Aircraft Registry Network (ARN) Concept

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Overview

1. The existing ICAO framework
2. What States need and the current situation
3. The Aircraft Registry Network (ARN) concept
4. What we are doing:
   1. Unique manufacturer codes
   2. A common taxonomy
   3. Customized web applications for individual State registries
5. Value features / benefits for a globally connected system
6. Next Steps: feedback from States & industry

The existing ICAO framework

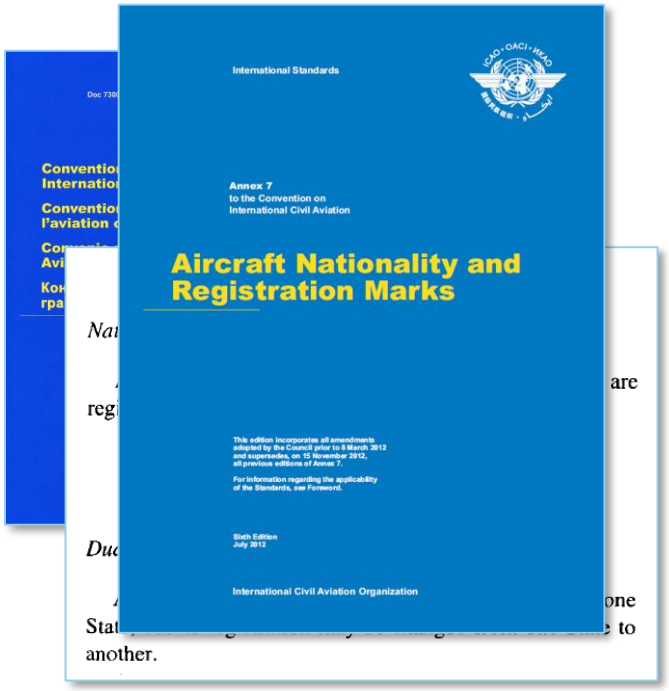
Chicago Convention: Articles for **nationality** and **registration:**

Annex 7 defines the Standards:

The wider ICAO framework is built on the foundation of these registration principles

- → Pilot Licensing;
- → Airworthiness;
- → Surveillance;
- → Accident Investigation, etc...

How can the existing framework be leveraged to benefit UA operations?



What do States need?

Rapidly increasing drone operations → Increasingly difficult to maintain satisfactory safety oversight

1. **UAS Traffic Management (UTM):** A reliable system to ensure UA can share existing airspace safely
2. **Law Enforcement:** States capable of enforcement actions when necessary

How things currently stand:

- ✕ Many States without any registration system or process at all
- ✕ Lack of consistency between States (independent development)
- ✕ No ability maintain oversight across borders / identify foreign operators

Collective recognition that this must start with *registration* in some capacity

The ARN Concept

1. **A network of *connected* aircraft registries of member States**
2. Applicable to both manned and unmanned aircraft
3. Facilitate the exchange of key information on individual aircraft
4. Enable valuable inter-State operability services to be developed

An interconnected network of *compatible* registry systems can begin to address the challenges

Current registration initiatives

1. Manufacturer Codes
2. CICTT Common Taxonomy expansion
3. Custom web-based registries available to States

1. Manufacturer Codes

ANSI/CTA Standard 2063-A: Small Unmanned Aerial Systems Serial Numbers

ASTM Remote ID standard →

…elements and characteristics of a Serial Number for small UAS

4 SERIAL NUMBER

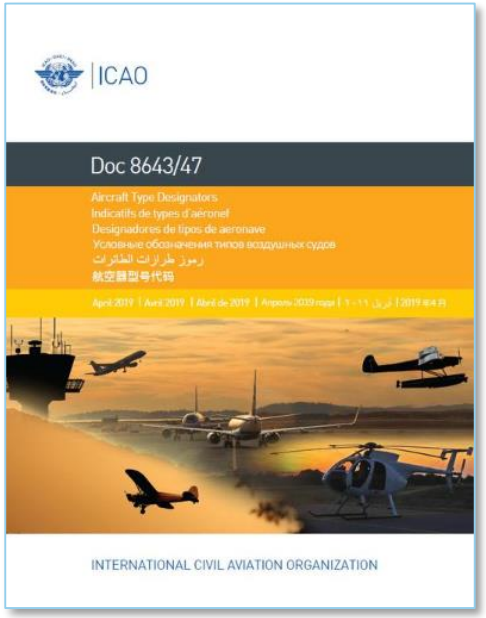
All UAS shall be assigned…

SN = [4 Character MFR CODE] [1 Character LENGTH CODE] [15 Character MANUFACTURER'S SERIAL NUMBER]

4.1 Manufacturer Code

ICAO is responsible for assigning a unique MFR Code to UAS manufacturers […].

Doc 8643 – Aircraft Type Designators



Expansion to include all UA manufacturers and 4 Character MFR Code

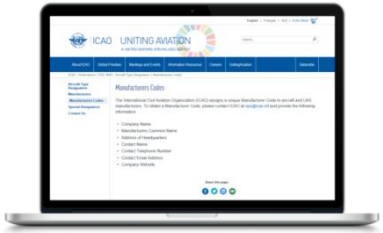
Designators for aircraft types commonly provided with **air traffic services (ATS)**

Part 1: common names of aircraft manufacturers and their aircraft types;

Part 2: aircraft by their type designators showing manufacturers and models;

Part 3: aircraft by model number and/or model name;

Part 4: full names of aircraft manufacturers.



How to get a code…

https://www.icao.int/publications/DOC8643/Pages/Manufacturers-Codes.aspx

2. CICTT: A common taxonomy

CAST – Commercial Aviation Safety Team

ICAO – International Civil Aviation Organization

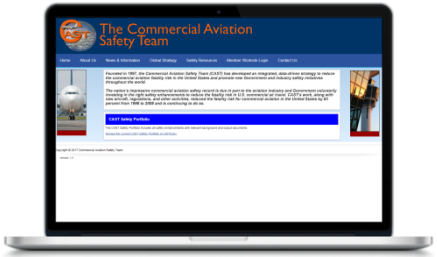
Common

Taxonomy

Team

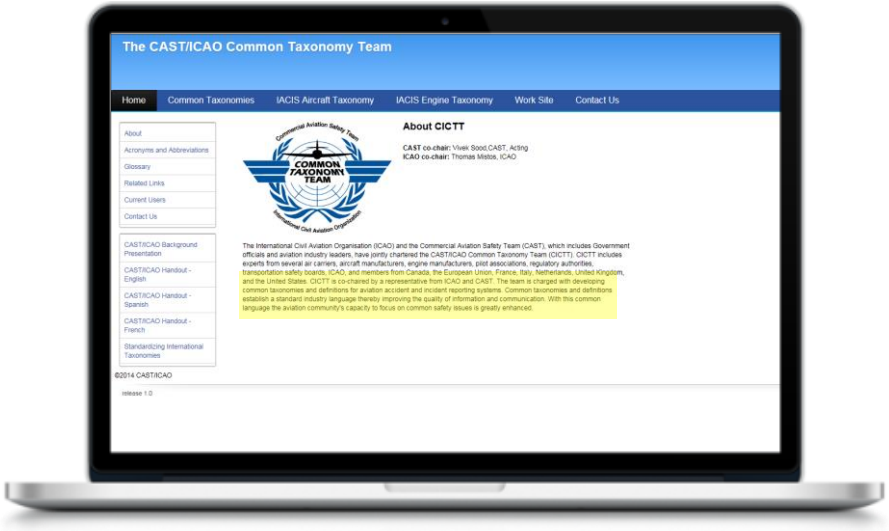
The Commercial Aviation Safety Team

U.S. Government-industry partnership…
…developed integrated, data-driven strategy…
…reduce commercial aviation fatality risk



http://www.cast-safety.org

2. CICTT: A common taxonomy



http://www.intlaviationstandards.org

Tasked with: Developing common taxonomies and definitions for aviation […] reporting systems.

- Establishes a standard industry language
- Improves the quality of information management and data communication

But why is this important for UA registration?

FUTURELAND

SIGN-IN

DRONE REGISTRATION WEBSITE

SIGN OUT

HOMEPAGE | SUBMISSIONS | NEW REGISTRATION

Aircraft Information

- Category
- Type
- Aircraft Info
- Required Aircraft Info
- Additional Aircraft Info
- Customer Info

Manufacturer

- Please select your AC Manufacturer -

- Please select your AC Manufacturer -
- ADAMS BALLOON
- ADVANCED TECHNOLOGY
- AER PEGASO
- AERIAL ARTS
- CYCLONE AIRSPORTS

Model

eries

ufacturer, Model or Series?

ntinue

A common taxonomy

ICAO is developing an **enhanced common taxonomy platform**, ***expanded*** *to incorporate UA*

REPUBLIC OF KOREA

MOLIT
Ministry of Land, Infrastructure and Transport

What will it do?

- Provide a ***managed*** **dataset** of UA make/model/series

  → *Connected* registries present pre-determined lists for selection by applicants
- Enable applicants to notify the taxonomy team of new UA types, if not available for selection
- Enable manufacturers to *proactively* inform the taxonomy team of new models, prior to release

A common taxonomy

So how does this impact the ARN concept?

→ ARN compliant registries ***must*** store aircraft data in accordance with a common taxonomy

> **Fundamental** to ensure consistency of data communication and value functionality in an **inter-connected** registry system

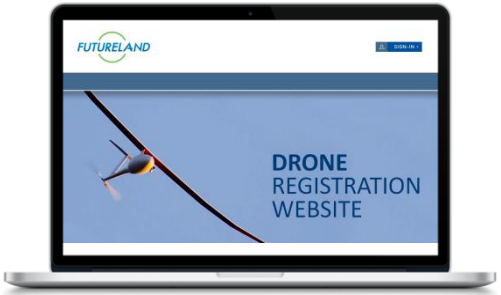
Challenges to overcome:

- Establish a technical interface with existing registries (API / Open-source code / …)
- Transition existing data sets to the common taxonomy format

3. Custom registry web application

A new **stand-alone web application** for the full *end-to-end process* of aircraft / UA registrations

Can be adopted by **any State**, at **zero cost**, to manage day to day registration tasks



Why is this useful to States?

- ✓ A turnkey electronic solution - saves money on development of own system
- ✓ Eliminates the time and cost inefficiencies of paper-based processes
- ✓ Benefits from a common taxonomy: compatible with ARN subsequent value features
- ✓ Automatic provision of pertinent information in accordance with Article 21

Value features of a globally connected system

Benefits of ***registration*** are in the *features provided* on top of the data foundation

1. Global statistical information – available to States and others
2. Facilitating Cross Border Transfers (XBT) of aircraft (State-less aircraft)
3. Operator Delegation functionality – where Operator ≠ Registered Owner
4. Facilitate International UA Operations: registered in State A, operating in State B
5. And more…?

…and the benefits they bring for UA ops

- State maintains oversight of *operators*, (even if not the registered owners)
- Owners not held responsible for infractions if the UA is in the custody of different operator
- States can identify ‘foreign’ registered drones with access to an ‘international’ dataset
- States can define specific requirements for prior ‘permission’ to foreign operators
- Operators can be more informed of individual State rules and regulations
- And more…?

More on these in the further sessions this week…

Next steps

1. **How can ICAO help facilitate development of an inter-connected registry network?**
2. How can industry support implementation of an expanded common taxonomy?
3. How else can ICAO support industry initiatives for UA registration?
4. For States: contact us to trial the web registry application developed by ICAO

aircraftregistry@icao.int

ICAO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South American (SAM) Office Lima
ICAO Headquarters Montréal
Western and Central African (WACAF) Office Dakar
European and North Atlantic (EUR/NAT) Office Paris
Middle East (MID) Office Cairo
Eastern and Southern African (ESAF) Office Nairobi
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THANK YOU