

EASA, FAA & TCCA 21 Overview – Design & Production Aircraft Certification

Introduction & Overview presented by Sofema Aviation Services (SAS) www.sassofia.com
EASA, FAA, and TCCA all aim to ensure the safety of aviation products, their approaches differ in regulatory structure, approval systems, and how they handle parts manufacturing and international collaboration.

- EASA's centralized European oversight contrasts with the FAA's more delegated, industry-involved model, while TCCA blends elements of both systems to meet Canadian needs.

Introduction

EASA (European Union Aviation Safety Agency), FAA (Federal Aviation Administration, United States), and TCCA (Transport Canada Civil Aviation) are the regulatory authorities responsible for aircraft certification in Europe, the United States, and Canada.

- Each has established a framework for the design, production, and certification of aircraft, ensuring that the aviation products meet safety standards.

EASA (European Union Aviation Safety Agency)

1. EASA Regulatory Structure

- **Centralized Authority Across Multiple Countries:** The European Union Aviation Safety Agency (EASA) operates at a **centralized European level**, providing a **single regulatory body** for aviation safety across the **27 EU member states** and some non-EU countries like Switzerland, Norway, and Iceland. This centralization enables EASA to harmonize aviation safety standards throughout Europe, ensuring uniformity in aviation laws, certifications, and airworthiness standards across the entire region.
- **Single Approval System:** EASA is **solely responsible** for key areas of aviation regulation, including the certification of aircraft, engines, and components, as well as for approving the design and production organizations. EASA's framework is based on **Regulation (EU) No 2018/1139**, which standardizes aviation safety rules across the EU.
 - **Design Organization Approval (DOA) and Production Organization Approval (POA)** are both directly issued by EASA, providing centralized oversight across the entire certification process.

- **Type certificates, Supplemental Type Certificates (STCs), and Airworthiness Directives** are also issued directly by EASA to ensure consistency across all participating nations.
- **Coordination with National Authorities:** While EASA holds primary authority, **National Aviation Authorities (NAAs)** in individual EU countries still have roles in oversight, such as enforcement and local air operator certifications. However, EASA retains the overall decision-making authority, particularly in design and production certifications, creating a **harmonized aviation safety framework** across Europe.
- **Advantages:**
 - **Uniformity:** Ensures that aviation standards are consistent across the region, preventing conflicting regulations between different countries.
 - **Centralized Control:** Provides centralized oversight, making it easier for multinational companies operating within Europe to adhere to a single regulatory regime.
 - **Harmonization with Global Standards:** EASA works closely with international bodies, including the FAA and TCCA, to align its regulatory requirements where possible.

Key Areas:

- **Design Organization Approval (DOA):** Organizations responsible for aircraft design must obtain a DOA from EASA. The DOA certifies that the organization has the capability to design aircraft or components in compliance with the relevant requirements.
- **Production Organization Approval (POA):** Similar to the DOA, organizations involved in the production of aircraft or components must obtain a POA, demonstrating their ability to comply with production requirements. (either from the competent authority within an EU country or Direct from EASA for a Third Country Approval)
- **Type Certification:** This process ensures the design of the aircraft, engine, or propeller meets the applicable standards of safety and performance. Once approved, a **Type Certificate (TC)** is issued.
- **Supplemental Type Certification (STC):** If an aircraft is modified from its original certified configuration, an STC is required to certify that the modification is safe and complies with applicable standards.

- **Continuing Airworthiness:** Ensuring the aircraft remains airworthy through maintenance, inspections, and modifications.

Specific Approach:

- EASA's regulations are more **centralized** across the EU, meaning they harmonize rules for all member states.
- EASA **directly approves** aircraft designs and Third Country Production organizations.
- EASA relies heavily on international harmonization, working with global counterparts like the FAA and TCCA, but they still have their distinct procedures and guidelines.

FAA (Federal Aviation Administration)

The FAA regulates all civil aviation in the United States under the **14 CFR Part 21**, which governs the certification procedures for aircraft and related products.

- **Federal Aviation Authority with National Focus:** The **Federal Aviation Administration (FAA)** regulates aviation safety within the **United States**. Unlike EASA's multinational framework, the FAA has jurisdiction only within the **U.S. domestic** aviation space. The FAA oversees all civil aviation aspects, from certification to air traffic control, ensuring compliance with **Title 14 of the Code of Federal Regulations (CFR)**, particularly **14 CFR Part 21**, which governs aircraft certification.
- **Delegated Authority (DER/ODA):** One of the FAA's most distinctive aspects is its reliance on **delegated authority**. Under its **Delegation Option Authorization (DOA)** and **Organizational Designation Authorization (ODA)** systems, the FAA authorizes **Designated Engineering Representatives (DERs)** and **Organizational Designees** to carry out certain certification functions on behalf of the FAA. This allows private-sector engineers and organizations to perform specific roles, such as conducting conformity inspections, issuing airworthiness certificates, and certifying designs.
 - **DERs** are individuals authorized to make decisions related to aircraft design, while **ODAs** are companies that can act as delegates of the FAA.
 - This system allows the FAA to oversee a large number of certifications by leveraging industry expertise and resources without direct involvement in every certification project.

- DERs and ODAs are held to high standards and must undergo periodic audits to ensure compliance with FAA regulations.
- **FAA's Focus on Domestic Aviation:** The FAA's primary focus is on ensuring safety within the U.S. aviation sector. However, because many aircraft and components are produced in or certified for use in multiple countries, the FAA maintains **Bilateral Aviation Safety Agreements (BASA)** with international regulatory bodies, particularly EASA and TCCA, to streamline the certification process for international products.
- **Advantages:**
 - **Flexibility and Efficiency:** The delegation model allows the FAA to expedite certification by relying on private-sector expertise.
 - **Industry Involvement:** The FAA's reliance on DERs and ODAs allows for closer collaboration with manufacturers and design organizations, fostering innovation while maintaining safety standards.

Key Areas:

- **Design Approval:** The FAA issues design approvals through Type Certificates for new aircraft designs, and Amended Type Certificates (ATC) when there are significant changes to an existing aircraft.
- **Production Certification:** Similar to EASA's POA, the FAA issues **Production Certificates** to organizations demonstrating compliance with approved production processes and quality systems.
- **Parts Manufacturing Approval (PMA):** This is a specific certification for manufacturers of replacement and modification parts. It's a unique aspect of the FAA system that doesn't have a direct counterpart in EASA.
- **Supplemental Type Certificate (STC):** For modifications to a certified design, an STC is required, much like EASA.
- **Airworthiness Certification:** Before an aircraft can be operated, it must receive an **Airworthiness Certificate** from the FAA, verifying that the aircraft meets all regulatory safety standards.
- **Repair Station Certification:** The FAA certifies repair stations under **14 CFR Part 145** to ensure compliance with maintenance standards.

Specific Approach:

- The FAA has a more **domestic focus**, but it works closely with other global regulators, particularly EASA, under the Bilateral Aviation Safety Agreement (BASA).

TCCA (Transport Canada Civil Aviation)

TCCA is the regulatory authority in Canada for civil aviation, operating under the **Canadian Aviation Regulations (CARs)**. **CAR 521** governs the certification of aeronautical products.

TCCA Regulatory Structure

- **National Focus with Bilateral Agreements: Transport Canada Civil Aviation (TCCA)** is responsible for regulating aviation within **Canada**. TCCA's regulatory structure is outlined in the **Canadian Aviation Regulations (CARs)**, specifically **CAR 521**, which governs aircraft certification, design, and production. While TCCA is primarily focused on Canadian aviation, it maintains **bilateral agreements** with other aviation authorities, notably the FAA and EASA, to ensure the mutual recognition of certifications and facilitate international operations.
- **Close Alignment with FAA and EASA:** Due to the smaller scale of the Canadian aviation industry compared to the U.S. or Europe, TCCA often aligns its regulatory requirements with those of the FAA and EASA. The **Bilateral Aviation Safety Agreements (BASA)** between TCCA and these authorities allow for the reciprocal acceptance of design approvals, production certificates, and airworthiness certificates, reducing duplication of effort for manufacturers operating internationally.
- **Certifications Issued Directly by TCCA:** TCCA, like EASA, directly issues Type Certificates (TCs) and Supplemental Type Certificates (STCs) for Canadian-designed and produced aircraft. However, it allows for the recognition of certifications from foreign authorities, such as the FAA or EASA, for imported aircraft or components.
 - **Design Organization Approval (DOA) and Production Organization Approval (POA)** are similar to EASA's approach but are adapted to Canadian standards.
 - **Parts Manufacturing Approval (PMA):** TCCA also issues **Parts Manufacturing Approvals (PMA)** for replacement parts, much like the FAA system, ensuring that components meet airworthiness standards.
- **National Aviation Safety Oversight:** While TCCA cooperates closely with other regulators, it still maintains oversight over all aviation activities within Canada. This

includes issuing airworthiness directives, overseeing repair stations, and ensuring compliance with national aviation laws.

- **Advantages:**
 - **Alignment with International Standards:** TCCA's regulatory structure is designed to align closely with both the FAA and EASA, facilitating international trade and aviation operations.
 - **Flexibility for International Manufacturers:** Bilateral agreements with other aviation authorities allow TCCA to recognize foreign certifications, reducing the burden on manufacturers operating in multiple countries.

Key Areas:

- **Type Certification:** Similar to EASA and FAA, TCCA issues Type Certificates for new designs or significantly modified aircraft.
- **Design Approval:** TCCA requires organizations to have **Design Approval** to demonstrate capability in aircraft design.
- **Production Approval:** TCCA issues **Manufacturing Certificates**, similar to FAA's Production Certificates, ensuring that the manufacturer meets regulatory standards.
- **Supplemental Type Certificate (STC):** This is required for modifications, just as in EASA and FAA processes.
- **Parts Certification:** TCCA issues **Parts Manufacturing Approvals (PMA)**, similar to the FAA's PMA process.
- **Continuing Airworthiness:** TCCA ensures ongoing airworthiness through maintenance and safety oversight of certified aircraft.

Specific Approach:

- TCCA has **similar certification standards** to FAA and EASA but maintains its distinct regulatory system based on Canadian laws and regulations.
- TCCA focuses on **bilateral agreements** with other countries for the recognition of certifications, particularly with the FAA and EASA, to ensure smoother global operations for Canadian manufacturers and operators.

Differences Between EASA, FAA, and TCCA

Regulatory Structure:

- **EASA** operates at a **centralized European level**, harmonizing aviation standards across multiple countries.
- **FAA** governs **only within the United States**, with greater use of delegated authority through DERs and ODAs.
- **TCCA** focuses on **Canadian operations** but closely aligns with both FAA and EASA through bilateral agreements.

2. Approval Systems:

- **EASA** directly oversees DOA and POA certifications, ensuring centralized control over design and production.
- **FAA** relies on **delegation** (DER/ODA), where industry professionals or organizations are authorized to act on behalf of the FAA for certain certifications.
- **TCCA** follows a more traditional model, similar to EASA, but tailored to Canadian requirements.

3. Parts Manufacturing Approval (PMA):

- PMA is a distinct process in **FAA** certification, allowing for the approval of replacement parts without the original manufacturer's involvement. EASA and TCCA have similar systems but with slight regulatory differences.

4. International Collaboration:

- All three authorities work closely together under **bilateral agreements**, particularly the FAA and EASA, to harmonize standards and make the certification process more efficient for international manufacturers.
- **TCCA** has fewer resources compared to the FAA or EASA but compensates through strong international partnerships.

5. Certification Process:

- **EASA** is generally considered more **rigorous and centralized**, requiring detailed oversight.
- **FAA** often allows for more **industry involvement** through its delegated authority system.
- **TCCA** is a **hybrid** of the two, with a strong national regulatory system but relying on international agreements for efficiency.

Next Steps

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