S1000D Users Forum 2010

"Application of S1000D within a state-of-the-art Integrated Logistic Support environment"

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Service Bulletin Enhancements in S1000D Release 4.1

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Today’stopics

1. Service bulletins
2. History
3. Service Bulletin changes in Issue 4.1
4. Summary/ Questions

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Service Bulletins

- A Service bulletin provides a complete set of instructions required to:
  - Modify the Product to a new configuration (also known as "retrofitting"")
  - Provide a special inspection or check required to determine whether the Product is in a safe operating condition
  - Evaluate a part temporarily installed on the Product

- A service bulletin is not used to provide:
- Routine scheduled maintenance or inspections
- Standard repairs
- Revisions to maintenance or shop practices

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Service Bulletins

History

The language in S1000D specifying Service bulletins was written a long time ago (prior to Issue 1.9)

- No significant updates have been made to the service bulletin language since it was first added to the Specification
- In Issue 4.0.1, Chapter 5.2.1.16 "Common information sets - Service bulletins" is out-of-date compared to current industry business requirements
- Very few manufacturers have attempted to implement Service bulletins as specified in S1000D, so the language has not had much "real world" testing

Service Bulletins

History

Adding the Air Transport Association of America (ATA) as a sponsoring organization for S1000D brought to light deficiencies in the language about service bulletins

- The ATA Civil Aviation Working Group (CAWG) chartered the Service Bulletin Project Team to perform a gap analysis on Service bulletin specifications between S1000D and the ATA iSpec 2200
- Many deficiencies were discovered and documented

Service Bulletins

History - SBTT

In 2007 the S1000D Steering Committee chartered the Service Bulletin Task Team (SBTT) to:

- Review the Civil Aviation service bulletin gap analysis from a broader perspective (military and civil; air, land and sea)
- Propose an architecture for delivering Service bulletins as per S1000D
- Develop and implement a suite of S1000D Change Proposal Forms (CPFs) based on the analysis and architecture

The SBTT strategic goal was

The future S1000D specification and schemas for Service bulletins should be optimized to support integrated use of Service bulletin information and the resulting changes to publications

- For example, semantic markup of parts information should be considered to support pre- and post-modification configuration of manuals and technical data

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Service bulletins
in Issue 4.1

The specification for Service bulletins in S1000D is being changed in Issue 4.1 to improve these areas:

- Implement the new architecture for delivering a service bulletin
- Improve the richness of tagged data in XML delivery of service bulletins
- Enhance procedural data modules to support requirements unique to retrofit instructions
- Correct errors and readability problems discovered in Issue 4.0.1
- Implement changes required for Civil aviation

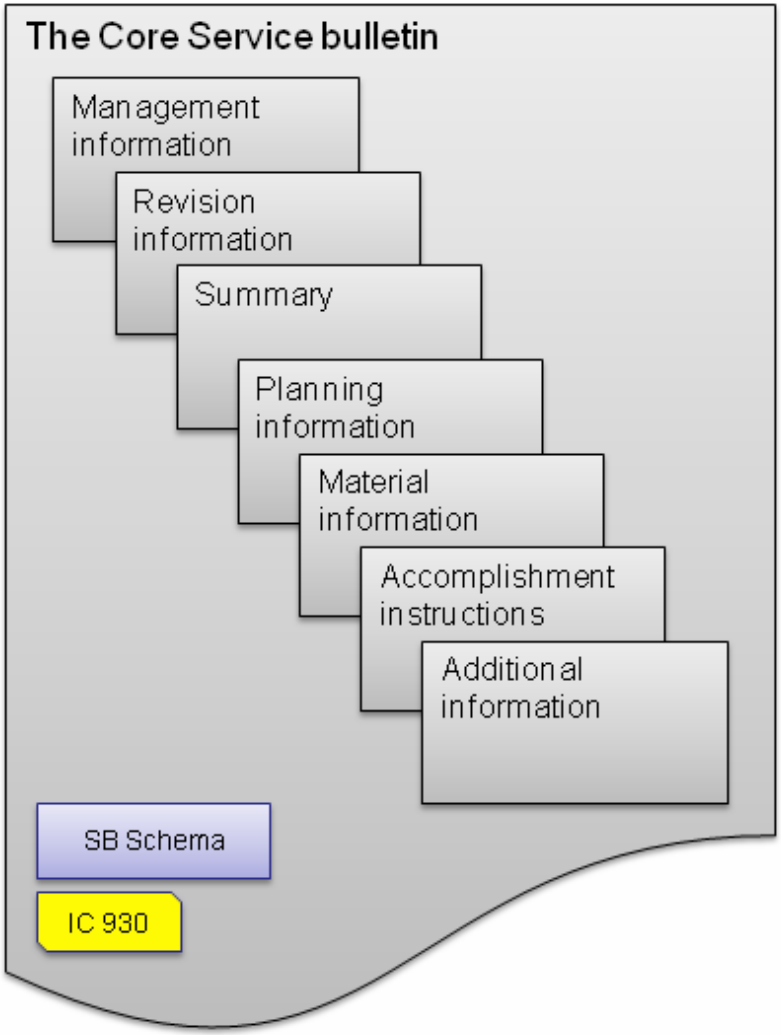
Service bulletins
in Issue 4.1

- Development of a Service bulletin Schema in S1000D is intended to allow improvements to Service bulletin understanding, application and processing.
- The S1000D modular approach will:
  - Enhance integration with other maintenance procedures
  - Avoid data duplication.
    - Access to shared referential & repository for all procedures
  - Enhance navigability and search capability for users of IETP

Service bulletins

The new architecture

A new Service bulletin data module type (Schema) has been developed to deliver the main topics for an SB within a single data module



Service Bulletin

Management information

The main topic Management information contains semantically tagged metadata about the service bulletin

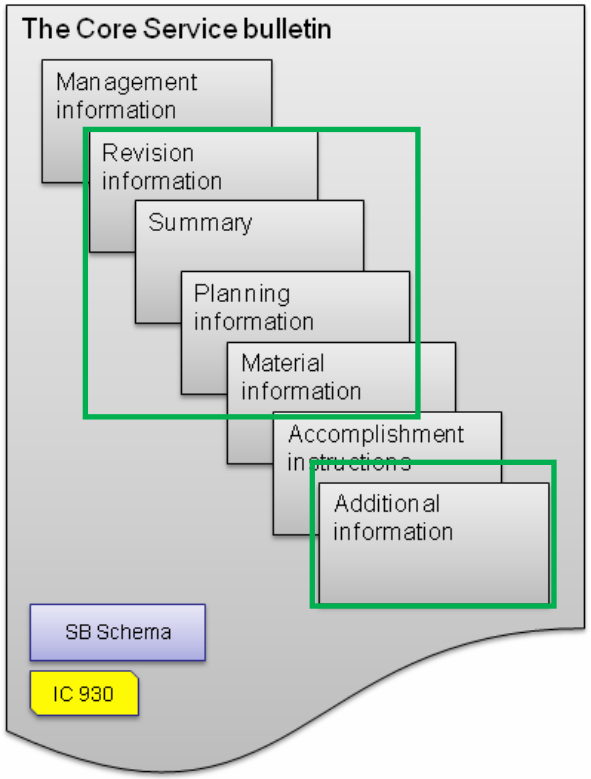
- This allows users to quickly find service bulletins which fulfill particular search parameters, for example:
  - Alert service bulletins
  - Compliance category and accomplishment limits
  - Type of task (modification, inspection, etc.)
  - Estimate of the time required to complete the task
- This also supports regulatory and approval requirements:
  - A clearly defined list of data modules that make up the service bulletin, for use by regulatory agencies and other approving entities
  - An approval identifier to indicate the authority under which the service bulletin was approved

Service Bulletin

Descriptive topics

The new service bulletin data module type has several branches for topics that are descriptive in nature. These branches use a content model very similar to that of the descriptive data module:

- Revision information
- Summary
- Planning information
- Additional information



Service bulletins

Material information

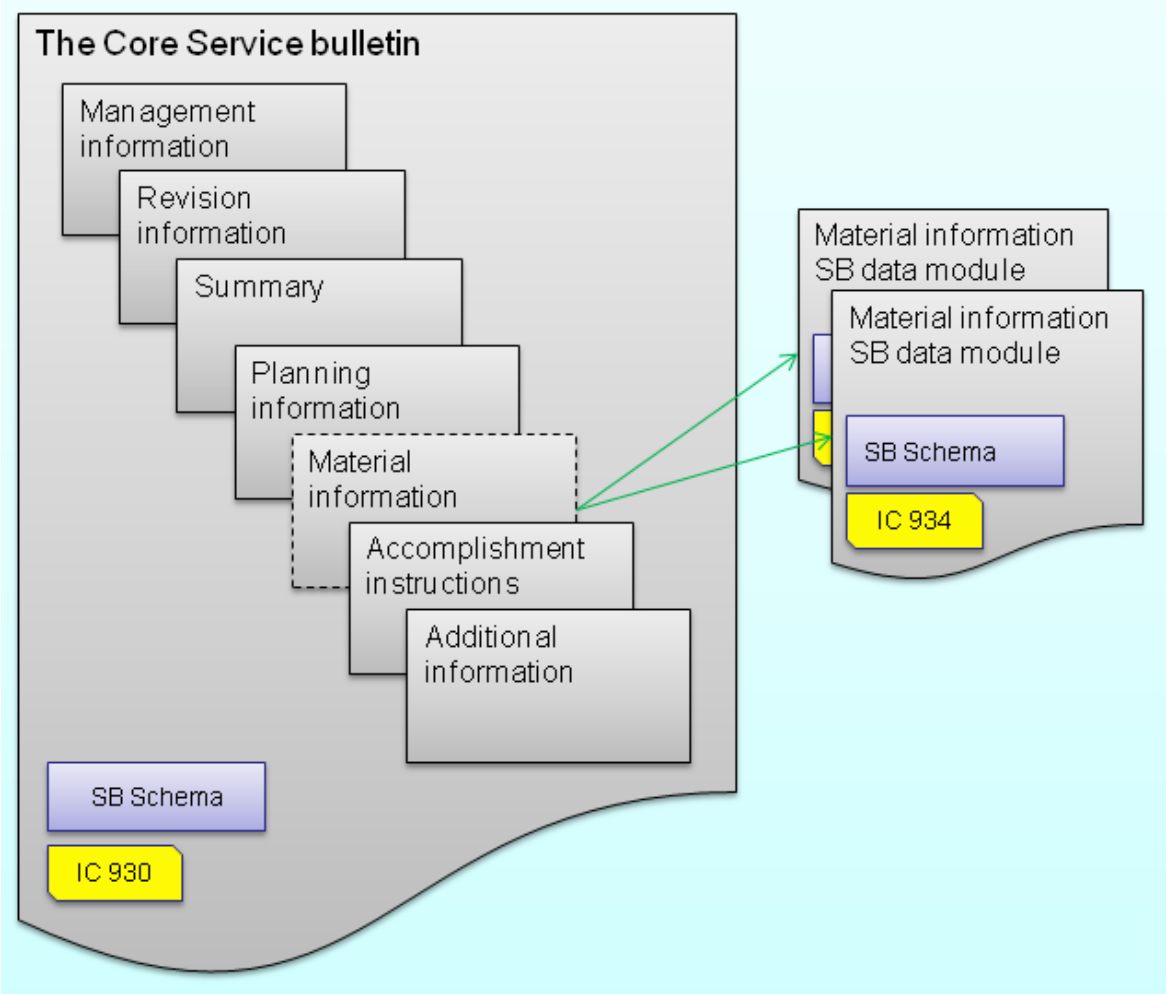
Depending on the volume of data the Material information can

- be a part of the "core" SB data module

or

- be one or more referenced separate

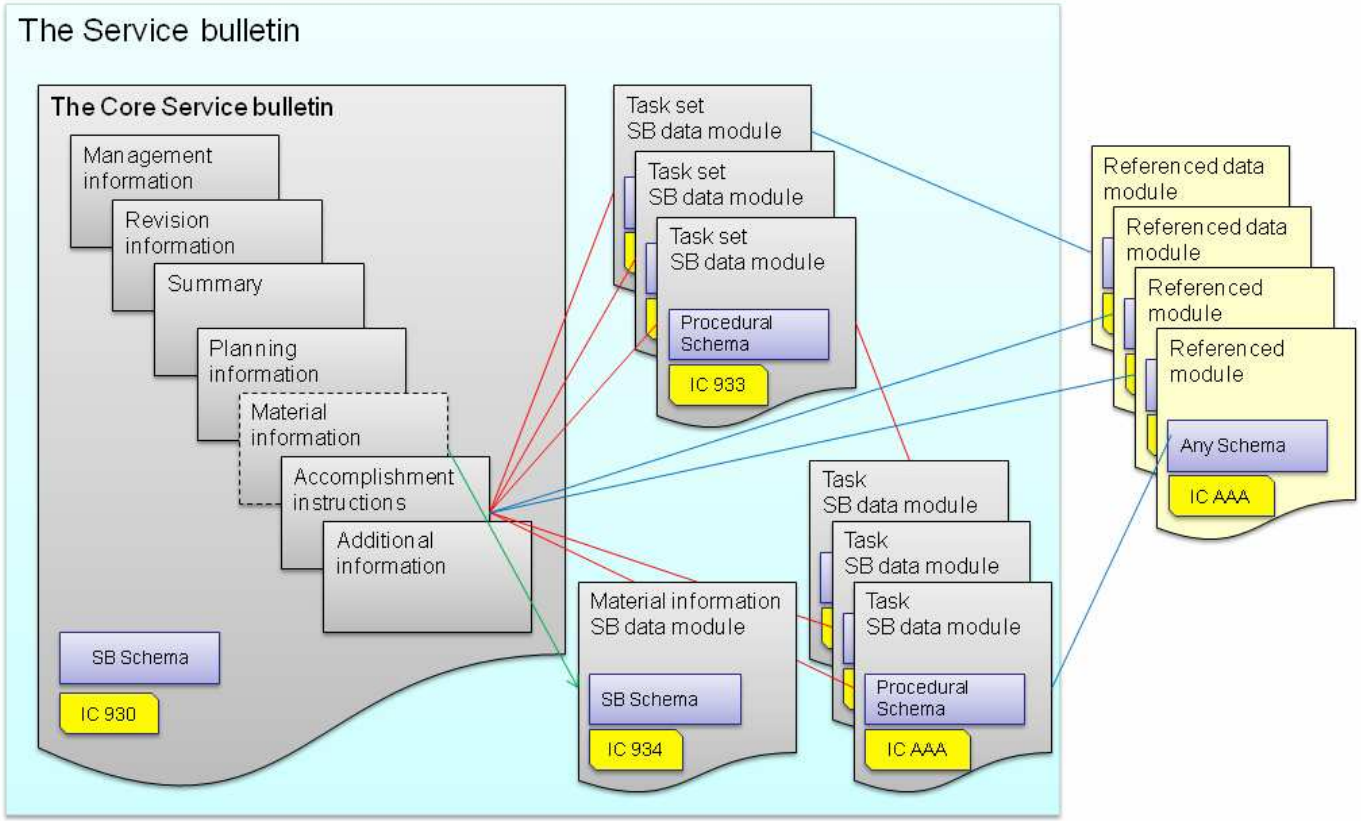
SB data module:



Service bulletins

Externalized Material information and Tasks

- To support scalability, **tasks** and **material information** can be externalized to other data modules



Service Bulletin

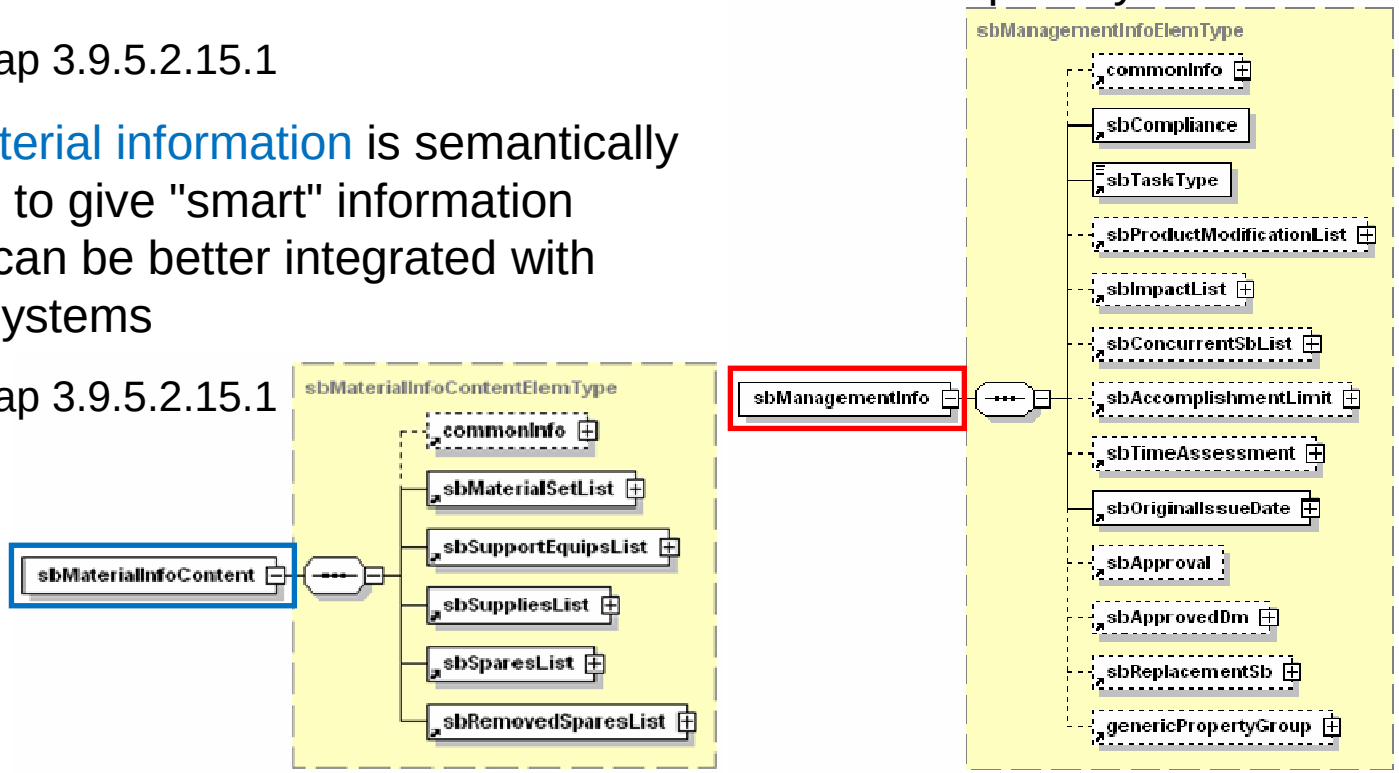
Material information

- The traditional way to deliver Material information with Service bulletins was to present the kits of parts (or bills of materials) in tables presented on paper.
  - This requires a lot of manual work by planners and engineers to make sure that all the of necessary spares, supplies and support equipment are ready when the product is scheduled for Service bulletin incorporation.
- The new Service bulletin data module type has structures specifically designed to semantically tag material information so that the information is “smart” and can be integrated with other systems.

Service bulletins

A new Schema

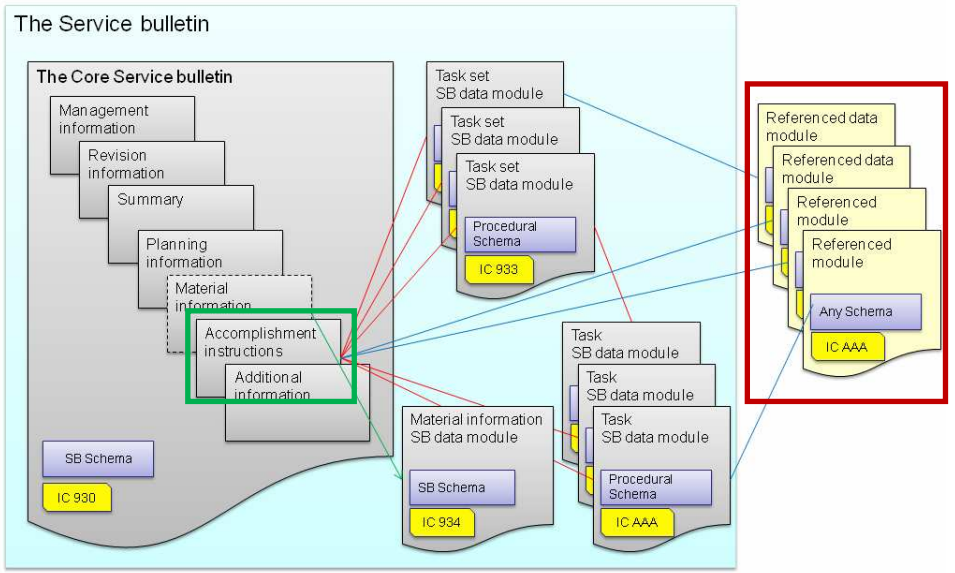
- Improve the richness of tagged data in XML delivery of service bulletins
  - SB Management information contains semantically tagged metadata about the service bulletin to allow for better search capability
    - Chap 3.9.5.2.15.1
  - SB Material information is semantically tagged to give "smart" information which can be better integrated with other systems
    - Chap 3.9.5.2.15.1



Service Bulletin

Procedural topic

- The new Service bulletin data module type has one branch for a topic that is procedural in nature. This branch uses a content model very similar to that of the procedural data module:
  - Accomplishment instructions
- Note that for complex Service bulletins the Accomplishment instructions can refer to external procedural data modules for the detailed instructions



Material information

Building blocks

- When parts are removed from the Product during Service bulletin incorporation and not reinstalled, they are tagged with metadata for:
  - reference to the replacing part (when appropriate)
  - interchangeability information relevant to the relationship between the old and new parts
  - description of the recommended disposition (discard, return to spares, etc)
  - reference to the instruction that removed it

Material information

Building blocks

- Individual spares, supplies and support equipment can be grouped into:
  - spares sets
  - supply sets
  - support equipment sets
  - removed spares sets
- These sets can be associated with metadata:
  - applicability
  - identifier
  - quantity required
  - procurement information
  - reference to the instruction that uses it

Material information

Building blocks

- When requirements and applicability are common, the spares sets, supply sets, support equipment sets and removed spares sets can be grouped into material sets which are
  - tailored to a particular instance or instances of the product
  - can have procurement information associated to support ease of procurement
  - gives one place to “look” for material information relevant to the retrofit that an operator is planning

Enhancements to Procedural data modules

- The procedural data modules will be enhanced to support the requirements of retrofit instructions:
  - Additional technical information to more precisely identify the location on the product on which the work is being done
  - Addition of tagging of parts which were removed from the product as part of the procedure
  - Allowing the SB Material information to be referenced from the preliminary requirements of a procedure
  - Allowing remarks in circuit breaker, spares, supplies and support equipment tables to be treated like footnotes

Service bulletins

General enhancements

- Correcting errors and readability problems discovered in Issues 4.0 and 4.0.1:
  - Some of the language regarding Alert service bulletins that was approved for Issue 4.0 is missing
  - The instructions in Chapter 5.2.1.16 “Common information sets - Service bulletins” for coding of data modules found in Issue 4.0.1 and earlier are incompatible with standard S1000D data module issue management
  - The language in Chapter 5.2.1.16 is confusing because it is difficult to tell if the instructions are relevant to delivering a single service bulletin or delivering collections of several Service bulletins

Service bulletins

Data module code

A new DMC (new "interpretation")

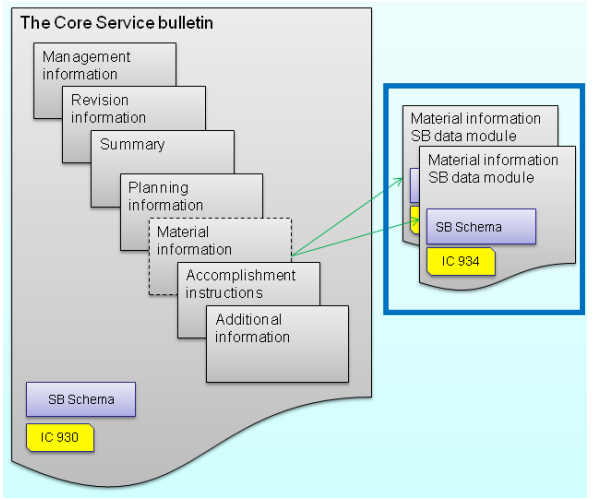
- YY-Y-**SS-SS**-**NN**-**nn**A-XXXA-Z
  - "**SS-SS**", the system-subsystem/sub-subsystem
  - "**NN**", the unit of assembly, is a sequential number starting from "01"
  - - "**nn**" is the sequential number starting from "01" for all task, task set and material information data modules "included in" the specific core service bulletin
  - XXX, the information code
    - 930 - Service bulletin core data module
    - 933 - Accomplishment procedure - **Task set** data module
    - 934 - Material information data module
    - AAA – Task SB data module where AAA can be any information code

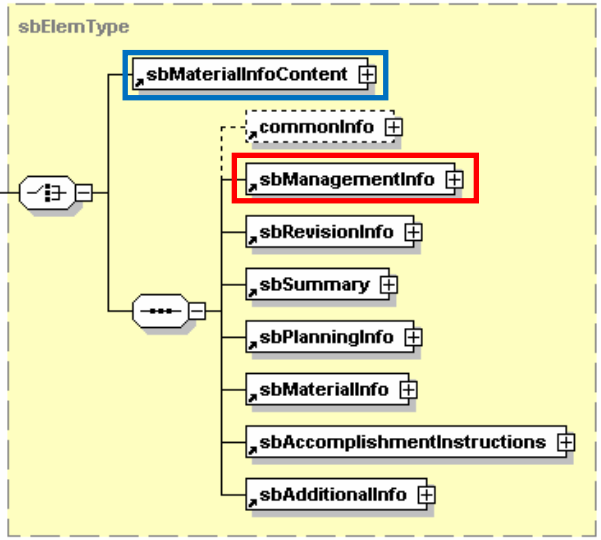
    - 931 and 932 only for SB using older issues of S1000D

Service bulletins

New chapters

- New "concept" based on civil aviation experience
  - Chap 5.2.1.16 Completely reworked
- New Schema
  - Authoring chapters added
    - Chap 3.9.5.2.15 Content section - Service bulletin data module
    - Chap 3.9.5.2.15.1 Service bulletin data module - Management information
    - Chap 3.9.5.2.15.2 Service bulletin data module - Material information





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In summary, for Issue 4.1 we are

- implementing a new Service bulletin data module type, with the ability to modularize Tasks and Material information
- improving the richness of tagged data in XML delivery of service bulletins by adding Management information (metadata) and semantically tagged Material information
- enhancing procedural data modules
- correcting errors and readability problems
- supporting Civil Aviation requirements

Questions?
Comments!?

David Nilsson

David Nilsson is an engineer at Boeing Commercial Airplanes with 23 years experience in the aviation industry, specializing in retrofit engineering, service bulletins, business systems architecture, delivery of digital data to customers and managing industry standards.

He represents the Civil Aviation industry as a Primary Representative on the S1000D Steering Committee.

He served as Chair of the ATA CAWG Service Bulletin Project Team.

He serves as Chair of the S1000D Service Bulletin Task Team.

He serves as Chair of the ATA Civil Aviation Working Group.