ATA Spec 2500

Aircraft Transfer Records

Revision 2017.2

2500

ATA e-BUSINESS PROGRAM

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Aircraft Transfer Records

Revision 2017.2

ATA e-BUSINESS PROGRAM

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USA

http://www.ataebiz.org

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Table of Contents

Spec 2500 Title Page . . . 1
PRODUCT LICENSE AGREEMENT . . . 2
Important Information About This Document . . . 5
Table of Contents . . . 6
Chapter 1. Overview . . . 7
1-1. Purpose . . . 7
1-2. General Description . . . 7
1-3. Benefits . . . 7
1-4. Scope . . . 8
1-5. Regulatory Impact . . . 8
1-6. Digital Security . . . 9
Chapter 2. General XML Guidance . . . 10
2-1. Documenting and Organizing the XML Schema . . . 10
2-2. Versioning and Validating the XML Schema . . . 11
2-3. XML Schema Illustration Convention . . . 12
2-4. XML Data Types . . . 13
2-4-1. date . . . 13
2-4-2. dataTime . . . 13
2-4-3. duration . . . 13
Chapter 3. Common Data Types . . . 14
3-1. General Description . . . 14
3-2. Common Types Descriptions . . . 14
3-3. Common Types Schema Diagrams . . . 14
3-4. Common Types XML ElementTables . . . 23
Chapter 4. ATA_AircraftTransferRecordsCrate . . . 38
4-1. General Description . . . 38
4-2. ATA_AircraftTransferRecordsCrate Data Structure . . . 38
4-3. Crate XML Schema Diagram . . . 40
4-4. Crate XML Element Table . . . 40
4-5. Crate Additional Implementation Details . . . 47
4-5-1. General Overview . . . 47
4-5-2. Content Carried Within the Crate . . . 47
4-5-3. Content Abstracted from the Crate . . . 47
4-5-4. Linking from Reports to Other Content . . . 47
Chapter 5. Airworthiness Directive (AD) Status . . . 50
5-1. General Description . . . 50
5-2. AD Status Data Structure Diagram . . . 50
5-3. AD Status XML Schema Diagram . . . 51

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Full document details: A4A SPEC 2500 2017

5-4. AD Status XML Element Table . . . 51
Chapter 6. Service Bulletin / Mod / STC Status . . . 55
6-1. General Description . . . 55
6-2. SB Mod STC Data Structure Diagram . . . 55
6-3. SB_MOD_STC Status XML Schema Diagrams . . . 56
6-4. SB_MOD_STC XML Element Table . . . 56
Chapter 7. Repair Damage Status . . . 59
7-1. General Description . . . 59
7-2. RepairDamage Structure Diagram . . . 59
7-3. Repair Damage Status XML Schema Diagram . . . 61
7-4. Repair Damage Status XML Element Table . . . 63
Chapter 8. Last Done Next Due Maintenance Status . . . 69
8-1. General Description . . . 69
8-2. Last Done Next Due Maintenance Status Structure Diagram . . . 69
8-3. Last Done Next Due XML Schema Diagrams . . . 70
8-4. Last Done Next Due XML Element Table . . . 70
Chapter 9. Installed Component Status . . . 74
9-1. General Description . . . 74
9-2. InstalledComponentStatus Structure Diagram . . . 74
9-3. Installed Component XML Schema Diagrams . . . 75
9-4. Installed Component XML Element Table . . . 77
Chapter 10. Aircraft or Top Asset Status . . . 84
10-1. General Description . . . 84
10-2. AssetStatus Structure Diagram . . . 84
10-3. Asset Status - XML Schema Diagrams . . . 85
10-4. XML Element Table . . . 85
Appendix A. Acronyms & Abbreviations . . . 92
Appendix B. Glossary . . . 93

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Chapter 1. Overview

1-1. Purpose

ATA Spec 2500 is intended to assist in standardizing the process by which owners, operators, lessors and lessees exchange operational and maintenance data during transition from one stakeholder to another.

Costs, complexity and risk are currently high at the time of transition and Spec 2500 seeks to address and mitigate these issues through standardization of the data transfer format.

1-2. General Description

ATA Spec 2500 is an XML-based data format designed to standardize aircraft transition information between relevant parties or systems.

The standard has been designed to cater for both data-heavy (e.g. AD Status Report) and basic (e.g. Certificate of Registration) datasets and is aligned with the ICAO/IATA/AWG document types included in a typical transfer. The standard allows the information being output by one organization to be saved in a specific XML format using a specific naming convention and can therefore be received and consumed by another organization according to the same specific format and naming convention. Previously there has been no standard available so one system's output format is not generally compatible with another system's input format.

In order to combine the typical set of documentation and information (the dataset) into one concise area for onwards transmission, the notion of a 'Crate' full of information (data) has been adopted. The Crate is an XML file itself, designed to host many separate datasets inside, both XML and non-XML, known as the Crate Content. The Crate can contain data for one or more Assets and can contain full or partial datasets. Several Crates of information may be sent at different times and can be combined to make a full or final dataset.

Some datasets (content) inside the Crate are complex and consist of many data fields which together make up Summaries or Status Reports (e.g. the information for many ADs viewed together makes up an AD Status Report). These will typically be in a standardized XML format. Some datasets inside the Crate are simpler but can contain links to PDFs or other documents (themselves contained within the Crate or optionally available elsewhere but linked within the Crate). Both types of content can be combined within one Crate, depending on the data format available to the sending system.

The sending system(s) could in fact gather the relevant data and output an XML file that is sent on to another party or, in a more advanced implementation, the sending system could transfer the data directly to the receiving system via API, but still using the same XML format to hold and describe the data.

1-3. Benefits

The use of electronic formats and processes for the exchange of aircraft, engines, propeller and appliances maintenance and operational documentation offers several distinct advantages over paper.

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- Through the use of standard data semantics and structures, a higher degree of data reliability and consistency can be achieved
- Through adoption of common, widely available digital security technologies it's considerably more difficult to forge or alter data without it being detected and data can more easily be traced directly to the source
- The frequency of lost, damaged and unreadable documents can be significantly reduced
- Through automated processes for generation, transmission, and processing of data, costly human errors can be greatly reduced
- The cost and difficulty to store, retrieve and analyze information can be substantially reduced
- Receiving companies can more easily transfer data into their primary Maintenance and Engineering IT systems without re-entering data

1-4. Scope

This specification is limited to descriptions of the data and processes necessary for the exchange of electronic transfer of aircraft operational and maintenance records. It does not include the internal processes that companies use to generate the data, authorize users or signers of the data, nor process, store, or repurpose the data.

The rationale for this approach is that such internal processes are specific to each company and are governed by company policies and procedures and/or regulatory guidance. The purpose of this specification is to facilitate communication of information between companies and therefore there is no need, nor is it desirable to standardize internal company processes.

The initial XML datasets covered by the Spec. are: AD Status Report, SB/Modification/STC Status Report, Repair Damage Status Report, Installed Component Status Report, Last Done Next Due Maintenance Report and Aircraft Status Report. However all Transfer Records per the ICAO/IATA/AWG Transfer List can still be accommodated using the PDF Linking method within the Crate.

Note that although there is a plan to provide "reference" XSLT files which assist the users of the XML to depict the file in an easy to read format (such as a printout, html, etc.), it is not assumed that the XML will be printable in a format that will be fully acceptable to all involved to replace the current printouts which are often exchanged. It will be up to submitting and receiving companies to determine if a printout of the XML is sufficient or whether separate printouts should be requested.

1-5. Regulatory Impact

Much of the content in aircraft maintenance and operational record documentation and reports, as well as many of the processes for generating and exchanging the information is governed by the regulatory authorities. In most cases, the regulatory guidance assumes that the information will be conveyed using paper forms, reports and documents. This specification is not intended to replace nor

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circumvent such guidance, but instead describe how the underlying intent and objectives can be met using electronic data formats and processes.

There are several regulatory guidelines for the use of electronic data in the aviation industry that have been issued by the FAA, EASA and other civil aviation authorities. These include (but are not limited to):

- AC 120-78A – Acceptance and Use of Electronic Signatures, Electronic Recordkeeping Systems and Electronic Manuals
- FAA Order 8000.79 – Use of Electronic Technology and Storage of Data
- FAA-IR-02-05 – Aircraft Certification Guide for the Use of Electronic Technology and Alternative Methods of Storing Information
- EASA NPA 2014-04
- ICAO AIRP.009.01.EAMR
- CAR 605.93 – Technical Records – General
- CAR 573.15 – Technical Records
- CARS Standard 625.93 – Technical Records – General

This specification does not replace any regulatory requirements, guidance or other applicable government mandated form. It is the user's responsibility to ensure that all relevant regulatory requirements are met.

Any apparent conflicts between this specification and governing regulatory requirements should be reported to the ATA e-Business Program at admin@ataebiz.org. Proposed revisions to this specification and/or governing regulatory requirements will be coordinated between ATA and the relevant authorities in an effort to maintain consistency and accuracy in the specification.

1-6. Digital Security

This revision of the specification doesn't describe standardized digital security implementation. This will be released in a future revision. Refer to ATA Spec 42, Aviation Industry Standards for Digital Information Security for information on this subject.

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Chapter 2. General XML Guidance

2-1. Documenting and Organizing the XML Schema

Much of this document is meant to be a business companion guide to the XML Schema, highlighting the files, structure and particularly business rules for implementation. Below describes the formats and general guidelines for the XML used throughout the specification. Each major component of the specification (such as the Crate, the AD Status Report, etc.) will have a description, a high level chart describing the hierarchical relationship of the key elements, a table (as shown below) which matches the XML Schema, a graphical view of the XML Schema.

Note:	The actual XML Schema (XSD files) will be in the Zip file of the specification that accompanies this guideline. Additionally it is expected that example XML Instance files as well as XSLT stylesheets will be developed by the working groups and maintained on the ATA e-Business Web site for reference at www.ataebiz.org/atrwg

The layout format of the element and attribute descriptions is a nested grid of parent-child elements. Parent elements are represented as spanning one or more sub-elements or children. Elements that also have other elements grouped within them are nested within the parent element until all elements and attributes are listed.

Figure 1 - XML Table Structure

Element Name	Reqd Y/N/C	Data Type/ Length	Repeatable Y/N	Example	Remarks
Parent Element					
Sub-Element					
Sub-Element					
Sub-Element with Children					
Child to Sub-Element					
Child to Sub-Element					
Sub-Element					

Each row provides information for the following columns within the table:

- **Element Name** – Name of the element or attribute as it appears in the ATA_AircraftTransferRecords XML schema [3].

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- **Reqd (Required) Y/N/C-** Indicates whether a value for the elements or attribute is required (Y) or not required (N) in the XML instance document. Use of "C" indicates that the field is conditional and the conditions defining the field are described in the remarks column.
- **Data Type / Length** – Indicates the type of data that may be stored (alpha numeric), any limitations on the number of characters or decimal places and other constraints.
- **Repeatable Y/N** – Indicates whether an element is repeatable
- **Example –** An example of a Records entry whose value may be entered into an element of the XML instance document.
- **Remarks** – Additional notations helping the user to understand usage of the specific element.

If a column is not applicable to a given row, an entry of "NA" (not applicable) is inserted within the corresponding cell.

2-2. Versioning and Validating the XML Schema

The Schema file has a version attribute indicated. Each instance XML file submitted by the user should use the version to indicate which XML Schema (XSD) the XML instance file has been produced based on and which it can be validated against. That way, the recipient can ensure which XML Schema was used for creation and validation of the XML file. Additionally, the major status reports which are referenced within the Crate are maintained as separate XSD files with their own versions. This allows individual companies to agree on different versions of individual status reports without losing compatibility on others they may not have implemented

Versions of future XML Schema will use a loose major/minor/backwards compatibility system whereby the version number consists of a decimal number. The number in front of the decimal indicates major versions in which both the sending and receiving systems would need to be modified to maintain compliance, whereas increments of the numbers to the right of the decimal indicate minor change whereby the sending system doesn't need to change their system to continue to maintain compliance, even if the receiving system has moved to the next major version.

Although not all XML parsers support this, as a general principal, it is recommended that recipients of a file who receive an element that isn't recognized, yet isn't one of the "mandatory" elements for that version, bypass that element and continue to try to validate and receive the remaining data.

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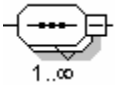
2-3. XML Schema Illustration Convention

Throughout the document, the XML schema elements and attributes, constraints, and relationships are described through the use of text and illustrations. Figure 2.2 includes explanations of the symbols used in the illustrations.

Table 1 - XML Diagram Conventions

Convention	Meaning	Example
Rectangle with small-dashed lines	Optional element or attribute	
Rectangle drawn with solid lines	Required element or attribute	
Numbers under an object	Indicates how many instances of the object may occur at that location in the schema hierarchy. The first number specifies the lower bound or minimum number of instances. The second number indicates the upper bound or the maximum number of instances. An infinity symbol means that there is no upper bound to the number of instances.	
Octagonal object containing the word "any"	Indicates that besides the predefined content, the user may include additional content without violating the schema.	
Octagonal object containing a horizontal line with three dots on it	Indicates that child elements must be ordered in the sequence shown.	
Octagonal object containing three vertical dots connected by a line	Indicates a choice – any child element (1 or more) may be included in the document instance	
Rectangle drawn with an arrow	Indicates that the element definition is established by reference	

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2-4. XML Data Types

Data types used in XML are defined by the World Wide Web Consortium (Reference [2]). For convenience, several data type format definitions are included here.

2-4-1. date

Date to conform to the ISO 8601 format:
[yyyy] – [mm] - [dd]

2-4-2. dataTime

Date and time conform to the ISO 8601 extended format:
[yyyy] – [mm] – [dd] T[hh]: [mm]: [ss] ± [hh]: [mm]

Or for UTC
[yyyy] – [mm] – [dd] T[hh]: [mm]: [ss] Z

2-4-3. duration

Duration conforms to the ISO 8601 format as specified in the following form:
P[n]Y[n]M[n]DT[n]H[n]M[n]S

Where:
P – Indicates the period (required)
[n]Y –Indicates the number of years
[n]M – Indicates the number of months
[n]D – Indicates the number of days
T – Indicates the start of a time section (required to specify hours, minutes or seconds)
[n]H – Indicates the number of hours
[n]M – Indicates the number of minutes
[n]S – Indicates the number of seconds

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Chapter 3. Common Data Types

3-1. General Description

This section defines several XML Data Types which are re-used across multiple XML Schema. An XML type allows a standardized method of tagging data which can be applied in different contexts. For example, the DocumentReferenceType may describe various fields such as document number, revision date, etc. which can apply to any document. Then an individual XML Schema may use that DocumentReferenceType against, for example, an individual "Substantiating Data" field, or an individual "Maintenance Record" field so that each of those applications would be described in the same manner.

3-2. Common Types Descriptions

For each of the below common types, descriptions of the types are contained in the first row of the tables of elements. The XML Schema Diagrams are shown below as a group, followed by the tables. Note a few of the XML Schema Diagrams are not shown on their own but rather as part of a parent common type.

3-3. Common Types Schema Diagrams

Figure 2 – AircraftInformationSegmentType Schema Diagram

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Figure 3 – EngineInformationSegmentType Schema Diagram

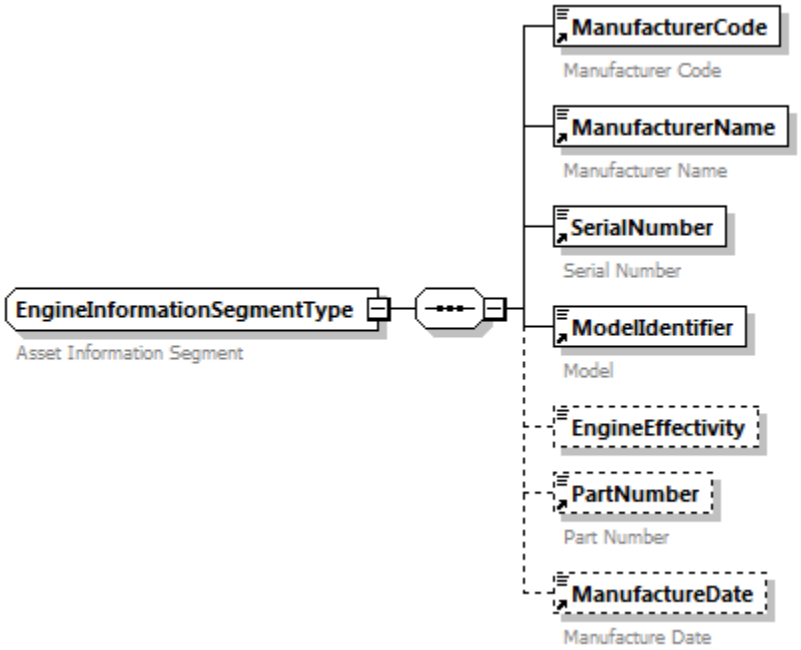

Figure 4 - OtherAssetInformationType Schema Diagram

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Figure 5 - DocumentReferenceType Schema Diagram

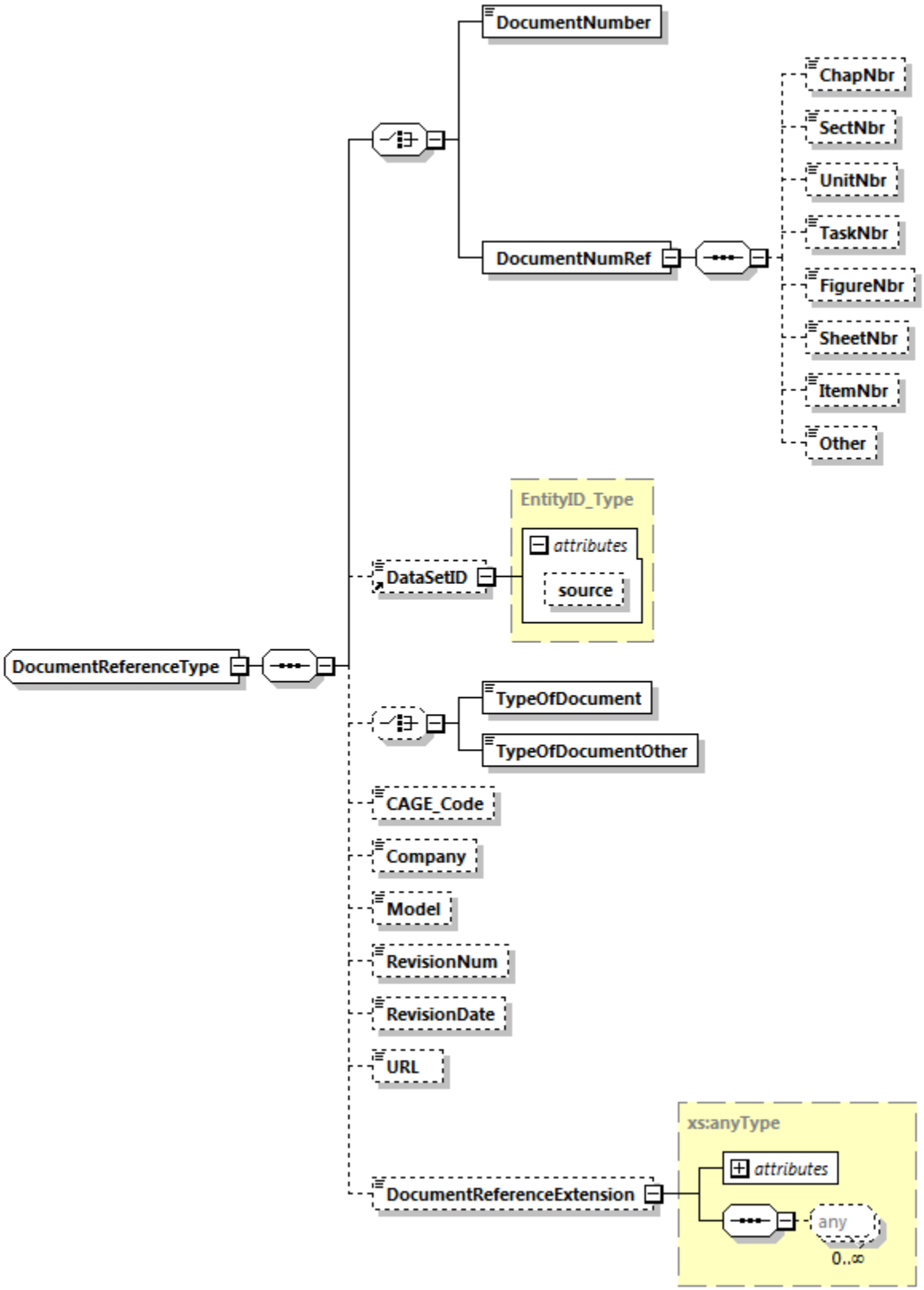

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Figure 6 – FrequenciesAccomplishedType Schema Diagram

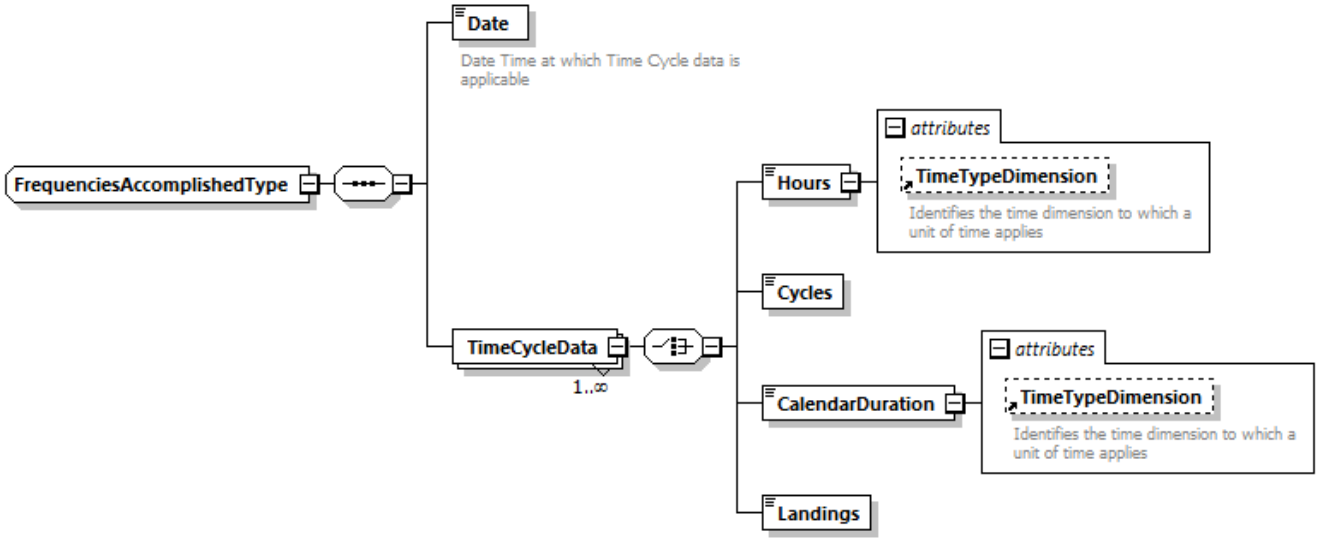

Figure 7 - FrequenciesExtendedType Schema Diagram/

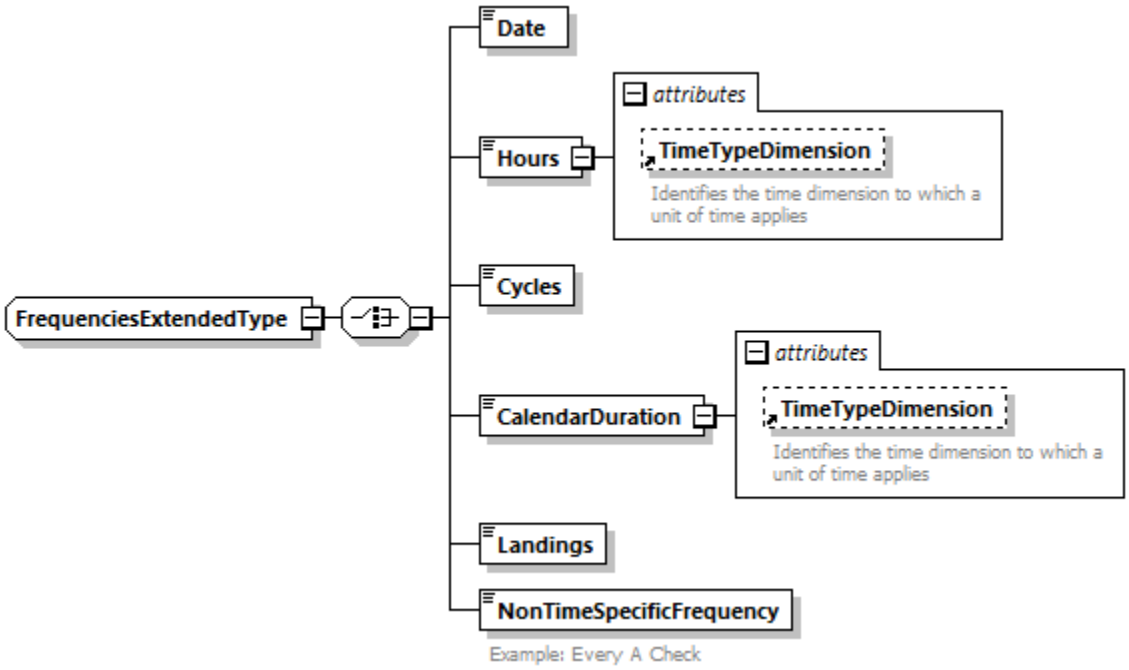

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Figure 8 - TimeCycleType Schema Diagram

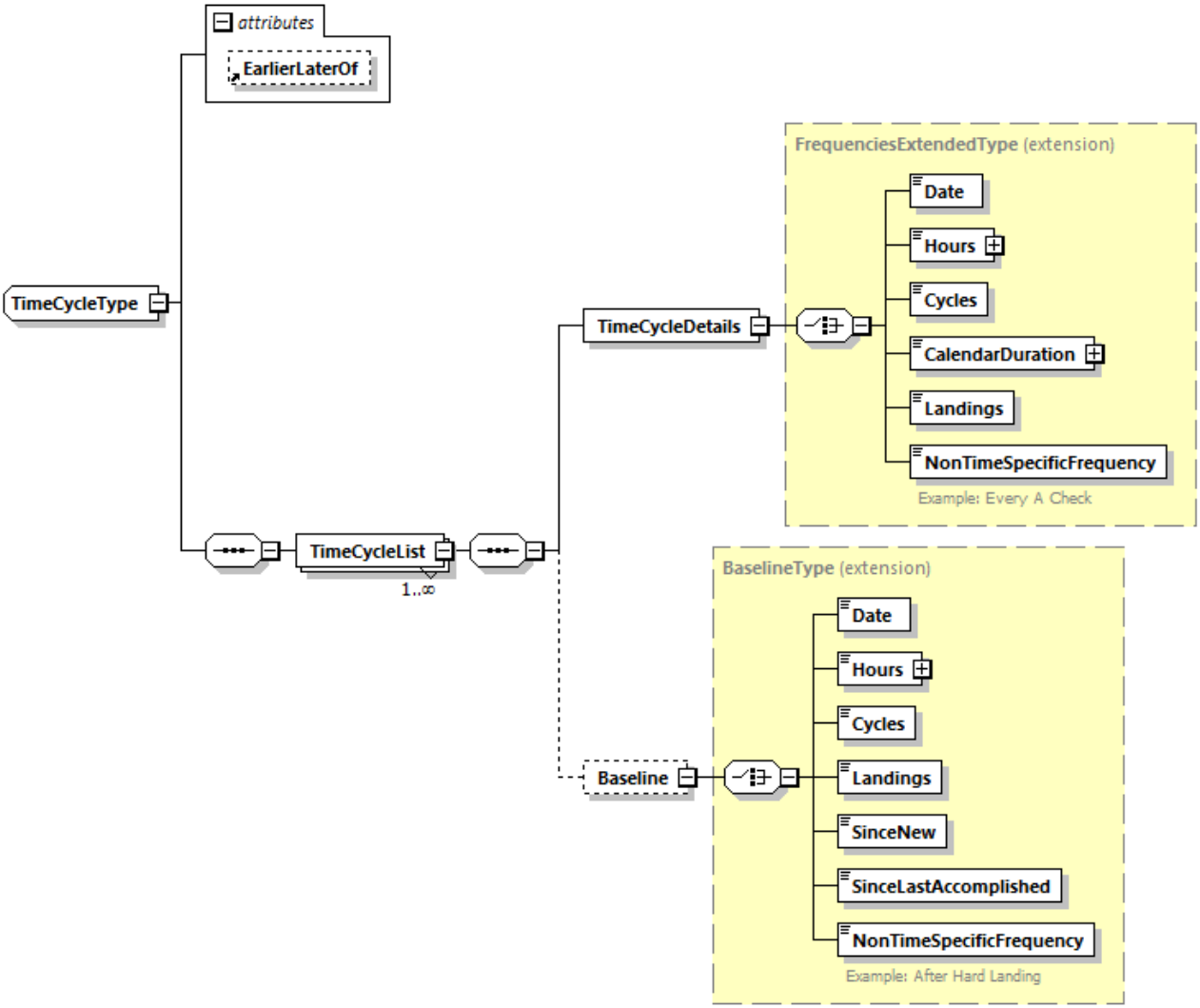

Figure 9 - DimensionType Schema Diagram

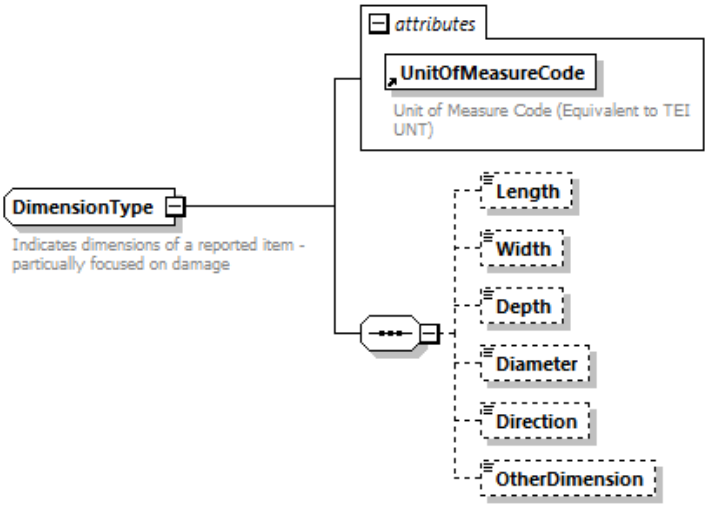

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Figure 10 - LocationType Schema Diagram

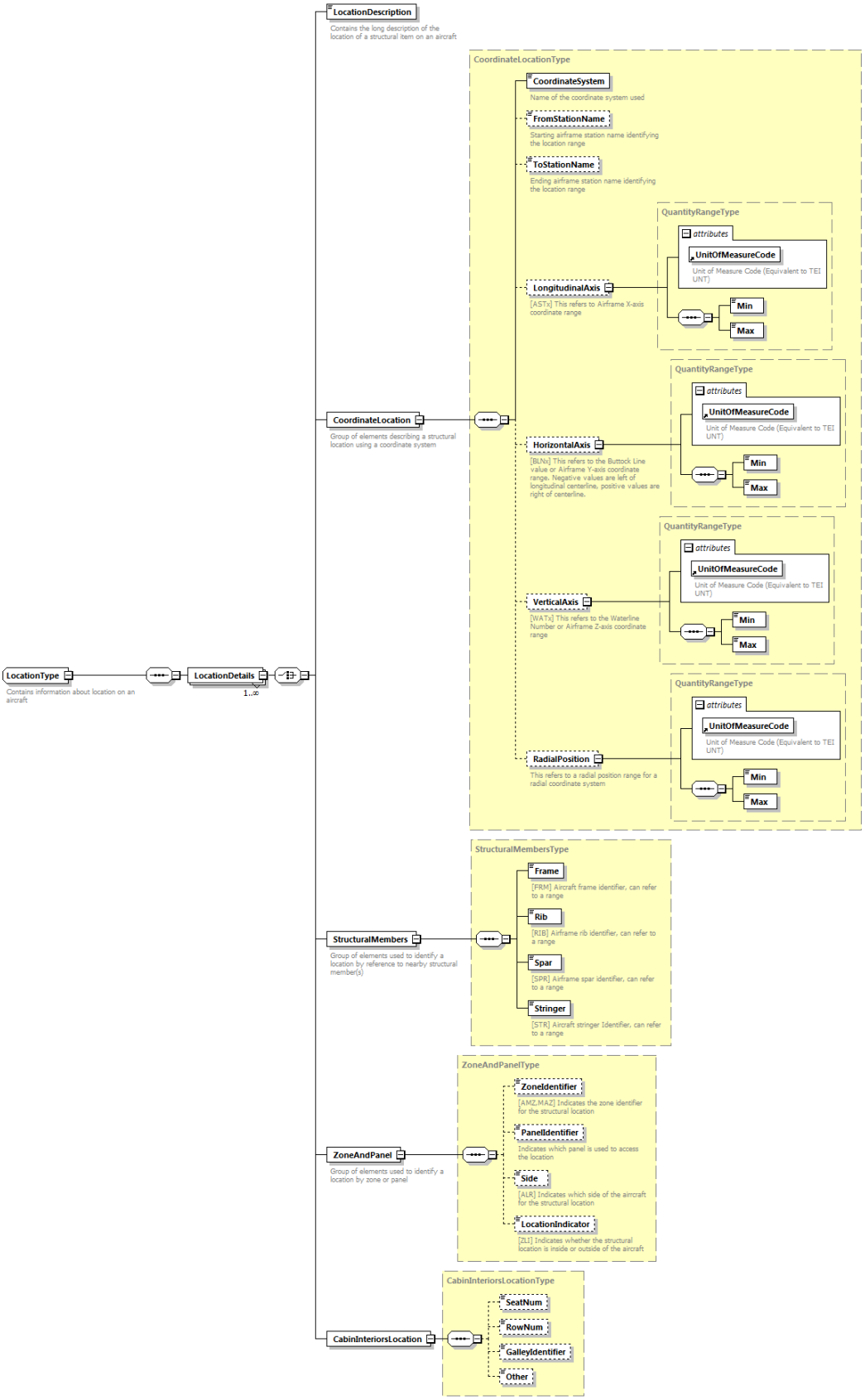

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Figure 11 - AirframeZoneLocationConfigType Schema Diagram

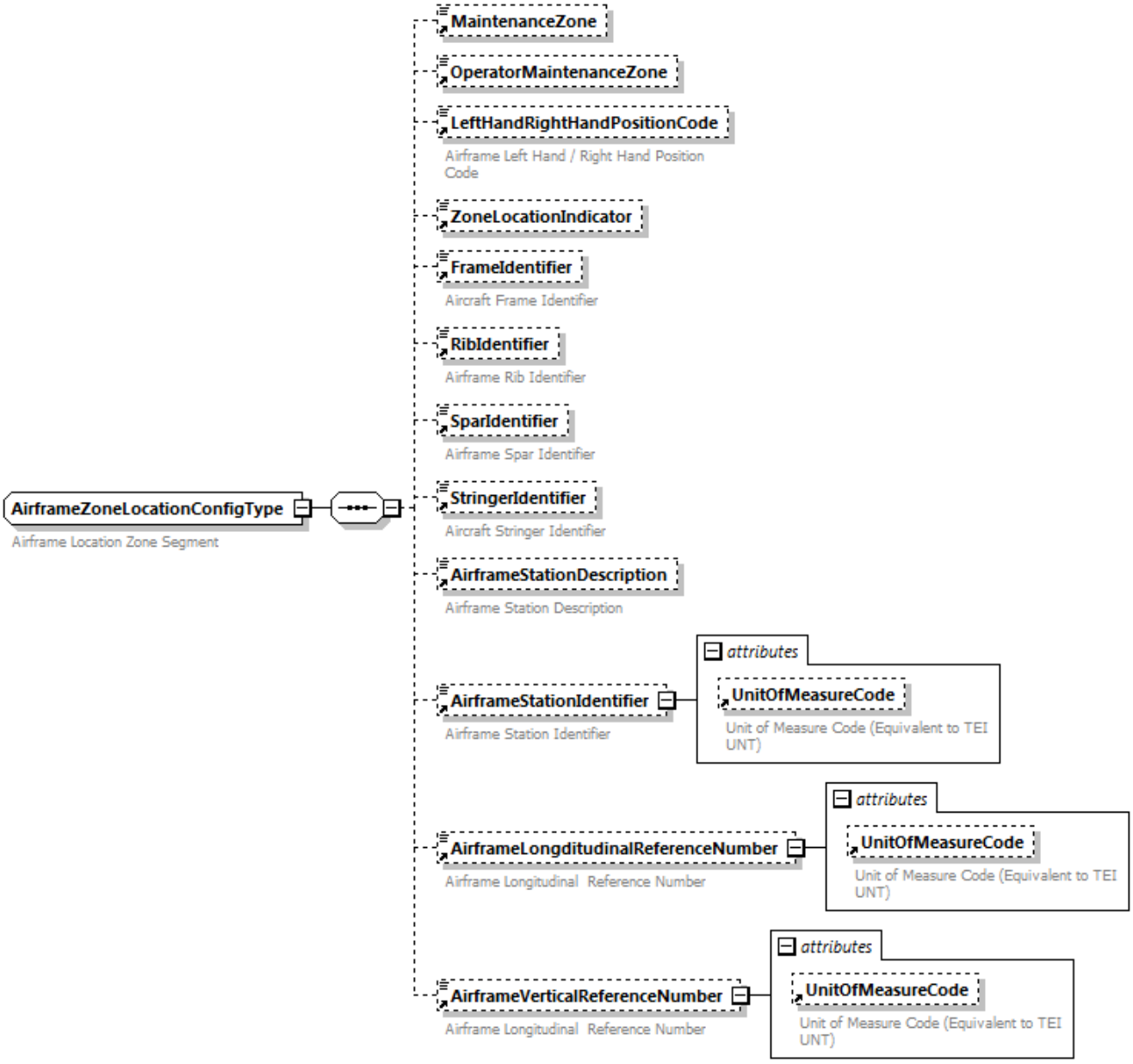

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Figure 12 - MethodOfComplianceType Schema Diagram

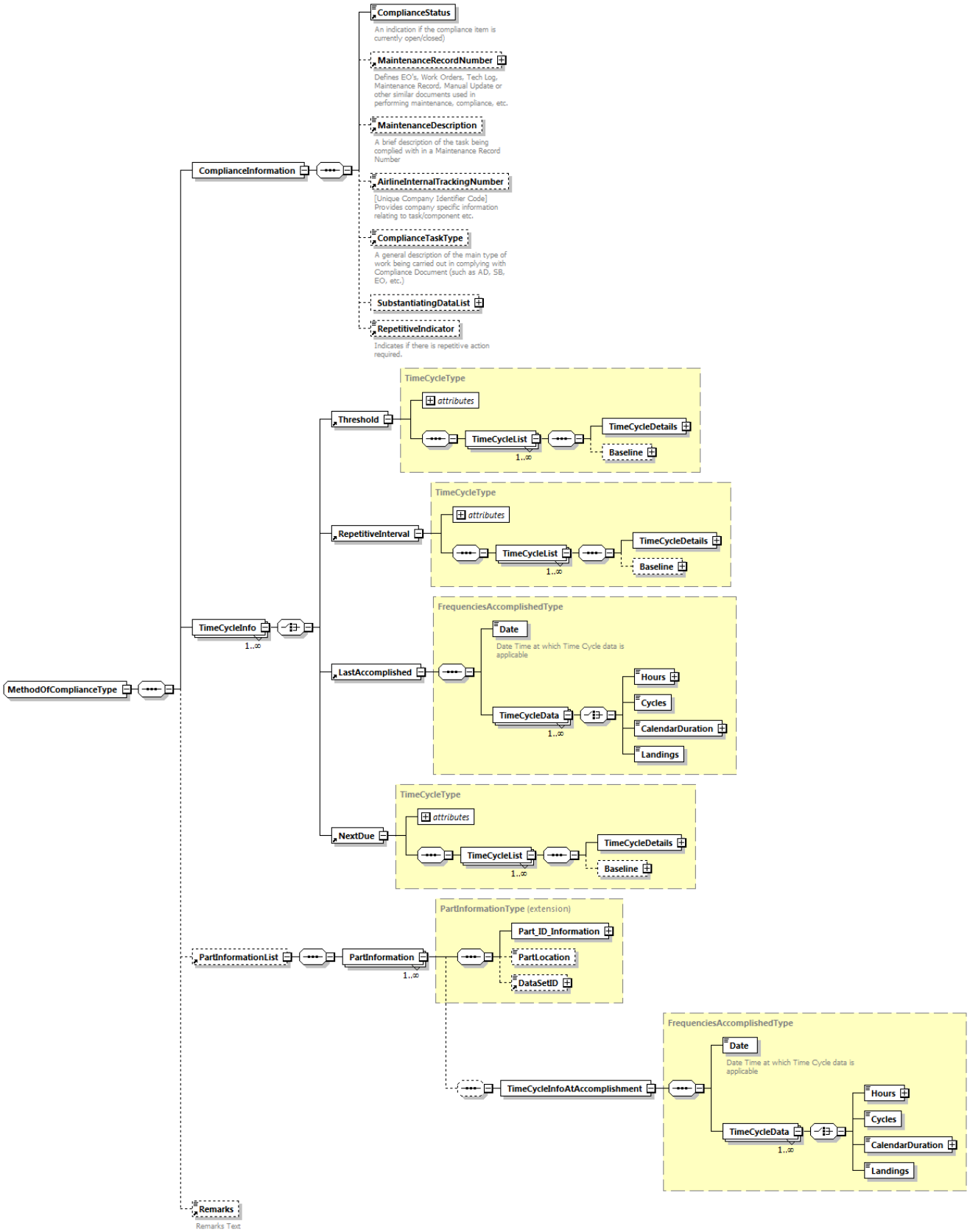

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Figure 13 - ParagraphInformationType Schema Diagram

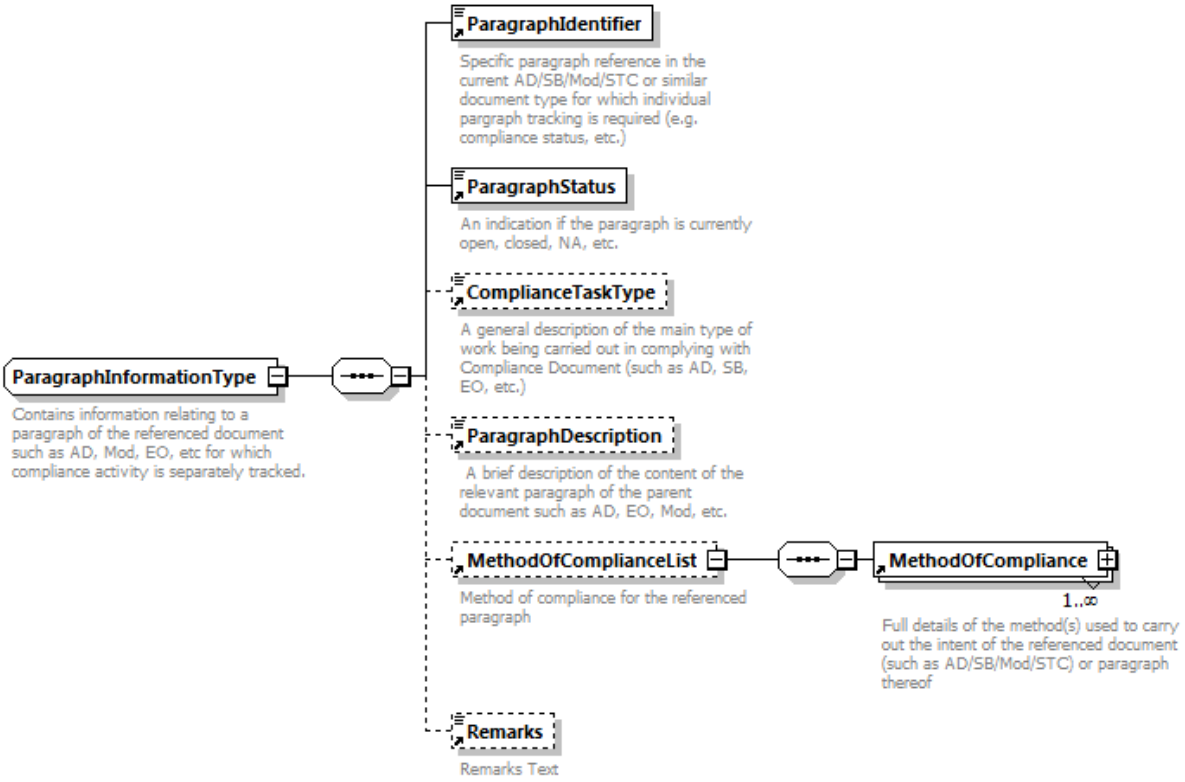

Figure 14 - SubPartInformationType Schema Diagram

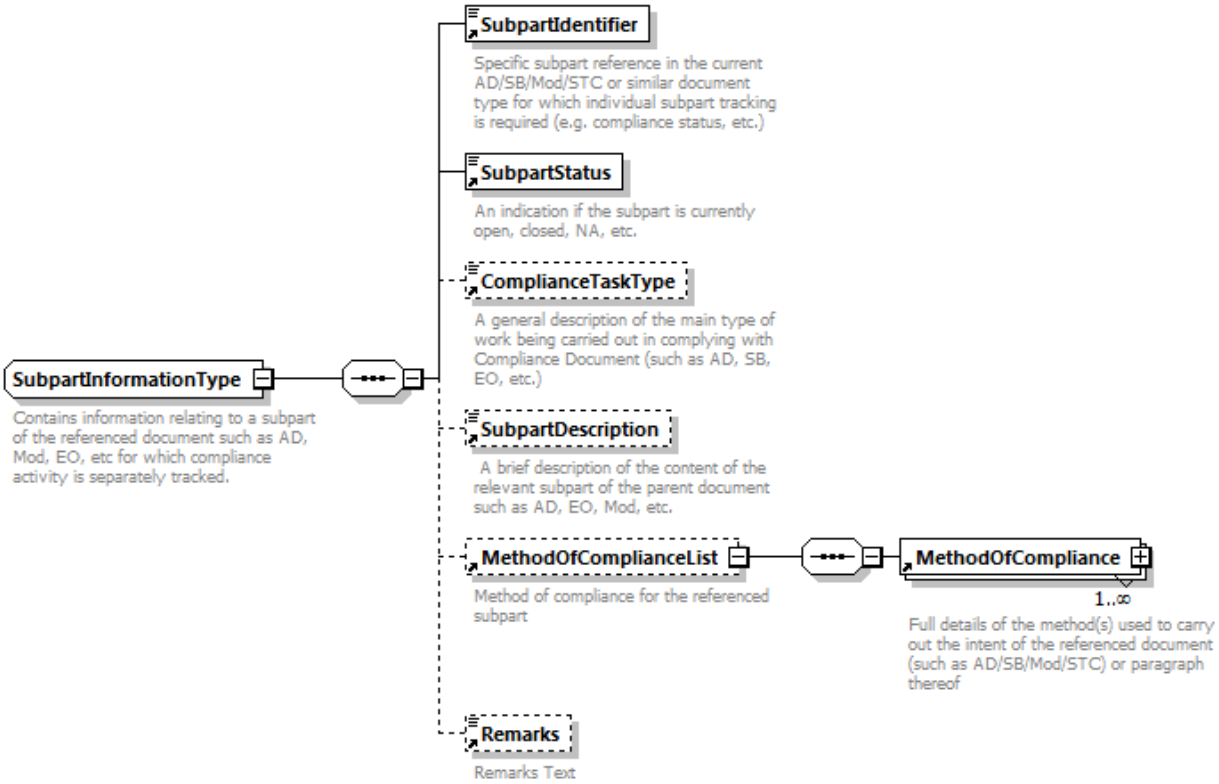

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Figure 15 - PartInformationType Schema Diagram

(includes Part_ID_Information Type)

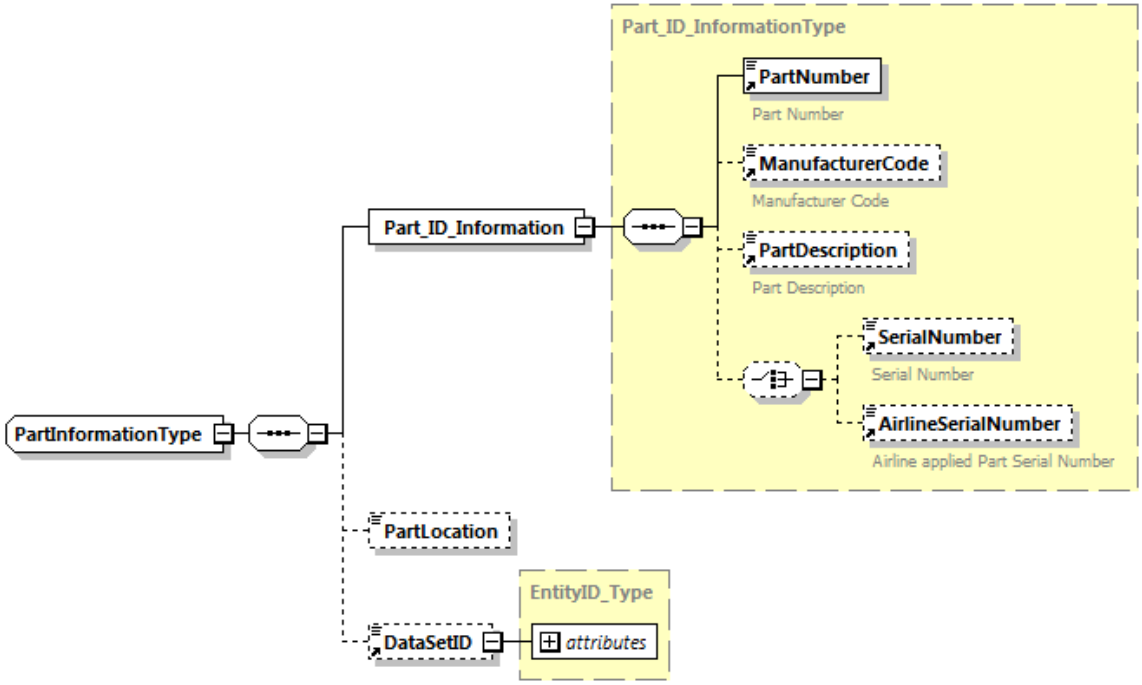
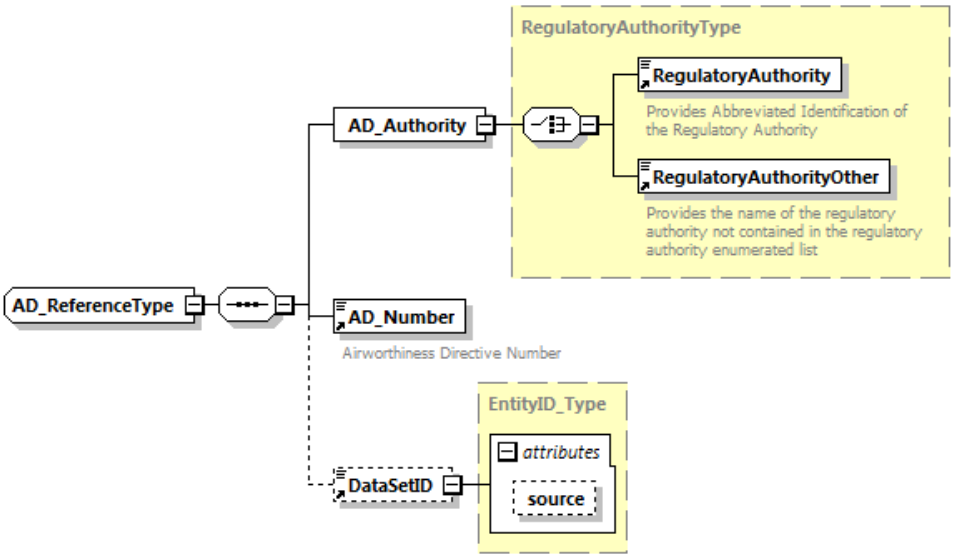


Figure 16 - AD_ReferenceType Schema Diagram

(includes RegulatoryAuthorityType)



3-4. Common Types XML ElementTables

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ElementName	Reqd Y/N/C	Data Type/ Length	Repeat Y/N	Example	Remarks
AircraftInformationSegmentType		[AircraftInformationSegmentType]			Common Type to describe key information about an individual Aircraft
ManufacturerCode	Y	string min:5 max: 5	N	81205	Manufacturer's CAGE Code
ManufacturerName	Y	string min: 1 max: 55	N	The Boeing Company	
SerialNumber	Y	string min:1 max: 30	N	30001	Airframe Serial Number
ModelIdentifier	Y	string min: 1 max: 64	N	767-36N	
AircraftRegistrationNumber	Y	string max: 10	N	N-XXXX	
AircraftSeriesID	N	string max: 10	N	767-300	
ManufactureDate	N	date	N	2001-06-15	
AircraftLineNumber	N	string min: 1 max: 10	N	114	
VariableEngineeringNumber	N	string max: 20	N	YA001	
OperatorAircraftInternalIdentifier	N	string max: 10	N	asset30800	Operator aircraft identifier such as nose number, tail number or other information that may be found on internal airline documentation.
EngineInformationSegmentType		[EngineInformationSegmentType]			Common type to describe a specific engine.
ManufacturerCode	Y	string min:5 max: 5	N	07482	Engine Manufacturer's CAGE Code
ManufacturerName	Y	string min:1 max: 55	N	General Electric	
SerialNumber	Y	string min: 1 max: 30	N	710553	
ModelIdentifier	Y	string min: 1 max: 64	N	CF6-80C2B7F	To contain the full Engine type inclusive of current thrust rating sub-part number where applicable
EngineEffectivity	N	string: max: 20	N	Y5A16	
PartNumber	N	string min: 1 max: 32	N		
ManufactureDate	N	date	N	2001-06-15	
OtherAssetInformationSegmentType		[OtherAssetInformationSegmentType]			Parent group to describe the Other Asset to which the CrateContent refers. Required if the top level asset is any asset type other than aircraft or engine.
AssetType	Y	string min: 20	N	APU	Other tracked Asset Types. Constrained Enumerations: Aircraft, APU, Engine, Component, Landing Gear, Propeller Note: Aircraft and Engine should not be used in this specific element.
ManufacturerCode	Y	string min:5 max: 5	N	40931	Asset Manufacturer's CAGE Code
PartNumber	Y	string min:1 max: 32	N	GTCP331	
SerialNumber	Y	string min: 1 max: 30	N	P-XXXX	
PartDescription	N	string min: 1 max: 100	N	Auxiliary Power Unit	
ManufacturerName	N	string min: 1 max: 55	N	Honeywell	
ModelIdentifier	N	string min: 1 max: 64	N	GTCP331-200 (ER)	
ManufactureDate	N	date	N	2001-06-15	
EntityID_Type		[EntityID_Type]	N	iu3456KX1234adf	This is a system produced unique identifier for the related data point or reference.
Source	N	C	N	Oracle_Track	Attribute of DataSetID. System which assigned the unique identifier

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ElementName	Reqd Y/N/C	Data Type/ Length	Repeat Y/N	Example	Remarks
DocumentReferenceType		[DocumentReferenceType]			Common Type to describe important information about various "documents" (or equivalent data), including the document name/number, L86 version information, etc.
DocumentNumber	Y	string Max: 100	Y	EO 1234AB1-1	Choice. Contains a single text string identifier of a document. Either this field or DocumentNumRef must be provided.
DocumentNumRef	Y	C		27-51-00-27	Choice. Group for a formatted document reference. Either this group or DocumentNumber must be provided.
ChapNbr	N	integer 2 digits	N	27	Chapter number of the document reference
SectNbr	N	integer 2 digits	N	51	Section number of the document reference
UnitNbr	N	integer 2 digits	N	00	Unit number of the document reference
TaskNbr	N	string: Max: 15	N	27	Used to identify the detailed reference to the task
FigureNbr	N	string: 6 digits	N	27	Figure Number of the document reference (typically used for an IPC/IPD reference)
SheetNbr	N	string: 6 digits	N	27	Sheet Number of the document reference (typically used for an IPC/IPD reference)
ItemNbr	N	string: 6 digits	N	27	Item Number of the document reference (typically used for an IPC/IPD reference)
Other	N	string: Max: 15	N	27	To be used for not yet forseen document referneces
DataSetID	N	[EntityID_Type]	N	iu3456KX1234adf	This is a system produced unique identifier for the Document
Source	N	string Max: 50	N	OracleDoc_Track	Attribute of DataSetID. System which assigned the unique identifier
TypeOfDocument	Y	Choice string: Max 6	N	IPC	Choice. Identifies the type of document (or data). Constrained Enumerations include AD, AMM, etc. See CSDD or XSD for full list. Choice of TypeOfDocument or TypeOfDocumentOther+L61
TypeOfDocumentOther	Y	Choice string: Max 50	N		Choice. Other document type if not included in the Constrained Enumerations. Choice of TypeOfDocument or TypeOf DocumentOther
CAGE_Code	N	string: Min:5, Max: 5	N	81205	CAGE code of the company who authored the referenced document
Company	N	string: Max 55	N	FedEx	Name of the Company who authored the referenced document
Model	N	string: Max 20	N	A340-600	Applicable aircraft or engine model for the document
RevisionNum	N	string: Max 12	N	12	Revision number of the document
RevisionDate	N	date	N	2015-05-20	Revision date of the document
URL	N	string: Max 1000	N		External reference to the document
DocumentReferenceExtension	N	anyType	N	N/A	Element that allows for non-ATA XML Schema Standard elements and attributes to be added to the model.

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ElementName	Reqd Y/N/C	Data Type/ Length	Repeat Y/N	Example	Remarks
FrequenciesAccomplishedType		[FrequenciesAccomplishedType]			Common type to identify time, cycles and effective date of an event which occurred. Can be applied to an asset, component, task, etc.
Date	Y	dateTime	N	2015-09-15T21:30:00Z	
TimeCycleData	Y		N		Repeating choice of required Time Cycles information at given Date
Hours	Y	duration (iso 8601)	N		Indicates the type of hours for the particular measurement. Normally flight, but for some types of assets with their own clocks, operating can be used. Constrained Enumerations: Operating, Flight (see CSDD for full list)
TimeTypeDimension	Y	string, Attribute	N	Operating	Attribute of Hours. Constrained Enumerations: Block, Calendar, Clock, Flight, Operating, Taxi
Cycles	Y	decimal	N	8421	
CalendarDuration	Y	duration	N	P120D	The total number of days (or months, or years) which the component has accumulated at the time of the referenced event. Ref xs:duration / ISO 8601 format
TimeTypeDimension	N	string	N	Operating	Attribute of CalendarDuration. Indicates the type of days, months, years for the particular measurement. Normally either Operating or Calendar (see CSDD for full list)
Landings	Y	int	N	8421	

FrequenciesExtendedType		[FrequenciesExtendedType]			Common type to describe any reportable hours/cycles/date for intervals, next due and other related fields. Used for Thresholds, Intervals, Next Dues in the TimeCyclesType block. Note: For past accomplished time/cycle information the FrequenciesAccomplishedType is used.
Date	Y	dateTime	N	2016-09-15T00:00:00Z	Date at which a requirement is due by either as a threshold or a next due.
Hours	Y	duration (iso 8601)	N	PT30000H	The total number of Hours of the Asset by which a requirement must be actioned, the interval of a requirement or when the requirement is next due. Ref xs:duration / ISO 8601 format
TimeTypeDimension	N	string	N	Flight	Attribute of Hours. The type of hours for the particular measurement. Normally flight, but for some types of assets with their own clocks, operating can be used. Constrained Enumerations: Operating, Flight (see CSDD for full list)
Cycles	Y	decimal	N		The total number of Cycles of the Asset by which a requirement must be actioned, the interval of a requirement or when the requirement is next due.

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ElementName	Reqd Y/N/C	Data Type/ Length	Repeat Y/N	Example	Remarks
CalendarDuration	Y	duration	N	P120D	The total number of days of the Asset by which a requirement must be actioned, the interval of a requirement or when the requirement is next due. Ref xs:duration / ISO 8601 format
TimeTypeDimension	N	string	N	Operating	Attribute of CalendarDuration. Indicates the type of days, months, years for the particular measurement. Normally either Operating or Calendar (see CSDD for full list)
Landings	Y	int	N		The total number of Landings of the Asset by which a requirement must be actioned, the interval of a requirement or when the requirement is next due.
NonTimeSpecificFrequency	Y	string Max: 1000	N	Next Shop Visit	A non-time designated event or occurrence by which the requirement must be actioned, or what the interval is e.g. Next Shop Visit

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