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Our Challenges

- ❖ *How can airlines optimize their flight operations manuals creation, management and publishing within a mixed fleet environment?*
- ❖ *Are there any differences between the needs of major and regional airlines? What are the improvement drivers and metrics for this process?*
- ❖ *This presentation will discuss how two airlines addressed these questions, and will also explore the industry's progress in standardizing electronic flight operations data through ATA Spec 2300*

Agenda



How can airlines optimize their flight operations manuals creation, management and publishing within a mixed fleet environment?



Are there differences between the needs of major and regional airlines?



What are the improvement drivers and metrics for this process?



ATA Spec 2300

How can airlines optimize their flight operations manuals creation, management and publishing within a mixed fleet environment?

You have a mixed fleet : You are like most other airlines!



	AIRBUS	BOEING	BOMBARDIER	EMBRAER
VOLUME 1	Systems Arranged by: ATA Spec	Limitations Normal Procedures Supp Procedures	Systems Arranged by: Alphabetic	General Limitations Emerg Abnormal Normal Proc Performance Flight Planning Weight and Balance Loading Config Dev List Min Equip List Emerg Info Emergency Evac Quid Servicing
VOLUME 2	Loading T O Perf Land Perform Special Ops Flight Planning	Systems Arranged by: Alphabetic	Limitations Checklists Normal Ops Supp Procedures Emergency Abnormal Performance Spec Ops In Flight Checks	Systems Arranged by: Chronological Use
VOLUME 3 & 4	Limitations Abnormal Std Oper Proc Supp Techniques In Flight Performance Engine Out Ops FNO's Volume			
QRH	Emergency Abnormal	ALL Non-normal ALL Performance	Warnings Cautions	Normals Section Abnormal Emergency Cautions
FORMAT	HTML w/ FrameMaker CD-ROM (html) Paper	Some HTML FrameMaker, Word PDF Paper	Quickilver / (Interleaf) Paper	Word, PDF Paper
PAGE	5.83 x 8.27 (A5)	5.5 x 8.5	8.5 x 11	5.5 x 8.5



How can airlines optimize their flight operations manuals creation, management and publishing within a mixed fleet environment?

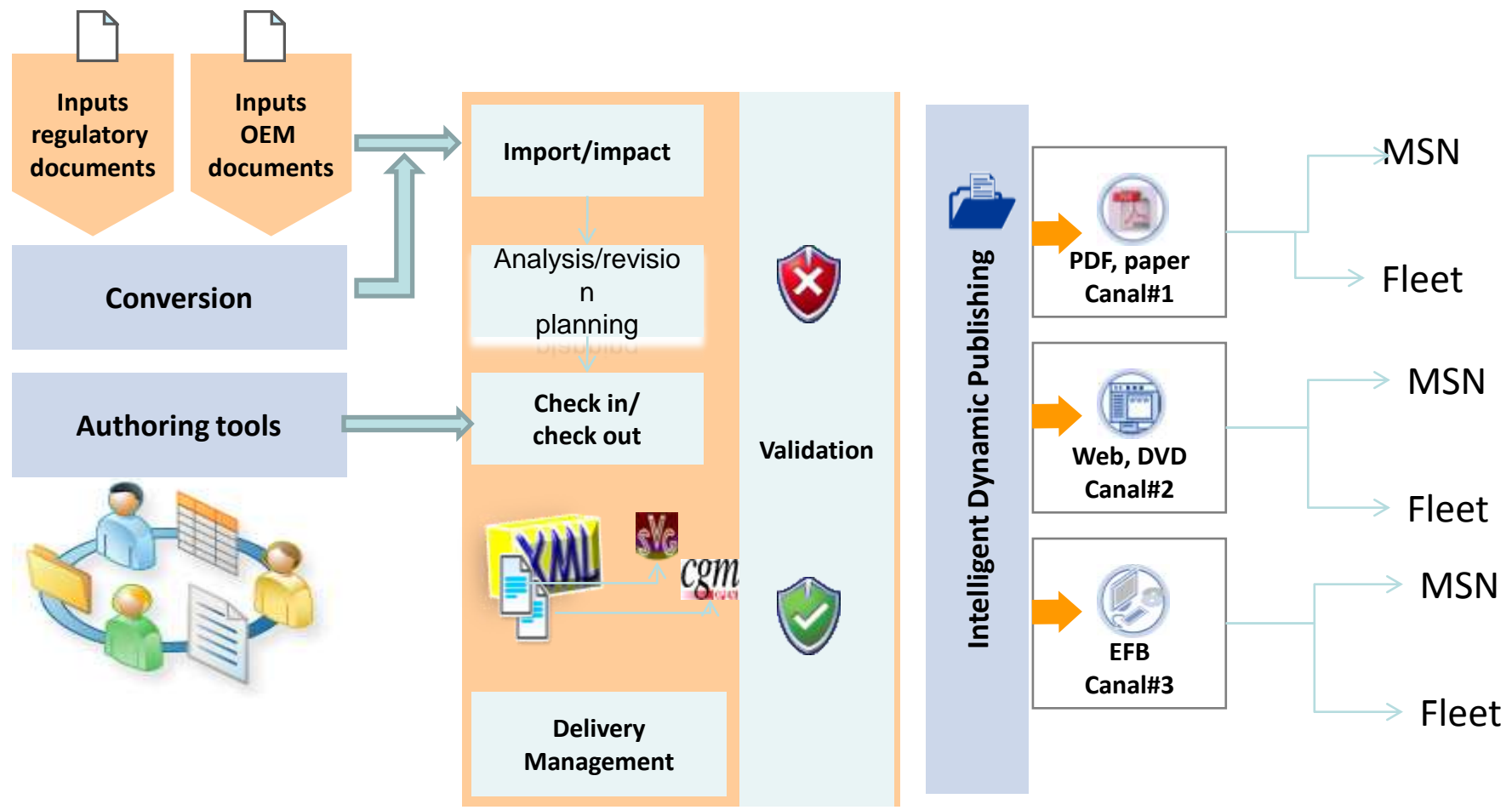
FOIG until recently did not offer more than a limited standard for A/C system numbering, Phase of Flight Specification and XML as core technology : so ATA messages about standards are not strong enough.

Thus you must sell your project not only to your pilots and authors but also justify this investment to your management :

- **Standard structure of manuals increases user acceptance of information**
- **Standard location of information between fleets for users transitioning between aircraft types**
- **Mental Model of information is enhanced in company procedures and policies**
- **EFB project in addition to web portal and PDF**
- **A/C specific manuals on-board**
- **Reinforce information completeness and consistency**
- **Quicker revision cycle and safer distribution**
- **Better multilanguage management**

How can airlines optimize their flight operations manuals creation, management and publishing within a mixed fleet environment?

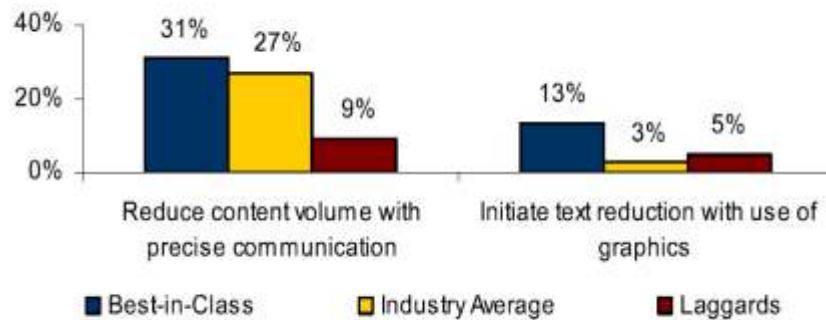
What do we have to do ? Where does it hurt ?



How can airlines optimize their flight operations manuals creation, management and publishing within a mixed fleet environment?

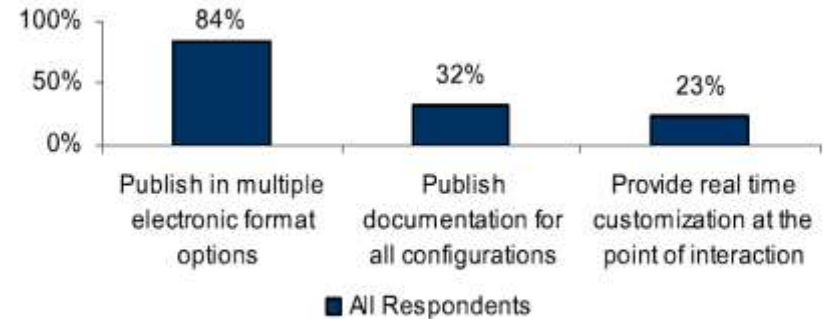
Can we learn from other industries ?

Figure 4: Top Actions of the Best-in-Class



Source: Aberdeen Group December 2007

Figure 3: Top Actions for All Respondents



Source: Aberdeen Group, December 2007

Pressures	Actions	Capabilities	Enablers
<ul style="list-style-type: none"> Shorter documentation development schedules 	<ul style="list-style-type: none"> Publish in multiple delivery formats (paper, electronic, and web) Provide real time customization at the point of interaction 	<ul style="list-style-type: none"> Single source authoring of documentation Inclusion of interactive 3D graphics and emulations into documentation Integration of documentation with data sources and product data management systems Outsourcing localization while capturing localization configuration logic Automated publication of documentation through captured logic 	<ul style="list-style-type: none"> Structured authoring applications Content management systems Integration of structured authoring applications and content management systems

Source: Aberdeen Group, December 2007

How can airlines optimize their flight operations manuals creation, management and publishing within a mixed fleet environment?

Air France Case

ATA approved standard in 2005 for FOPS docs :

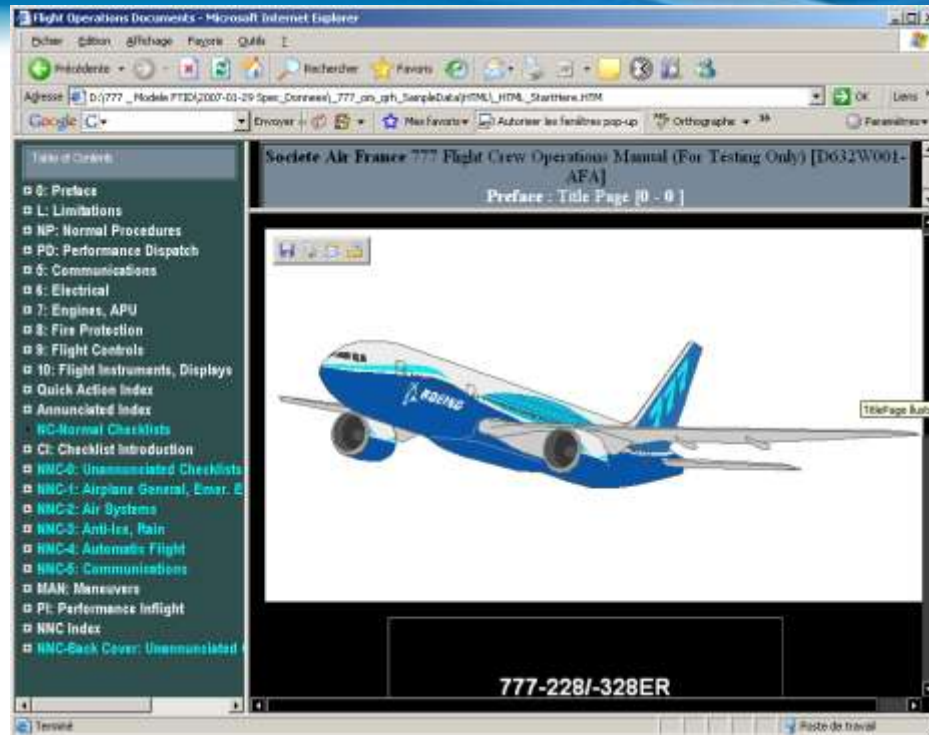


Air France stating the lack of approved standard , use primarily Airbus A380 XML schema and derived to accomodate not only the rest of the Airbus fleet e.g. A320/30/40 the Boeing Fleetin peculiar 777 or 747. This is a way to reduce the technology gap accross the fleet. A single system designed for a mixed fleet environment will produce the whole documentation consistent with the ATA vision.

The goals are to support both a English and French version to output in PDF, to the AF web portal and on EFB regardless the aircraft type but above all to be driven by operational efficiencies goals and by the use of XML (flexibility, stability). The revision must be incremental regardless the output format.

There is a double challenge : the adoption by Pilots and Authors. The project must be strongly supported and the adoption must be well prepared.

Air France Case



Kinds of Documents published

- **Manex A = General documents for the complete fleet: GENOPS, MAC, IAC,**
- **Manex B = Technical airplane documents: TU Description, MEL, QRH, ...**
- **Manex C = Training documents**

Volumes and quantities

- **Manex A and B represent 20,000 pages**
- **With MADERE, updates will be in electronic format for most of manuals except for the commercial crew, corresponding to former 24,000,000 annually printed pages to be delivered**

How can airlines optimize their flight operations manuals creation, management and publishing within a mixed fleet environment?

Britair Case

ATA approved standard in 2006 for FOPS docs : **£**

End of 2006 : Britair, stating the availability of a preliminary but restricted in scope standard from ATA and the lack of XML delivery from its OEM's, decided to derive the ATA draft available at this time to make it semantically rich to ensure the best potential use in a EFB context . The goals are to reduce the effort to produce better quality, ease the compliance task.

The ATA vocabulary has been used (MU,PS,UI) and associated data management implemented.

Kinds of Documents published

- Flight Ops exploitation manual in three parts: A (general / basic), B (aeroplane operating matters, QRH, MEL, CDL) one for Fokker and another one for CRJ 100 & 700 and C (route and aerodrome instructions and information)

Volumes and quantities

- 10,000 pages (paper) of which 6,000 in PDF and 4,000 in Word format (converted into 7,500 information units). About 1,000 images
- Min. 700 users: flight and cabin crew

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Are there differences between the needs of major and regional airlines?

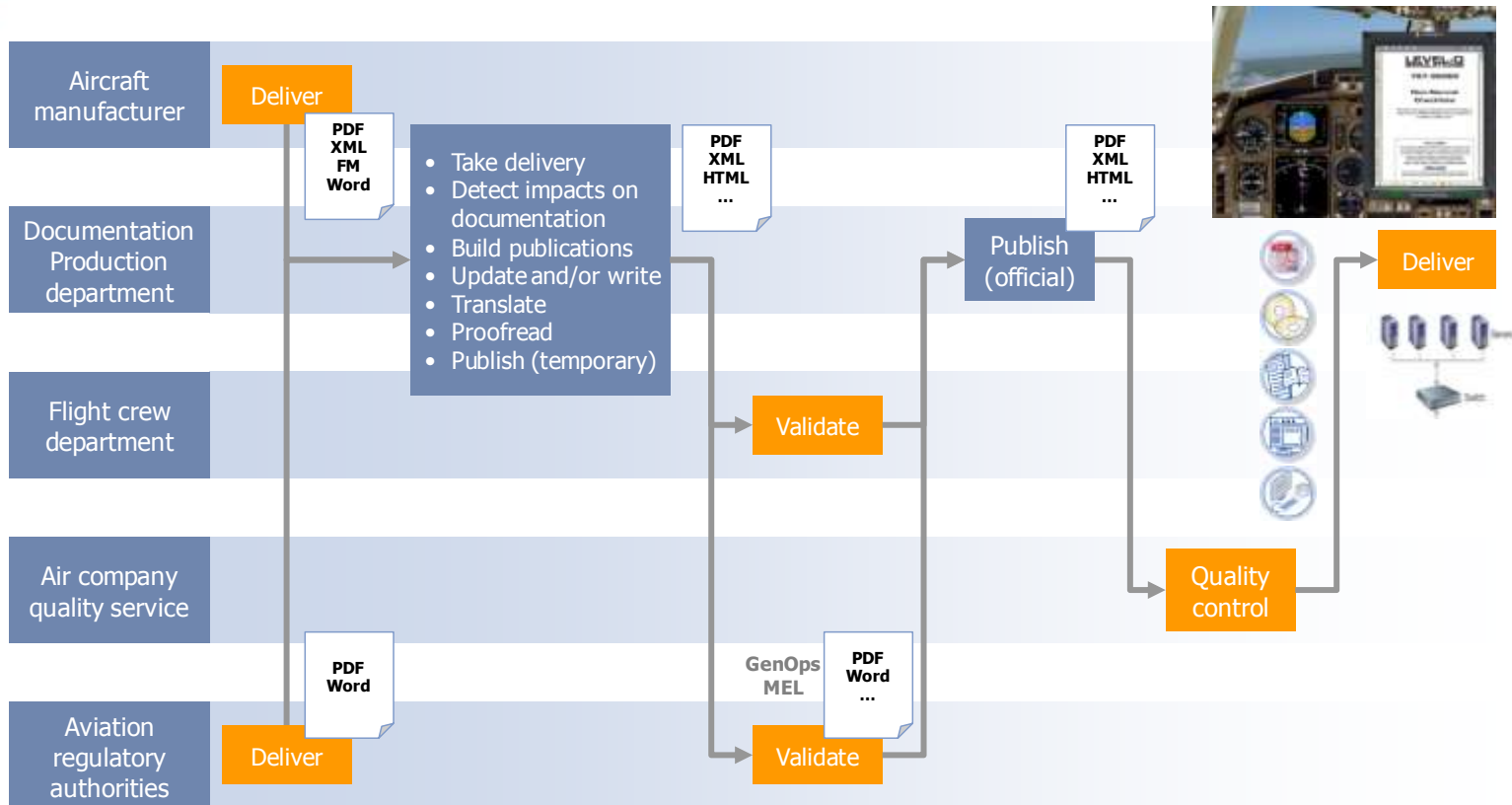


What are the improvement drivers and metrics for this process?



ATA Spec 2300

Are there differences between the needs of major and regional airlines?



How can airlines optimize their flight operations manuals creation, management and publishing within a mixed fleet environment?

Major Carrier  Regional carrier

At the end of the day , the difference is very limited because :

- **the project goals are the same,**
- **the business pragmatic vision applies (same strategic objectives, same regulation, same cost conscious approach, Fleet vision)**
- **The volume of document involved is only dependent on the number of fleets not on the number of airplanes**

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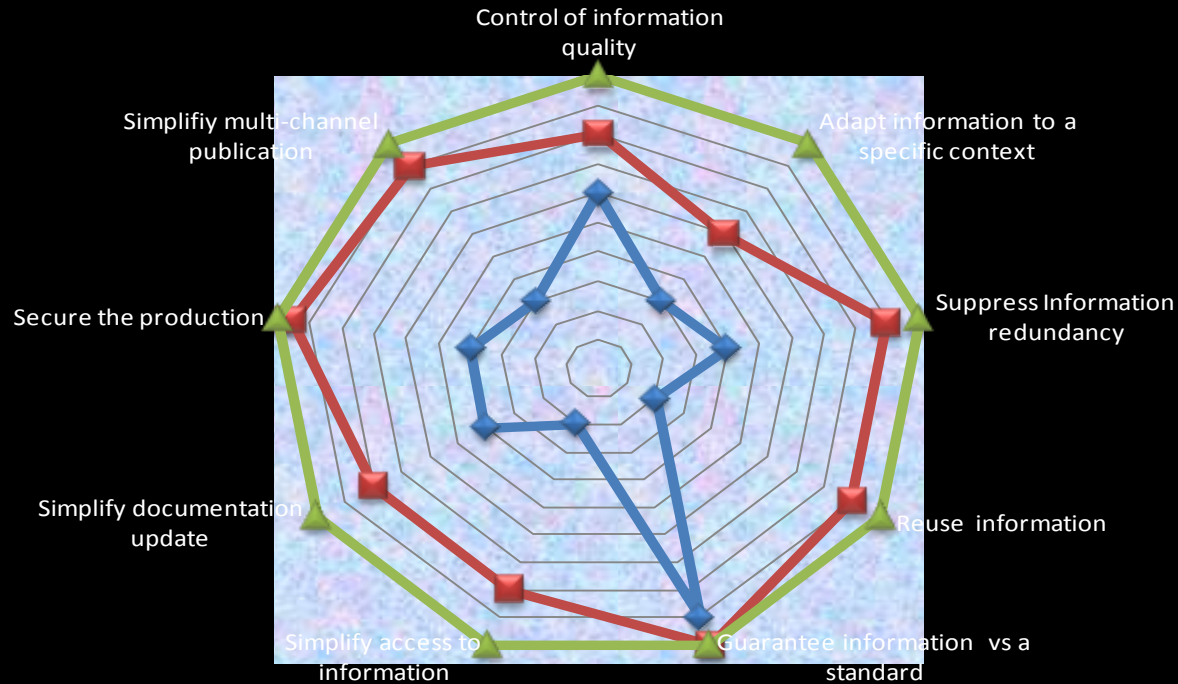


ATA Spec 2300

What are the improvement drivers and metrics for this process?

ROI DRIVERS WEB

—◆— PRE PROJECT —■— POST PROJECT —▲— ATA 2300 GOALS



Agenda



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Are there differences between the needs of major and regional airlines?



What are the improvement drivers and metrics for this process?



ATA Spec 2300

Latest Announcement!

ATA Specification 2300

Data Exchange Standard for Flight Operations

Draft version 0.1

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- **ATA Spec 2300 is the newest Data Exchange Specification for Flight Operations data**
- **Draft version 0.1 has been approved this year for information and testing purposes**
- **The Spec has been the work of the ATA Flight Operations Interest Group (FOIG) with participants from the ATA, OEMs, Airlines and software vendors**
- **The Spec and all related materials are available on the ATA FOIG Website (<http://www.ataebiz.org/apps/org/workgroup/foig/>)**
- **This presentation is to provide you with an overview of the Spec**

Highlights In This Section

- **Background Information**
- **FOIG Purpose, Objectives and Scope**
- **What Is In the ATA Spec 2300?**
- **Flight Operations Markup Language**
- **Other Related Standards**
 - **Flight Operations Standard Numbering System**
 - **Phase Of Flight**
- **Benefits**

Background Information

- **Flight Operations domain had never really had an industry specification**
- **The original SGML DTD in iSpec2200 was not fully developed and well accepted. The S1000D crew module was not adequate**
- **FOIG had a few “false” starts and incomplete work in the past**
- **Current FOIG project was re-energized in early 2006, utilizing the experiences that had been developed before, while stay informed with the recent S1000D development**
- **The team adopted a new approach and followed rigorous process to define data requirements, data model, schema design and development, data population, testing, group review and documentation**
- **The current work is focused on the Systems Description area, while the goal is to complete all data areas**
- **Long term, ATA Spec 2300 will be aligned with the S1000D Specification**

FOIG Purpose

To provide a forum for exchanging ideas, discussing challenges, recommending enhancements and developing aviation industry consensus for electronic flight operational data exchange specifications

Objectives and Scope

- **Main objectives are:**
 - Based on non-proprietary standards (i.e. XML)
 - Data-centric approach with reusable data modules
 - Unique and persistent data identification
 - Single and consistent data population by all OEMs
 - Facilitate data revision and re-authoring management
 - Enable configuration and applicability of the information for specific aircraft or fleets
 - Facilitate different uses of the data for different audiences
- **Scope includes Flight Operations data such as:**
 - Systems Description
 - Procedures – Normal, Non-Normal, Supplementary
 - Performance
 - Limitation
 - Dispatchability - MEL

FOIG Team

- **Active team members consist of:**
 - Chair – Jason Bialek (Boeing)
 - Co-Chair – Terrie Parsons (Continental Airlines)
 - Administrator – Paul Conn (ATA)
 - Schema Author – Hung Truong (Boeing)
 - OEM participants from Boeing, Airbus, Bombardier, Embraer and Jeppesen
 - Airlines participants from Air Canada, Continental, Northwest
- **The team meets in person every few months, but not more than four times a year**
- **Web and phone conferences are held regularly to monitor and progress the work between face-to-face meetings**
- **Members are assigned action items to work between conferences**
- **New participants are needed and always welcome!**

What Is In the ATA Spec 2300?

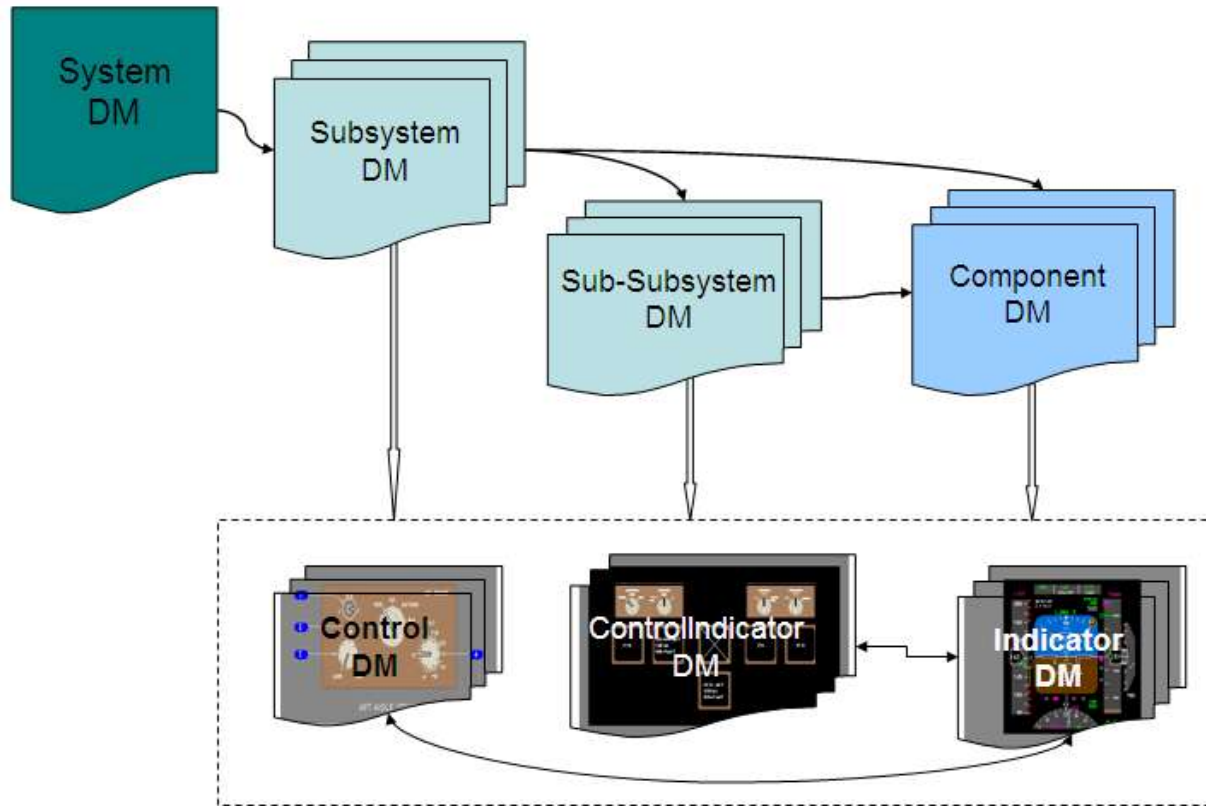
- **The main ATA Spec 2300 document consists of these major items:**
 - Introduction, scope and benefits
 - Phase of Flight Specification
 - FO Standard Numbering System
 - FO Information Management
 - FO Information Types (i.e. Systems Description)
 - DMC and ICN (incorporated from S1000D)
 - FOML – Flight Operations Markup Language
- **Support materials include:**
 - **FOML XML Schema Modules**
 - **Data Authoring Guide**
 - **Data Model Diagrams**
- **Other working materials are also available on the ATA FOIG Website**

What Does ATA Spec 2300 Data-Centric Mean?

- **Spec 2300 is more than just a Data Exchange Standard!**
- **The Data-Centric approach, in short, defines what the data really is, not limited by the documentation that it is published in**
- **Each data module is specifically defined not only for its precise structure, but also for its relationship to other data modules**
- **Each data module is identified with a Data Module Code which follows the FO Standard Numbering System. Phase of Flight will be assigned where applicable**
- **Instead of an XML Schema for the FCOM, there is a series of schemas for different data types within the FCOM and other related documents**
- **Spec 2300 allows the exchange of the data modules and their metadata to enable the OEMs or airline operators to build their own products whenever they want**
- **Preserve the longevity of the data as technology changes!**

Data Module Relationship

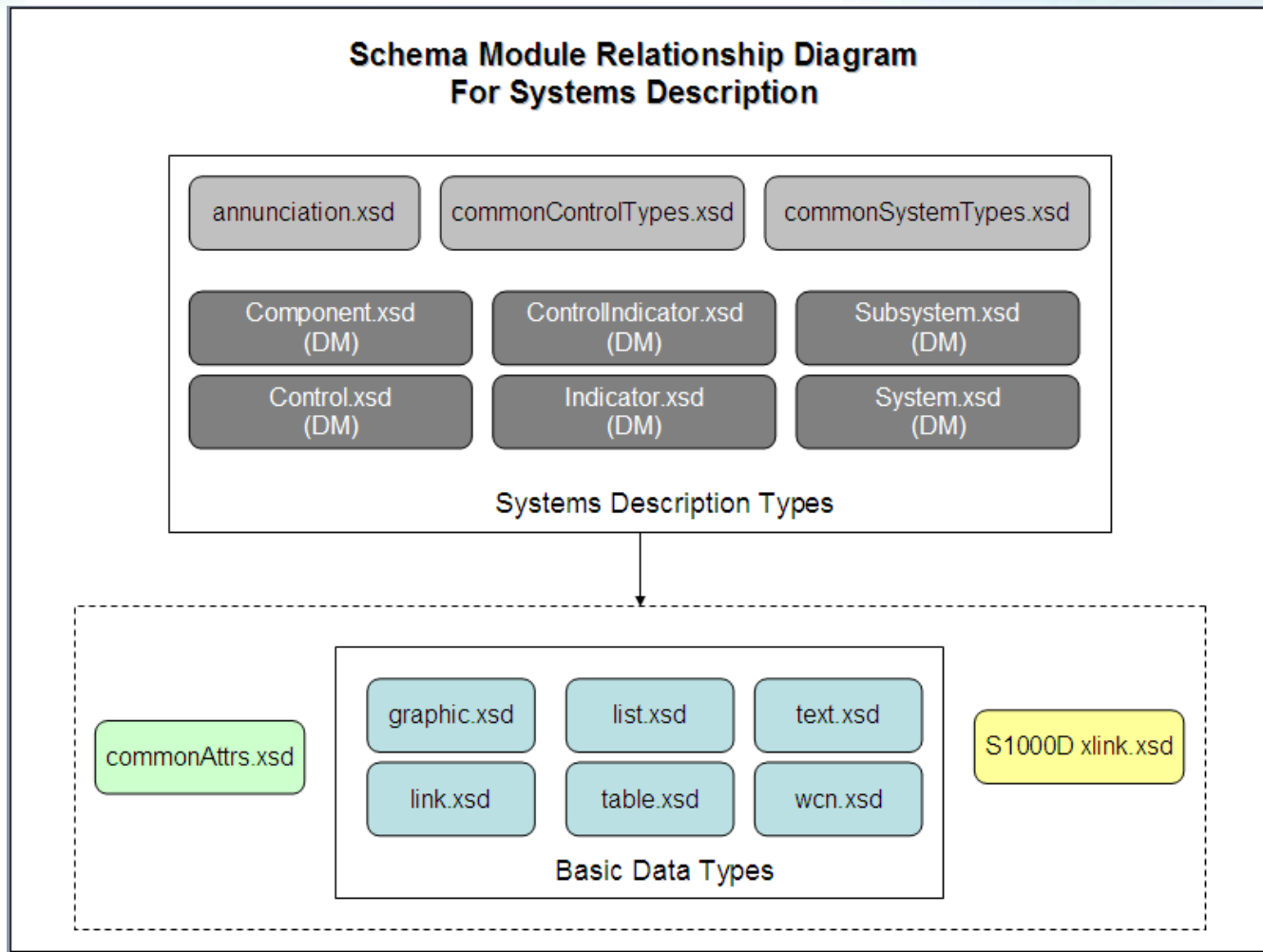
Data Module Relationship Diagram For Systems Description



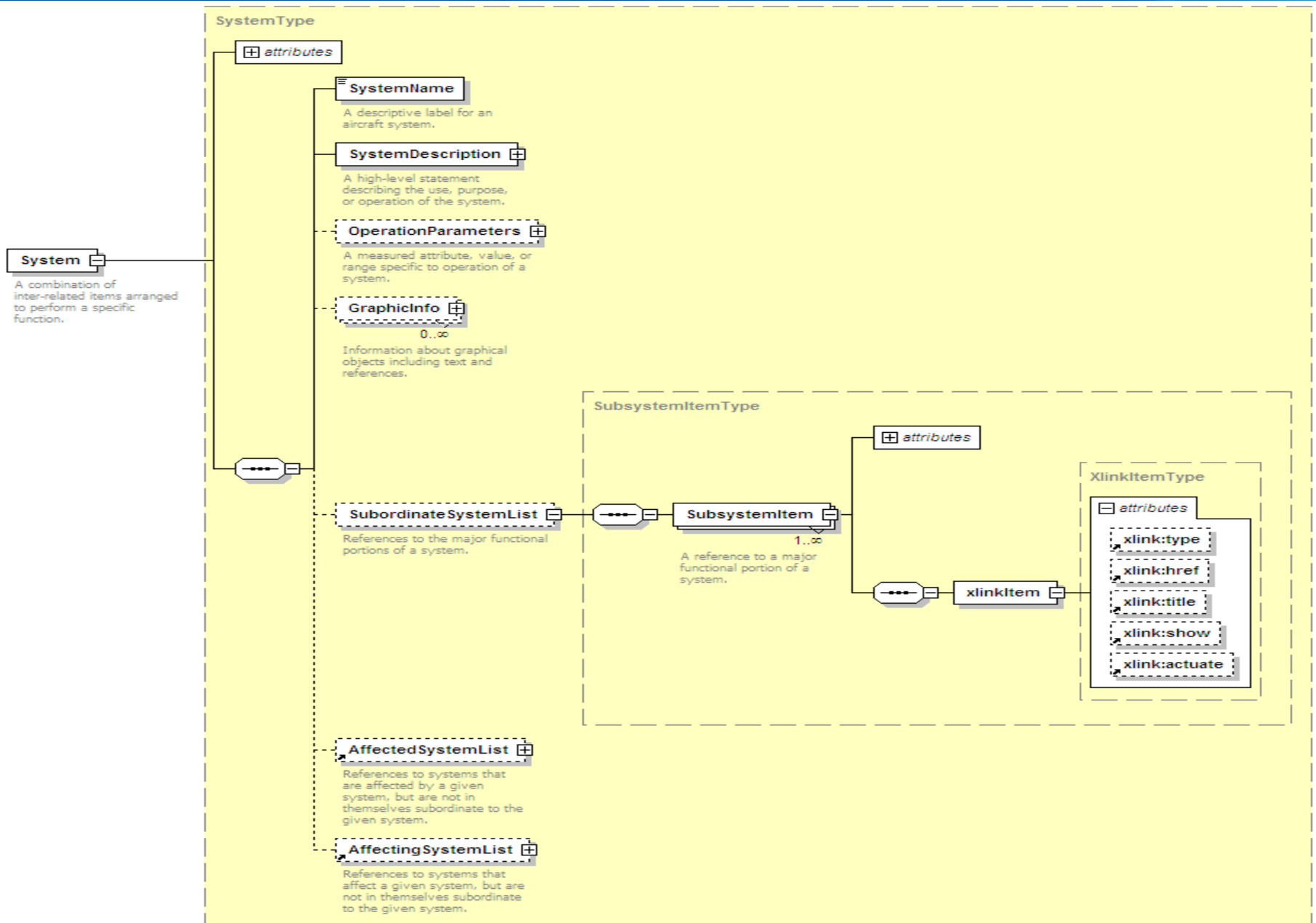
FOML – Flight Operations Markup Language

- **FOML is the standard markup language for Flight Operations data**
- **FOML is based on the W3C XML Schema Language**
- **FOML defines the data vocabulary, structures and relationship**
- **FOML follows consistent naming convention and best practices**
- **FOML consists of a series of highly modularized schema modules for consistency, reusability and extensibility**
- **Current FOML (version 0.1) is focused on the Systems Description area which consists of:**
 - Six data module schemas
 - Schema hierarchy follows the ATA System breakdown
 - Each schema defines its own data type, while sharing any other schema modules as applicable
 - Each schema's relationship to other data modules are well established and defined using XLink attributes as specified in the S1000D Spec
 - Being expanded to incorporate more dynamic relationship and more interactive accesses among data modules
- **Other data areas such as Procedures, Performance, etc. are to be developed**

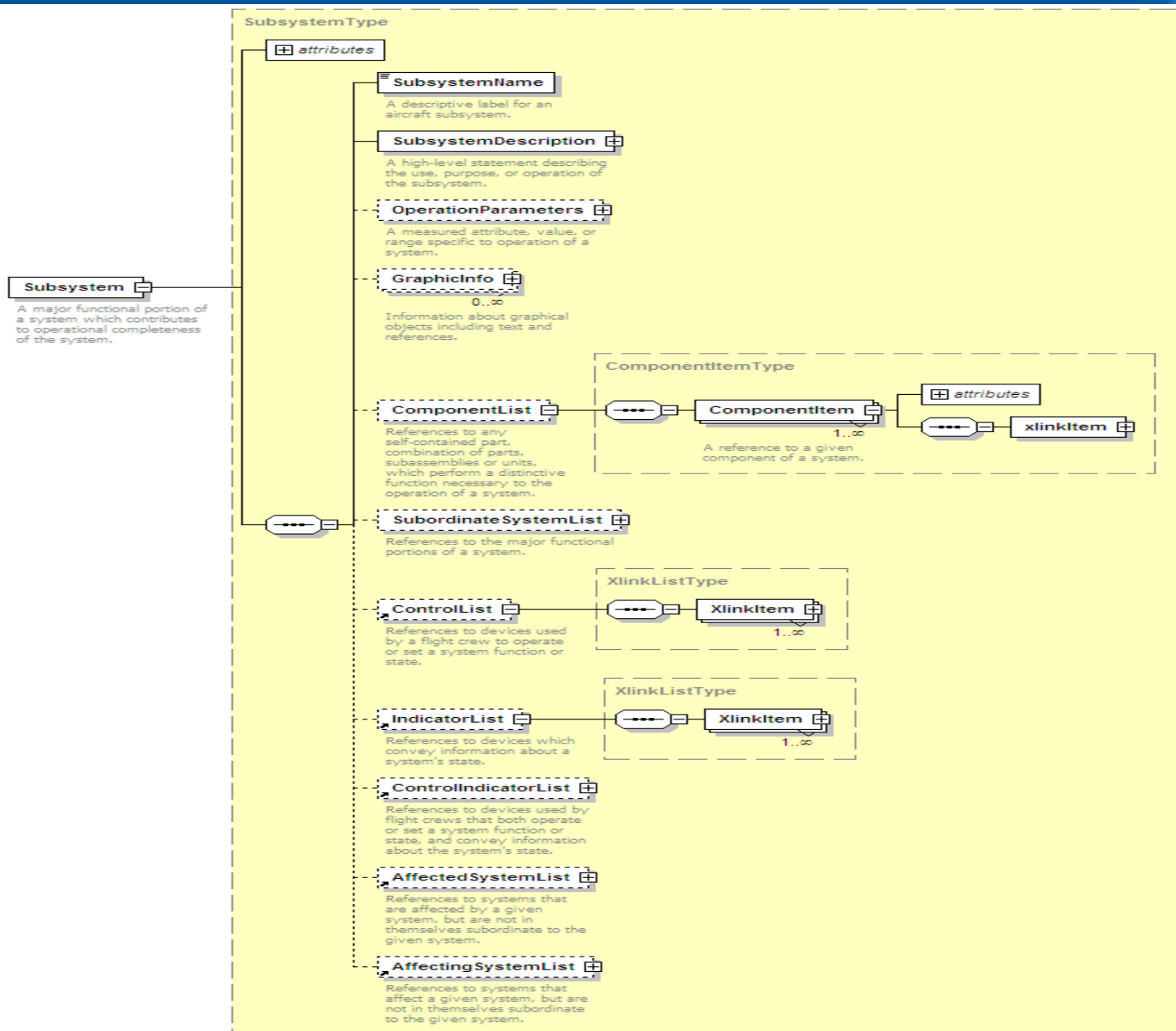
Schema Module Hierarchy and Relationship



XML Schema For the System DM

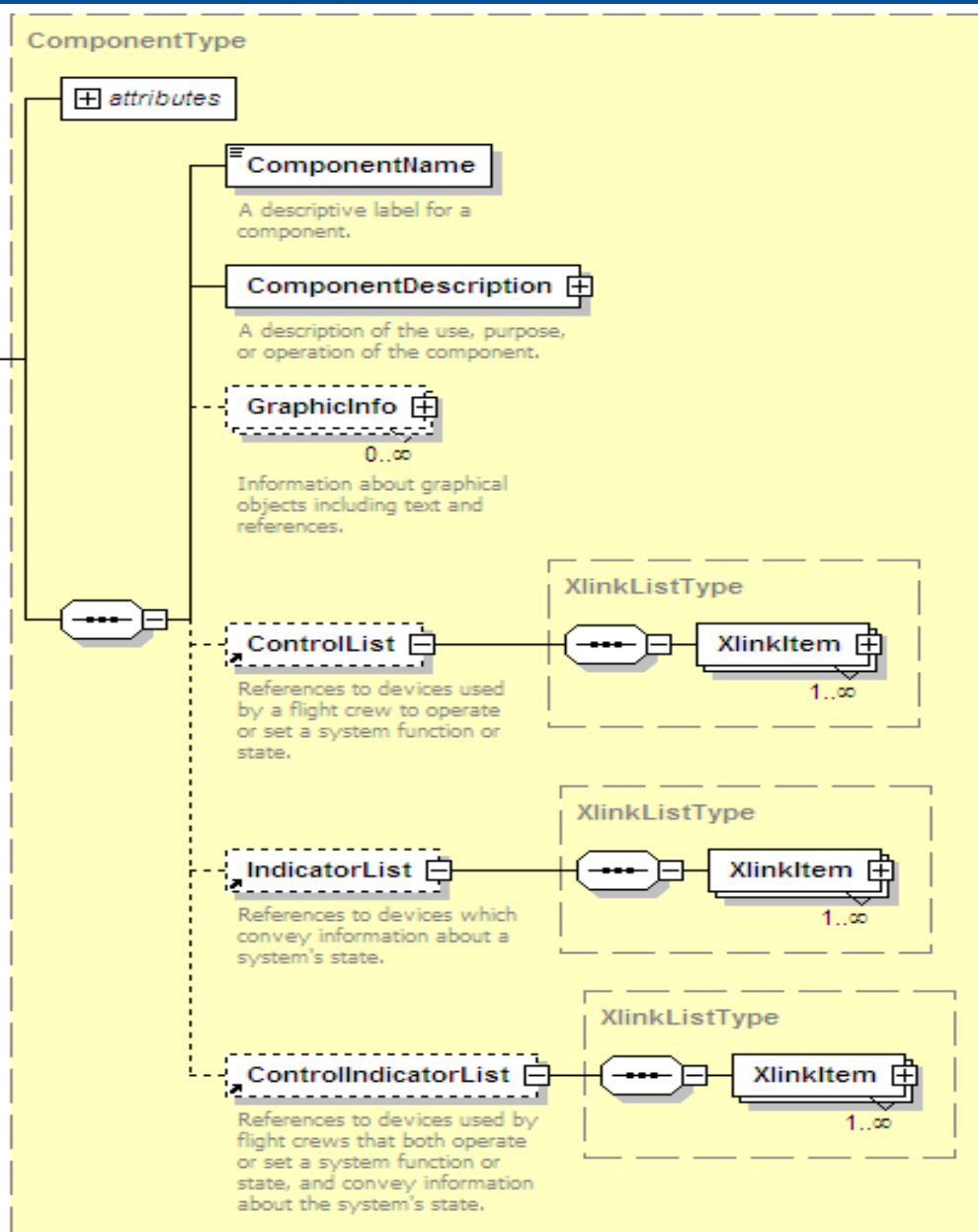


XML Schema For the Subsystem DM

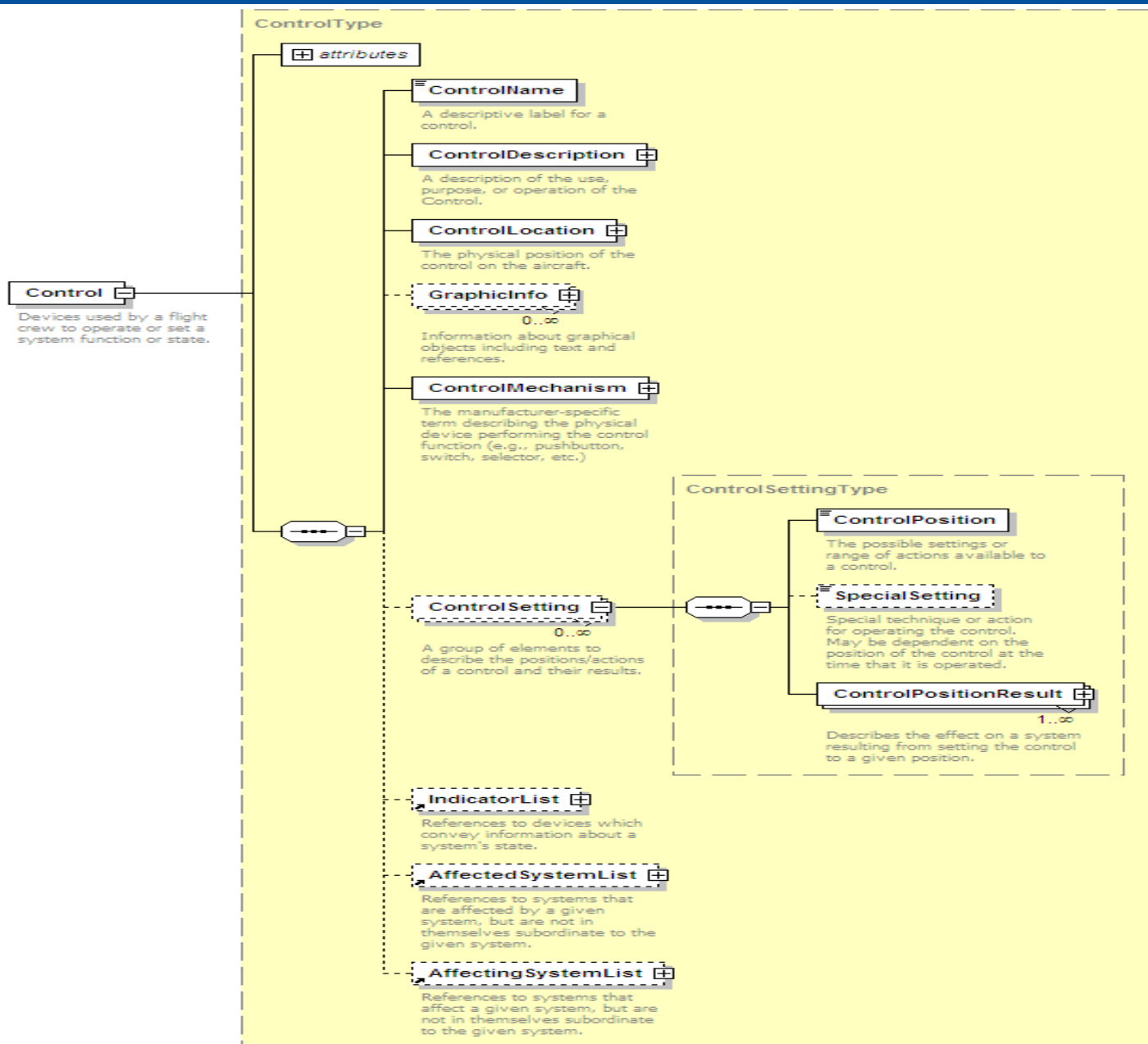


XML Schema For the Component DM

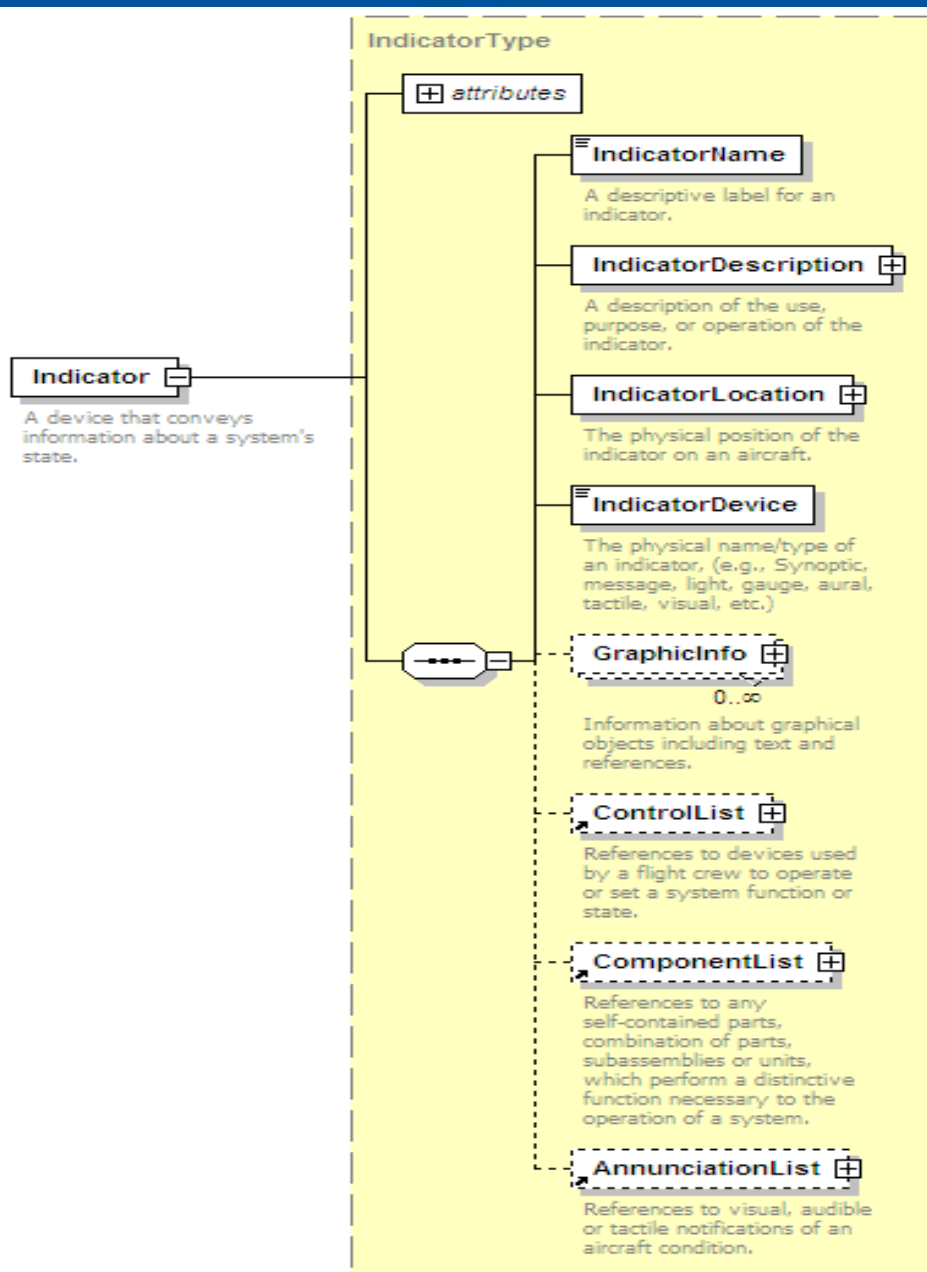
Component
Any self-contained part, combination of parts, subassemblies or units, which perform a distinctive function necessary to the operation of a system.



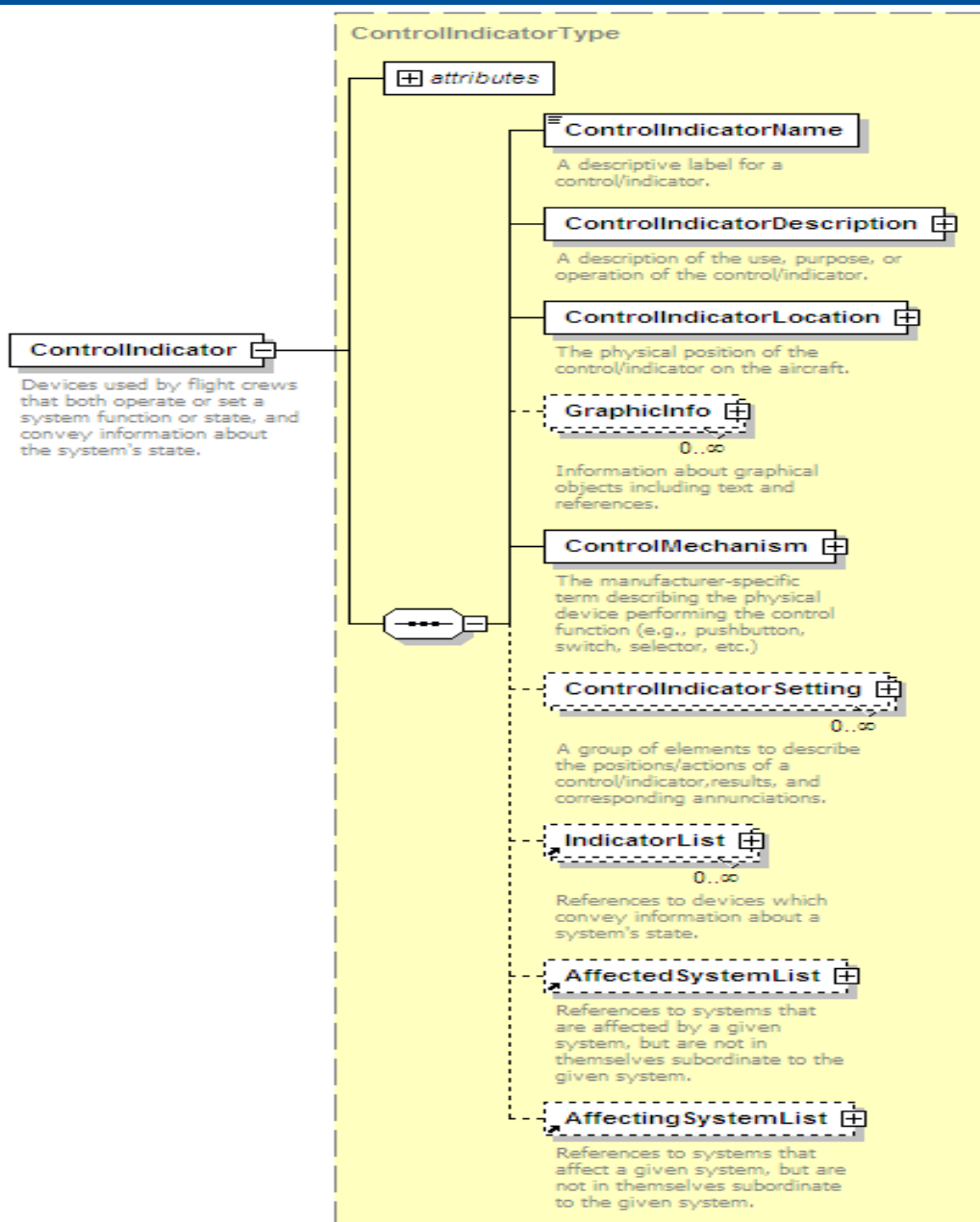
XML Schema For the Control DM



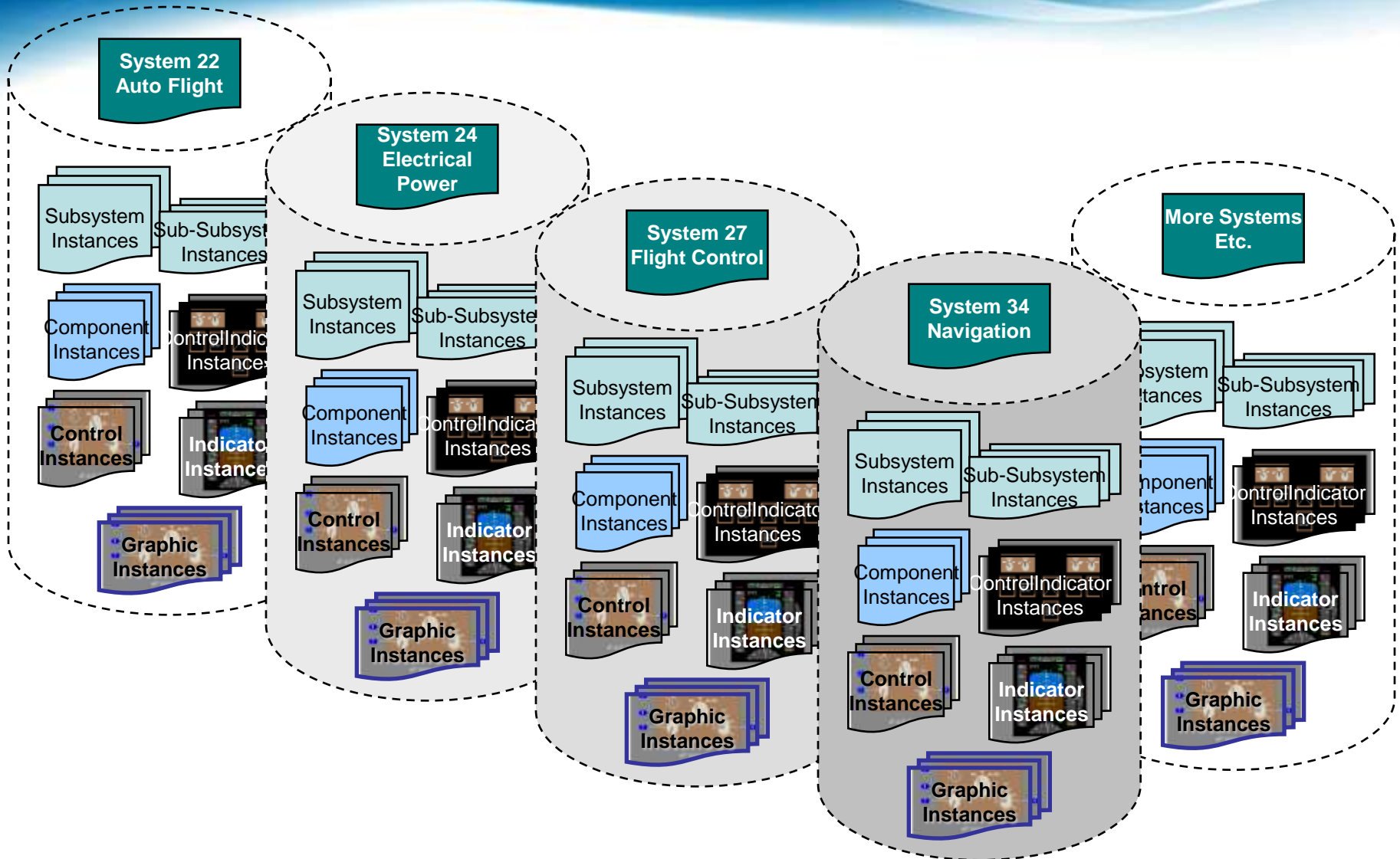
XML Schema For the Indicator DM



XML Schema For the ControllIndicator DM



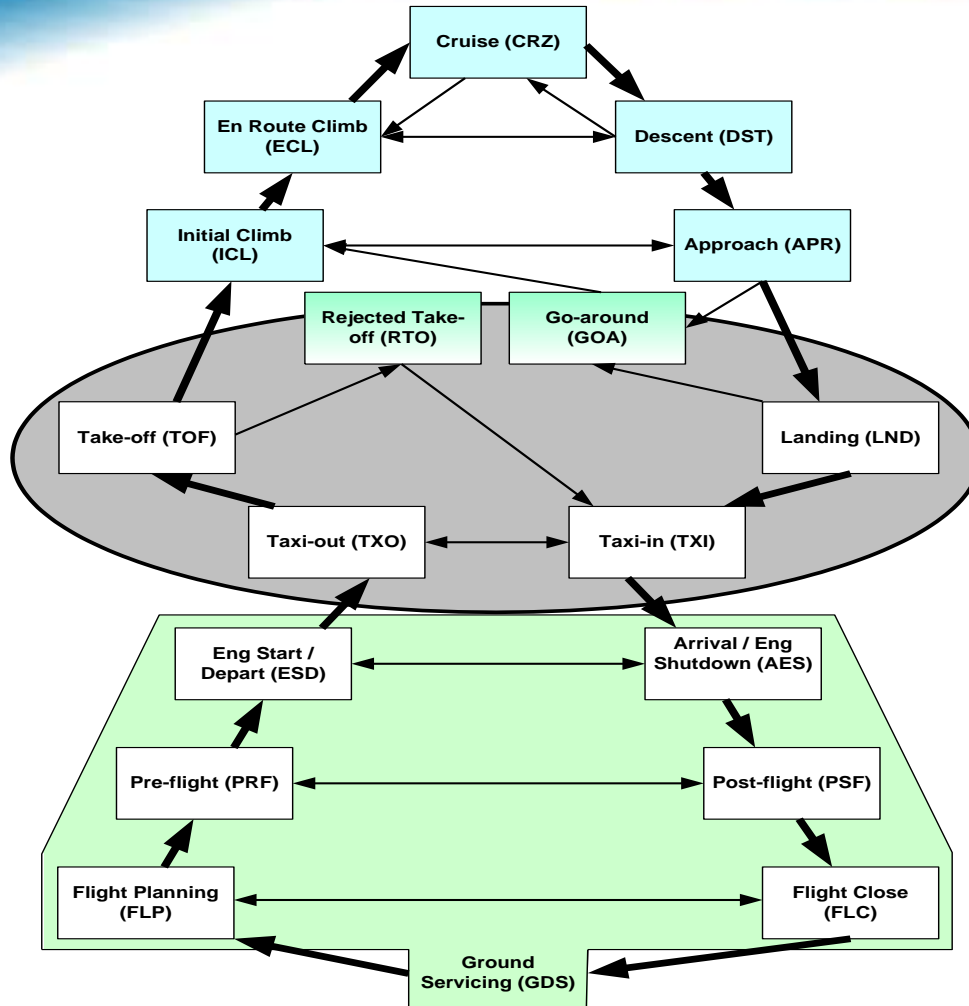
Sample Data Module Instances From Systems Description



ATA Flight Operations Standard Numbering System

- **Flight Operations SNS is not a new and separate numbering system, but follows the same ATA and S1000D numbering systems and adapts for Flight Operations data:**
 - **Maintain current ATA SNS numbering scheme at the chapter level and wherever else it is possible**
 - **Align better with the S1000D system/subsystem structure**
 - **Eliminate references to maintenance only**
 - **Change some subchapter nomenclature and definitions to make the SNS much more usable for Flight Operations**
- **Flight Operations SNS is used in the DMC and ICN, similar to the S1000D convention for data identification and organization**
- **ATA Spec 2300 has a complete list of Flight Operations Systems, Subsystems and their definitions**
- ***The work in this area is still being finalized***

Phase of Flight Specification



- This Spec is not new, but has been in the ATA family of Specs
- It is being incorporated into the new ATA Spec 2300
- FOML will be incorporating POF systematically where applicable

Anticipated Benefits

- **Standardization of the data from all OEMs, not just in terms of following the same structures (i.e. Schemas), but the information will be consistently authored, organized and exchanged**
- **Enable the use of the same authoring and publishing system, particularly for the mixed fleets operators**
 - Reduce the cost on technology investment
 - Enable vendors to compete and provide standard solutions
 - Create efficiency by reducing duplicate processes
 - Eliminate data transformation between different OEM specifications
 - Reduce vendor or IT support
 - Overall cost savings with respect to system maintenance, upgrade, training, etc.

Anticipated Benefits (cont.)

- **Enable a truly single-source and data-centric authoring and publishing environment**
 - Automate the data exchange process with OEMs or other airline operators to manage one's own revisions
 - Author the data, not the output product
 - Eliminate data duplication by re-using the content
 - Data linking is “built-in” through the defined data relationship
 - Automate the publishing process and efficiently produce different products and output formats including paper
 - Enable the development of new software applications to enhance user experiences with the new data through electronic interaction and EFB deployment



Thank you for your attention.