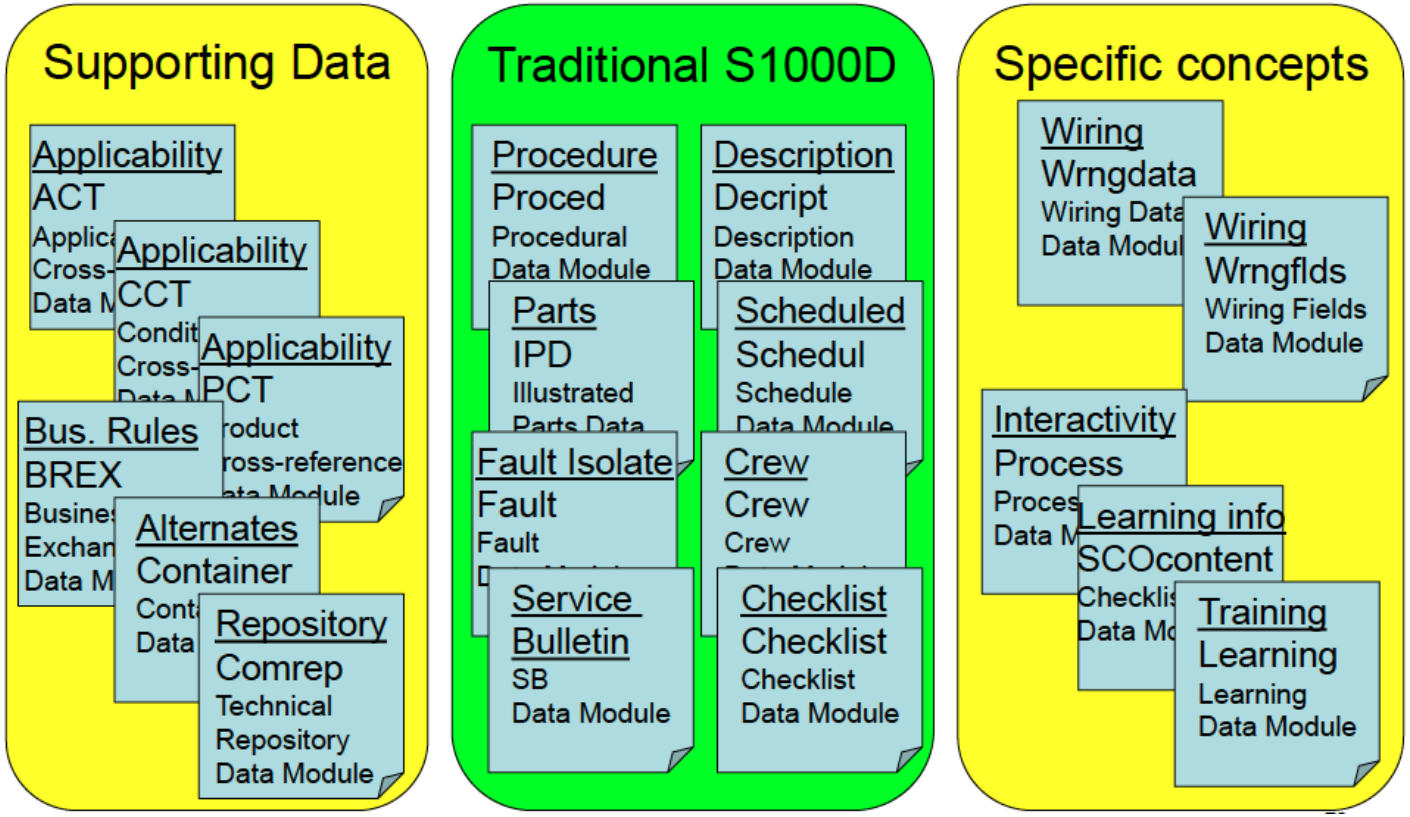
- The DMC defines the data module in terms of:
  - Assembly/sub-assembly/item information, providing information about the equipment being documented.
    - Equipment
    - Hierarchical position
    - Disassembly sequence
  - Module usage information, providing information about the Data Module.
    - Information Contents
    - Location



# Data Module Code Example – Eurofighter



# Data Module Types



# Repository Types (Chap 4.13.1, and Chap 3.9.5.2.11)

**Supported from Issue 4.0**

Functional item numbers
Circuit breakers
Parts
Zones
Access points
Tools
Enterprises
Supplies
Support equipment
Physical / functional areas (breakdown)
Controls and indicators

**Added in Issue 4.1 *(Common Information Repository)***

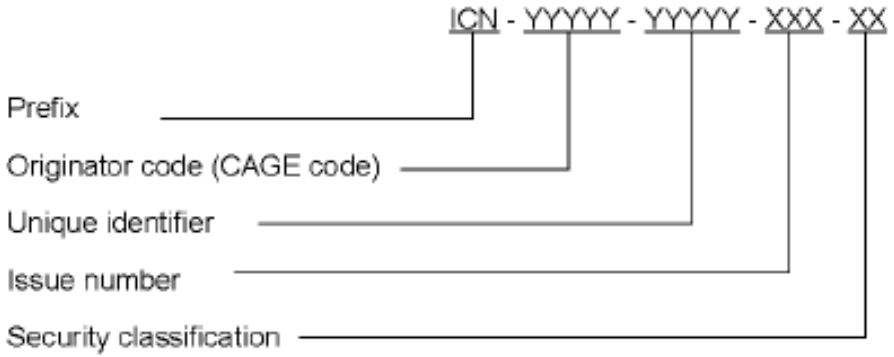
Warnings
Cautions
Applicability statements

# Information Control Number (ICN)

- The unique identifier ‘code’ for a non XML entity, is called the: Information Control Number (illustration sheet, multimedia object or other data attached to a data module)
- ICN is independent of the file format
- Derived from a hierarchical breakdown of a particular type of equipment and sequence number.

The unique ICN can be based on:

a company/organization code - CAGE code based




**Or**

a project code - model identification code based

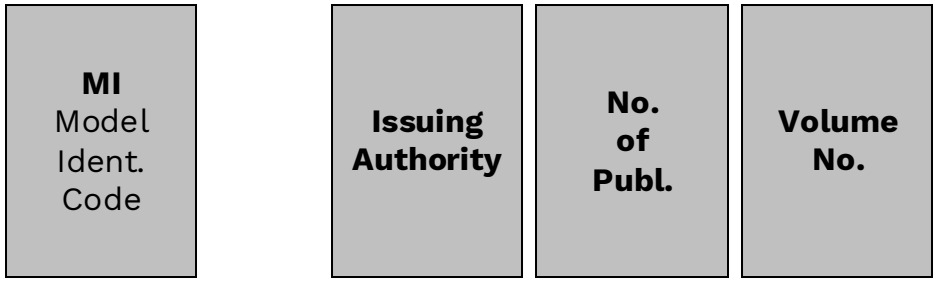
**ICN-S1000DBIKE-BBB-D000000-P-U8025-00502-A-004-01**

| Prefix | **MI** Model Ident. Code | **SDC** system Difference Code | **SNS** Satndard Numbering System Code | **RPC** Resp. Partner Company | **CAGE Code** (Orig.) | Unique Identifier | Variant Code | Issue Number | Security Classif. |
|---|---|---|---|---|---|---|---|---|---|

# Publication Module

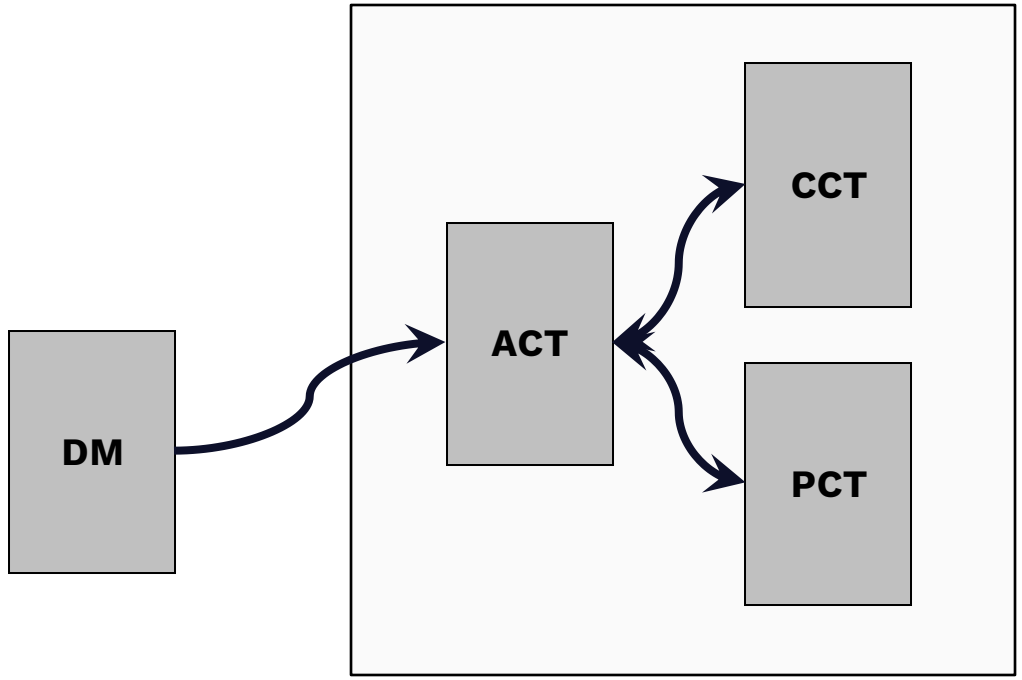
- The publication module defines the content and the structure of a publication. It is to contain one or more references to:
  - Data modules (including front matter data modules and access illustration data modules)
  - Publication modules
  - Legacy technical publications
- The unique identifier ‘code’ for a publication is called the: Publication Module Code (PMC)
  - A 14 to 26 character standardized and structured identifier of a publication module or a final deliverable publication

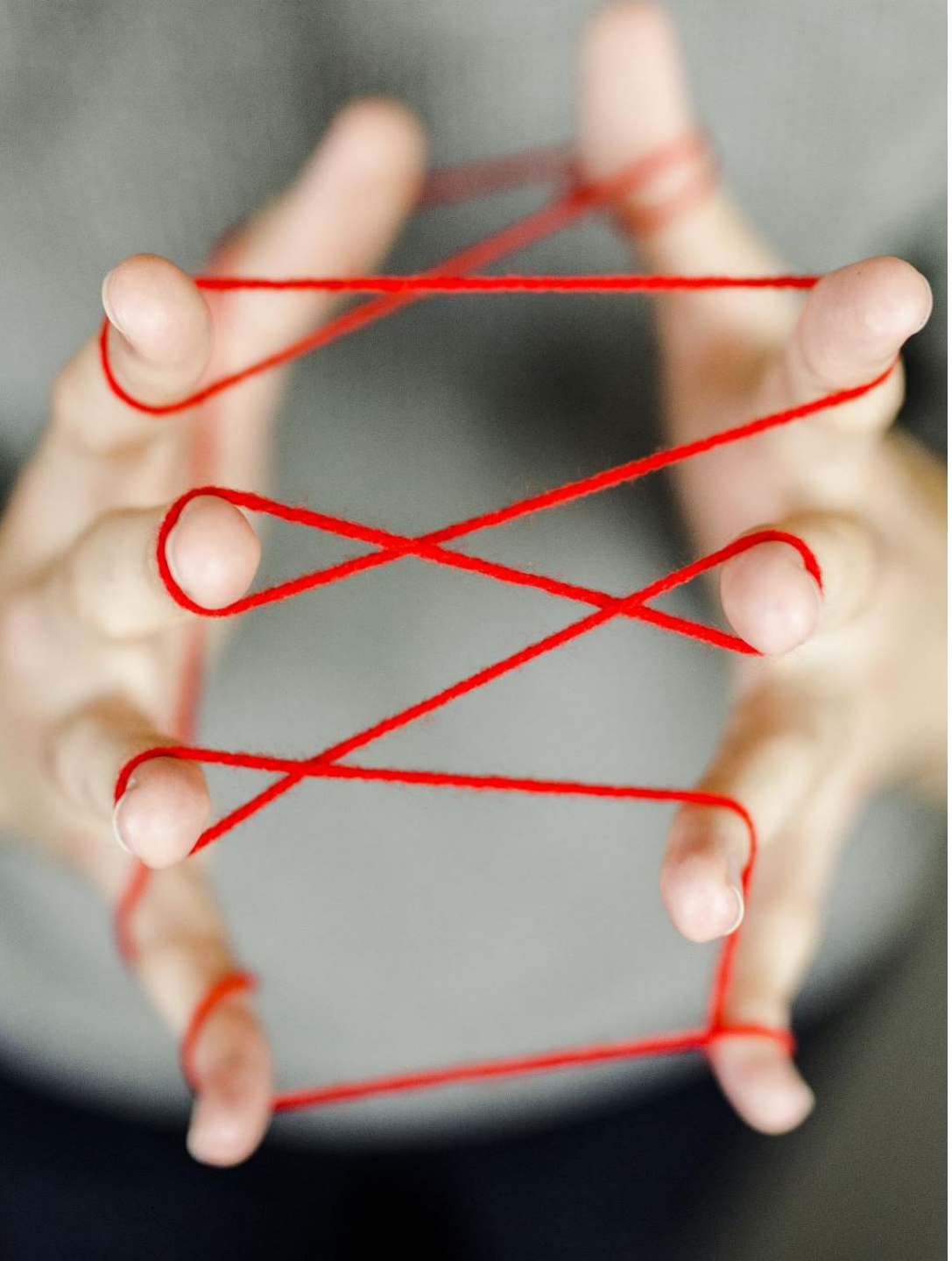
**S1000DBIKE - 0K0D7 - 00001 - 00**



# ACT, PCT and CCT applicability

- Applicability Cross-reference Table (ACT):
  - Defines product attributes (Serial number, Tail number, model, …)
- Conditions Cross-reference Table (CCT):
  - Defines technical or operational conditions (pre/post SB, icy , condition, …)
- Product Cross-reference Table (PCT):
  - Defines product instances



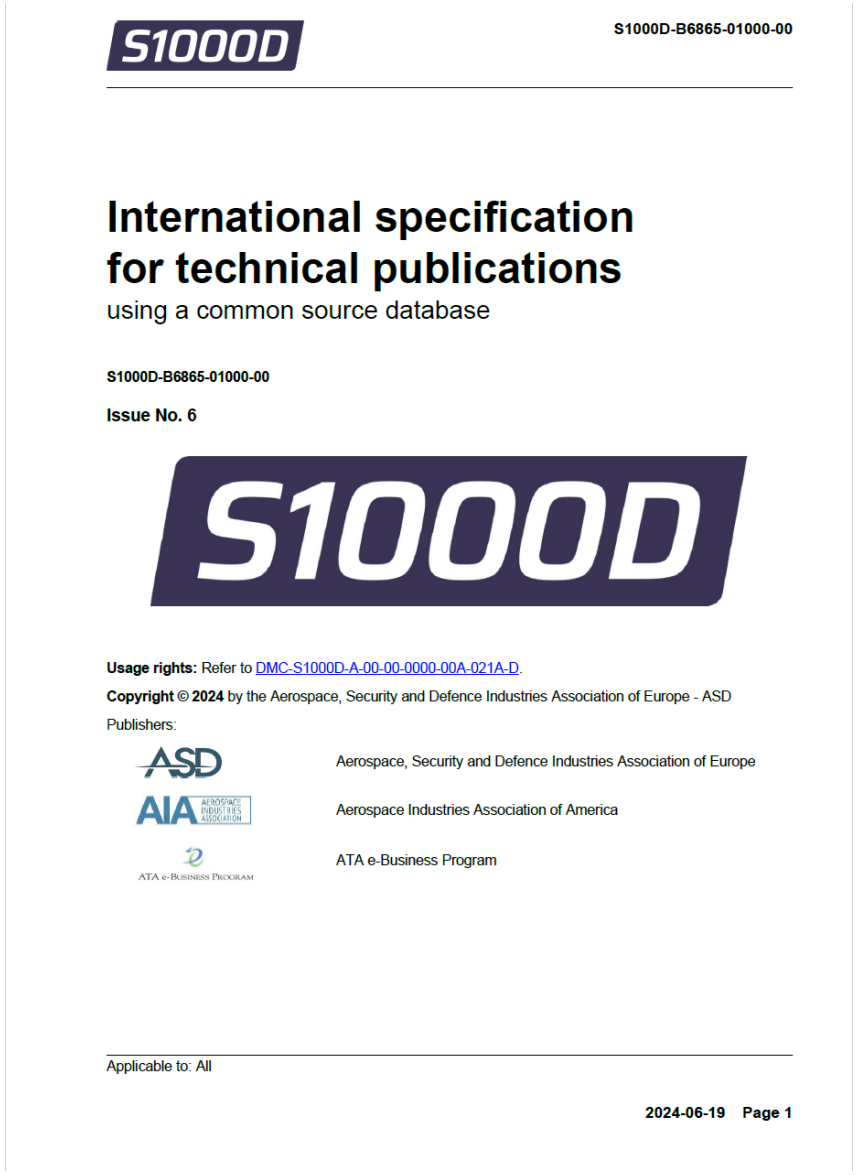


# Applicability Example

```
<applic>
  <displaytext>
    S/N 1-10 with Tekro brakes; S/N 1-20 with Shimano brakes
  </displaytext>
  <evaluate oper="or">
    <evaluate oper="and">
      <assert actidref="serialNo" actreftype=“prodattr” actvalues="1~10"/>
      <assert actidref="brakes" actreftype=“condition” actvalues="Tekro"/>
    </evaluate>
    <evaluate oper="and">
      <assert actidref="serialNo" actreftype=“prodattr” actvalues="1~20"/>
      <assert actidref="brakes" actreftype=“condition” actvalues="Shimano"/>
    </evaluate>
  </evaluate>
</applic>
```

# Issue 6

- Released 2024
- Additional CIR Types:
  - Hazards
  - Terminology
- Minor updates/corrections to the Schema
- Updated BIKE Dataset



S1000D

S1000D-B6865-01000-00

**International specification for technical publications**

using a common source database

**S1000D-B6865-01000-00**

**Issue No. 6**

S1000D

**Usage rights:** Refer to DMC-S1000D-A-00-00-0000-00A-021A-D.

**Copyright © 2024** by the Aerospace, Security and Defence Industries Association of Europe - ASD

Publishers:

ASD — Aerospace, Security and Defence Industries Association of Europe

AIA — Aerospace Industries Association of America

ATA e-Business Program — ATA e-Business Program

Applicable to: All

**2024-06-19 Page 1**

# DITA or S1000D?

**DITA:**

- More flexible and adaptable XML-based standard
- Can be implemented gradually and scaled as needed
- Supports extensive customization through specialization
- Easier to start with and grow into

**S1000D:**

- Strict, highly structured XML-based specification with comprehensive implementation from the start
- Limited customization options to maintain standardization
- Has unique features like:
  - Data Module Codes (DMC)
  - Formal Business Rules Exchange (BREX)
  - Illustrated Parts Data (IPD) support
  - Built-in fault isolation structures

# THANK YOU!

CHARLES ANGIONE
CTO & President
GPSL Inc
TWITTER
@cangione
WEBSITE
gpsl.co