



**Commercial Aviation Safety Team (CAST)/
International Civil Aviation Organization (ICAO)
Common Taxonomy Team (CICTT)**

Adopting CICTT Taxonomies and Standards

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The CICTT

The International Civil Aviation Organisation (ICAO) and the Commercial Aviation Safety Team (CAST), which includes Government officials and aviation industry leaders, have jointly chartered the CAST/ICAO Common Taxonomy Team (CICTT). CICTT includes experts from several air carriers, aircraft manufacturers, engine manufacturers, pilot associations, regulatory authorities, transportation safety boards, ICAO, and members from Canada, the European Union, France, Italy, Japan, the Netherlands, the United Kingdom, and the United States. CICTT is co-chaired by a representative from ICAO and CAST.

The Problem

The establishment of the CICTT follows from recognition that wide variations in aviation nomenclature not only results in confusion as to meaning, but also seriously devalues safety data and information by creating unintended and unnecessary constraints on the aviation industry's ability to analyze data, integrate data from multiple source systems and share data. Variations in aviation nomenclature also result in data quality problems such as duplicate or multiple entries for the same event or entity. While some of these variations in nomenclature result from data entry errors, a contributing factor of perhaps equal importance is the absence of rigorous industry-wide standardized business rules or naming conventions for descriptors and definitions. In the absence of such rules or conventions, even the most rigorously applied definitions contain anomalies and exceptions that constrain use of the data for safety analysis and sharing purposes.

The Goal

What the CICTT is attempting to accomplish is the development of an industry-wide consensus as to what business rules and naming conventions should be applied for key aviation descriptors and data elements. The long-term goal of this effort is the development of a core universal aviation language that will maximize the industry's capability to analyze and share aviation safety data and information.

Adoption of CICTT Products

There is no intent to impose the rules and conventions on any entity: i.e., mandatory re-engineering of existing information systems is not being proposed. Rather, the expectation is that aviation entities would recognize the benefits that would follow from adoption of a standard set of rules and conventions, and over time would voluntarily adhere to them whenever they performed major up-upgrades to existing information systems or acquired new systems. Therefore, while there is no intent to mandate immediate use of the standards, the long-term goal is to accomplish that outcome as a result of the entire industry having adopted the standards on an evolutionary and voluntary basis.

To accomplish its objectives, CICTT has initiated the development of common taxonomies and definitions in the following categories: Phase of Flight; Occurrence Categories; Aircraft Make/Model/Series; and Engine Make/Model/Sub Model. Additional taxonomies and definitions will be developed once the initial set is completed. The purpose of this document is to provide guidance on how an organization can adopt CICTT taxonomies and definitions.

Overview of the Taxonomies

A group that included both aviation operations domain experts as well as users of aviation safety data and information developed the taxonomies. The taxonomies represent a consensus recommendation for a schema that can be used on a universal basis to classify aviation safety incidents and phase of flight.

Two key benefits associated with applying the taxonomies are: (1) they minimize ambiguity when describing like or similar aviation events, (2) they allow adopting organizations to inexpensively share data and information for the purpose conducting safety analysis.

Adopting Taxonomies to Current Systems

When an organization initially adopts a CICTT taxonomy, the CICTT recommends that the organization follow the steps below (the Occurrence Categories is used as an example):

Step	Example: Adopting Occurrence Categories
1. Identify the current system to which the CICTT taxonomy applies	Identify the accident/incident reporting system
2. Analyze the current system to identify where the CICTT applies in the system	Identify the table in the accident/incident reporting system that records the type of accident/incident
3. Add new data elements that record new taxonomy information	Add data element(s) that record the CICTT Occurrence Category
4. Update documentation to reflect the modification to the current taxonomy	Modify data dictionary and other necessary modification regarding the accident/incident reporting system
5. Populate new data element for new entries to the identified system	Record the occurrence category for new entries to the accident/incident reporting system

Adopting Taxonomies to New Systems

An organization is encouraged to adopt a CICTT taxonomy at the time it creates or redesigns a system. The CICTT recommends that the organization follow the steps below in such instances (the Phase of Flight Definitions is used as an example):

Step	Example: Phase of Flight Definitions
1. Determine the new system or system being redesigned	Identify the accident/incident reporting system
2. Prepare the requirements for the new system or system being redesigned	Use phase of flight definitions as a source for the system requirements
3. Design/redesign the system	Add phase of flight definitions to the new design

Step	Example: Phase of Flight Definitions
4. Implement the new/redesigned system	Note the phase of flight definitions in the system documentation
5. Populate the new/redesigned system	Record to phase of flight in the new/redesigned system

Overview of Standard Definitions

The CICTT Aircraft Make/Model standardization process defines individual aircraft in terms of a single and unique aircraft representation that is agreed upon by the CICTT user community. There are two key benefits associated with applying the process: (1) it allows an organization to integrate data from multiple systems and create new low-cost analytical tools, and (2) it allows cooperating organizations to inexpensively share data for the purpose of conducting safety analyses with more comprehensive data sets. (A similar process is being used to develop aircraft engine standard definitions)

How is the CICTT Standard used?

To understand the CICTT standard use this document in conjunction with *International Standard For Aircraft Make, Model, And Series Groupings Business Rules* Version 1.1 May 2005. There are two distinct scenarios for applying the CICTT standard: using it as an off-the-shelf component for the development of a new system, or retrofitting it to an existing system.

When applying the standard to a new system, the system developers will use the standards tables to support the data entry process. Simply stated, the standards tables can be used to create pull-down menus. When used, the reporting user will be required to select a standard CICTT value from a displayed list of makes, models, and series. In the event that a make, model or series being reported on is not in the pull down list, "no valid value" can be selected to flag the record for manual review and completion. If the aircraft reported is found later to be represented in the standard, it can be corrected. If the aircraft in question is not found to be represented in the standard, the CICTT update process would be used to create a new aircraft representation and the flagged report would be corrected when the new standard is released.

When applying the CICTT standard to an existing system, the process is more time consuming and complex. As a first step, existing representations for makes, models and series must be associated (cross-walked) to single standard representations. For example, all representations of Boeing, i.e., Boeing Corp., Boeing Aircraft Company, Boeing, misspellings (Boeing), etc., must be identified, loaded to look-up table and then related to the CICTT standard. The same is true for all models and series.

Once the process of associating current values to CICTT standard values has been completed, the next step is to write data transformation scripts. The scripts compare current values to standard values, and then insert the standard values into a new column. Values that cannot be associated with a standard can be placed into a "suspense" file to be reviewed manually. This process identifies values that were missed during the association process. It also identifies aircraft that are not represented in the CICTT standards tables. Over time, this process causes the database to become increasingly "clean" and maintenance costs are reduced.

Adopting Aircraft Valid Values to Current Systems

In addition to creating standardized definitions for of aircraft make, model, and series, the CICTT created a list of aircraft valid values. The CICTT recommends that organizations use the guidelines below if they want to add the new aircraft valid values to records that all ready exist.

Strategy:

- Start with more frequent aircraft makes and progress to the less frequent aircraft makes.
- Group aircraft with the same make (or manufacturer) before looking at aircraft models.
- If the source system uses codes, use the decodes to perform the initial linking to the valid values; however always maintain the reference to the source system code. An example of source system data appears below:

Code (if applicable)	Make and/or Manufacturer	Model
123	Airbus Industrie	A300B2-1C
ABC	A.Schleicher Gmbh&Co	ASK14
XYZ	Reims Aviation S.A.	Cessna FR172K
985	Piper Aircraft Corp.	PA 28-181

1. Create data elements to hold the new CICTT aircraft valid values

LEGACY SYSTEM			CICTT VALID VALUES					
Code (if applicable)	Make and/or Manufacturer	Model	Manufacturer	Make	Master Model	Model	Master Series	Series
123	Airbus Industrie	A300B2-1C						
ABC	A.Schleicher Gmbh&Co	ASK14						
XYZ	Reims Aviation S.A.	Cessna FR172K						
985	Piper Aircraft Corp.	PA 28-181						

2. Group aircraft from the legacy data with similar manufacturer/make names. For example, find every spelling of "Cessna" and group it together.

LEGACY SYSTEM			CICTT VALID VALUES					
Code (if applicable)	Make and/or Manufacturer	Model	Manufacturer	Make	Master Model	Model	Master Series	Series
XY2	CESSNA	172F						
	CESSNA AIRCRAFT	172 G						
XYZ	Reims Aviation S.A.	Cessna FR172K						
	CESSNA AIRCRAFT CO	CESSNA 172E						
	CESSNA AIRCRAFT COMPANY	CESSNA 337 A						
	CESSNB	Cessna 340A						
	CESSNA INC WICHITA KANSAS USA	C340						

- Populate the CICTT aircraft valid values for aircraft manufacturer and aircraft make. For example, add the CICTT manufacturer and CICTT aircraft make “CESSNA” to aircraft with every possible spelling of Cessna (At this point do not be concerned if matches include some non-Cessna aircraft or Cessna aircraft manufactured by Reims.)

LEGACY SYSTEM			CICTT VALID VALUES					
Code (if applicable)	Make and/or Manufacturer	Model	Manufacturer	Make	Master Model	Model	Master Series	Series
XY2	CESSNA	172F	CESSNA	CESSNA				
	CESSNA AIRCRAFT	172 G	CESSNA	CESSNA				
XYZ	Reims Aviation S.A.	Cessna FR172K	CESSNA	CESSNA				
	CESSNA AIRCRAFT CO	CESSNA 172E	CESSNA	CESSNA				
	CESSNA AIRCRAFT COMPANY	CESSNA 337 A	CESSNA	CESSNA				
	CESSNB	Cessna 340A	CESSNA	CESSNA				
	CESSNA INC WICHITA KANSAS USA	C340	CESSNA	CESSNA				

- Review each legacy valid value with the CICTT aircraft manufacture and aircraft make. For example review the legacy system manufacturer/make for each entry where the CICTT aircraft manufacturer and aircraft make are “CESSNA.” At this time modify the CICTT manufacturer and/or make to eliminate any non-Cessna aircraft or modify the CICTT manufacturer for Cessna aircraft manufactured by Reims.

LEGACY SYSTEM			CICTT VALID VALUES					
Code (if applicable)	Make and/or Manufacturer	Model	Manufacturer	Make	Master Model	Model	Master Series	Series
XY2	CESSNA	172F	CESSNA	CESSNA				
	CESSNA AIRCRAFT	172 G	CESSNA	CESSNA				
XYZ	Reims Aviation S.A.	Cessna FR172K	REIMS	CESSNA				
	CESSNA AIRCRAFT CO	CESSNA 172E	CESSNA	CESSNA				
	CESSNA AIRCRAFT COMPANY	CESSNA 337 A	CESSNA	CESSNA				
	CESSNB	Cessna 340A	CESSNA	CESSNA				
	CESSNA INC WICHITA KANSAS USA	C340	CESSNA	CESSNA				

- Populate the CICTT aircraft model for legacy valid values for a specific CICTT aircraft manufacturer and aircraft make as well as a general entry for the legacy aircraft model. For example, review the legacy model for each entry where the CICTT manufacturer and make are “CESSNA” and “172” appears in the legacy aircraft model.

LEGACY SYSTEM			CICTT VALID VALUES					
Code (if applicable)	Make and/or Manufacturer	Model	Manufacturer	Make	Master Model	Model	Master Series	Series
XY2	CESSNA	172F	CESSNA	CESSNA		172		
	CESSNA AIRCRAFT	172 G	CESSNA	CESSNA		172		

LEGACY SYSTEM			CICTT VALID VALUES					
Code (if applicable)	Make and/or Manufacturer	Model	Manufacturer	Make	Master Model	Model	Master Series	Series
XYZ	Reims Aviation S.A.	Cessna FR172K	REIMS	CESSNA		FR172		
	CESSNA AIRCRAFT CO	CESSNA 172E	CESSNA	CESSNA		172		

6. Populate the CICTT valid values for the aircraft master model, master series, and series.

LEGACY SYSTEM			CICTT VALID VALUES					
Code (if applicable)	Make and/or Manufacturer	Model	Manufacturer	Make	Master Model	Model	Master Series	Series
XY2	CESSNA	172F	CESSNA	CESSNA	CESSNA-172	172	No Master Series Assigned	F
	CESSNA AIRCRAFT	172 G	CESSNA	CESSNA	CESSNA-172	172	No Master Series Assigned	G
XYZ	Reims Aviation S.A.	Cessna FR172K	REIMS	CESSNA	CESSNA-172	FR172	No Master Series Assigned	K
	CESSNA AIRCRAFT CO	CESSNA 172E	CESSNA	CESSNA	CESSNA-172	172	No Master Series Assigned	E

Once the mapping is complete, the source systems should map to the valid values as illustrated below.

LEGACY SYSTEM			VALID VALUES					
Code (if applicable)	Make and/or Manufacturer	Model	Manufacturer	Make	Master Model	Model	Master Series	Series
123	Airbus Industrie	A300B2-1C	Airbus	Airbus	Airbus-A300	A300	B2	B2 1C
ABC	A.Schleicher GmbH&Co	ASK14	Schleicher	Schleicher	Schleicher-ASK14	ASK14	No Master Series Assigned	No Series Exists
XYZ	Reims Aviation S.A.	Cessna FR172K	Reims	Cessna	Cessna-172	F172	No Master Series Assigned	K
985	Piper Aircraft Corp.	PA 28-181	Piper	Piper	Piper-PA28	PA28	No Master Series Assigned	181

Helpful Information

Issue 1: If the CICTT aircraft valid values do not include the aircraft make and model.

Suggestion: Learn if the aircraft exists under a different name by looking up the ICAO aircraft type designator at (<http://www.icao.int/anb/ais/8643/index.cfm>) or use the CICTT aircraft valid values make/model and popular name search.

Issue 2: The CICTT aircraft valid values include the make, but not the aircraft model.

Suggestion: Map to the appropriate CICTT aircraft make. Send a message via the CICTT website Comments/Suggestions/Corrections (<http://www.intlaviationstandards.org>) to inform the website of the additional aircraft information needed and provide references regarding the needed aircraft information.

Issue 3: The CICTT aircraft valid values include the model, but not the aircraft series.

Suggestion: Map to the appropriate CICTT aircraft make and model. Send a message via the CICTT website Comments/Suggestions/Corrections (<http://www.intlaviationstandards.org>) to inform the website of the additional aircraft information needed and provide references regarding the needed aircraft information.

Issue 4: The legacy system contains the aircraft make and model; however the legacy system does not contain the aircraft series.

Suggestion: Research related information from the appropriate source data for the aircraft series.

Suggestion: If the CICTT aircraft valid value contains the aircraft make, model, and the series entry "No Series Exists," the CICTT has not identified a series designated by the manufacturer for the specific aircraft make and model. The CICTT aircraft valid values does not contains blank or null entries; use the CICTT aircraft valid value make, model, and the series entry "No Series Exists".

Suggestion: If the CICTT aircraft valid value contains the aircraft make, model, and series entry "Undesignated Series," the CICTT has identified at least one series designated by the manufacturer as well as a manufacturer designation that references the aircraft make and model only. Determine if the legacy aircraft make and model refers to (1) the manufacturer's designation of an aircraft make and model only or (2) the manufacturer's designation of the aircraft make, model, and a series (e.g., A or B). If the legacy aircraft make and model reflects the description in option 1, use the CICTT aircraft make, model, and series entry "Undesignated Series." If the legacy aircraft make and model contains a series as described in option 2, use the CICTT aircraft make, model, and series entry that matches the legacy system value.

Suggestion: Map to the CICTT aircraft model only.

Issue 5: An aircraft was built by more than one manufacturer and the legacy system does not differentiate as to which manufacturer built the aircraft.

Suggestion: Research the actual entry in the legacy system records to learn of additional information. The date of the event could eliminate a manufacturer that built the aircraft after the event date. The serial number could indicate which manufacturer produced the particular aircraft.

Suggestion: Research related information from the appropriate aircraft registry, type certificate, or other information.

Suggestion: Verify if only one aircraft manufacturer of the different aircraft manufacturers that built the aircraft model built the aircraft series.

Suggestion: Map to the CICTT aircraft master model only.

Issue 6: Cannot locate an aircraft in the CICTT aircraft valid values and cannot locate information on the aircraft.

Suggestion: Verify that the legacy value is an actual aircraft. The legacy system may have permitted users to enter data with no guidance. A typographical error could list an aircraft that never existed.

Suggestion: Send a message via the CICTT website Comments/Suggestions/Corrections (<http://www.intlaviationstandards.org>) to inform the website of the additional aircraft information needed and provide references regarding the needed aircraft information.