

Part 21 Overview

Certification of aircraft and related products, parts and appliances, and of design and production organizations

Basic Principles

- Single investigation (either by the Agency or by Competent Authority of a member state) is valid across all EU member states.
- Single rule leads to consistency of whole system.
- Quality assurance in design and production
- Key role of type certificate holder
- Approval holders have privileges
- But also obligations

Part 21

- Part 21 is an annex to commission regulation no. 748/2012
- It is therefore part of European law
- It is split into section A and B, each section also has advisory material (AMC & GM)
- Section A covers requirements for applicants
- Section B covers procedures for Competent Authorities (includes sample forms)
- Each section is further divided into subparts

The Subparts

A General provisions	I Noise certificates
B type certificates	J design organization approval
D changes to type certificates	K parts & appliances
E supplemental type certificates	M repairs
F production without production organization approval	O European technical standard order authorisations
G production organization approval	P Permits to fly
H airworthiness certificates	Q identification of products parts and appliances

Subpart A

General provisions

- Establishes general rights and obligations of applicant/holder
- Requirements for dealing with failures malfunctions and defects
- Covers airworthiness directives
- Defines co-operation required between design and production
– see AMC 21.A.4

Subpart B

- TYPE CERTIFICATES (TC)
- Obtaining a TC for an aircraft, engine or propeller
- Issue of a restricted TC for an aircraft
- Application for a TC only acceptable from the holder of an appropriate DOA (Subpart J)
- Alternative procedures to subpart J in certain cases agreed by the Agency (21.A.14b)
- Rights and obligations of TC holders
- The Agency evaluates to relevant technical code e.g. CS-25, CS-29 etc. (CS=Certification Specifications)

Subpart D

CHANGES TO TYPE CERTIFICATES

- Major changes to the TC can be applied for by the TC holder only under this subpart-otherwise see subpart E.
- Any person may apply to the agency for the approval of a minor change to the TC
 - Minor change has no appreciable effect on the mass, balance, structural strength, reliability, operational characteristics, noise, fuel venting, exhaust emission or other characteristics affecting the airworthiness of the product. All other changes are major.

Subpart E

SUPPLEMENTAL TYPE CERTIFICATES (STC)

- Major changes to a TC by other than the TC holder
- How to obtain an STC
- Only accepted from a DOA holder (subpart J) except in circumstances agreed by the Agency
- Rights and obligations of an STC holder
- EPA marking (European part Approval)
 - See also 21.A.80a, subpart Q
 - Also relevant to repairs and minor changes

Subpart F

PRODUCTION WITHOUT POA APPROVAL

- Applicant shall demonstrate that either:
 - Subpart G is not appropriate, or
 - Release of product, part or appliance is needed prior to issuance of subpart G approval
- Approval of design data and coordination with design organization same as subpart G
- Not previously used by the CAA under the JAA system – remains an option for specific cases

Subpart F

PRODUCTION WITHOUT POA APPROVAL

- Letter of agreement for use of subpart F is issued by the CAA after the applicant:-
 - Establishes a satisfactory production inspection system
 - Provides an acceptable manual (similar to a subpart G exposition)
 - Demonstrates it complies with relevant part 21 requirements e.g.21.A.3
- Letter or agreement issued for a max duration of one year.

Subpart F

PRODUCTION WITHOUT POA APPROVAL

- EASA form 1 or 52 raised by organization as appropriate
- Signed by authorised person in organization
- Validated and counter signed by CAA representative if they find through inspection the product, part or appliance:
 - Conforms to the applicable design data, and
 - Is in a condition for safe operation

Subpart G

PRODUCTION ORGANIZATION APPROVAL (POA)

- This subpart gives the rules for showing compliance of products, parts, appliances with applicable design data through an approved organization
- Production organization Exposition (POE) required
- A link between a design organization and the production organization is necessary
- No design privileges are associated with this subpart.

Subpart G

PRODUCTION ORGANIZATION APPROVAL (POA)

- EASA form 1 (Authorised release certificate), or form 52 (statement of conformity) raised by organisation as appropriate
- Signed by member of certifying staff in organization once the item is found to:
 - Conform to the applicable design data, and
 - Is in a condition for safe operation
- Release without further showing, completion standard is monitored as a mandatory element during routing surveillance.

Subpart H

AIRWORTHINESS CERTIFICATES

- For a new aircraft a certificate of airworthiness is issued upon presentation of relevant documentation (statement of conformity etc.) to the CAA
- For a used aircraft a C of A is issued upon presentation of either:-
 - An airworthiness review certificate for an aircraft from an EU member state, or
 - As above + additional info (see 21.A.174b3) for an aircraft from outside the EU

Subpart H

AIRWORTHINESS CERTIFICATES

- The CAA issue a restricted certificate of airworthiness to an:
 - Aircraft which conforms to a restricted TC, or
 - Aircraft shown to comply with specific CS ensuring adequate safety
- Permit to Fly provisions deleted from this subpart in March 2007.

Subpart I

NOISE CERTIFICATES

- For a new aircraft a noise certificate is issued upon presentation of relevant documentation (statement of conformity or similar if from outside the EU) to the CAA
- For a used aircraft a noise certificate is issued upon presentation of noise information and relevant historical records

Subpart J

DESIGN ORGANISATION APPROVAL (DOA)

- The holder of an appropriate DOA can submit compliance documents to the agency in order to obtain a:
 - Type certificate or approval of a major change to a type certificate
 - Supplemental type certificate
 - ETSO authorisation for an auxiliary power unit
 - Major repair design approval
- Which shall be accepted without further verification, subject to 21.A.257b.

Subpart J

DESIGN ORGANISATION APPROVAL (DOA)

- The holder of a DOA can, in accordance with its procedures and terms of approval:
 - Classify changes to design or repairs as major or minor
 - Approve minor changes and repairs,
 - Approve major repairs to products for which it holds the TC or STC
 - Issue approved technical documentation
 - Approve minor revisions (previously documentary changes) to flight manuals
 - Approve permit to fly conditions (with listed exceptions).

Subpart K

PARTS & APPLIANCES

- Showing compliance of the part or appliance with applicable requirements shall be made:
 - As part of type certification process, subpart B, D, or E, or
 - Unser and ETSO authorisation, subpart O, or
 - In the case of standard parts, in accordance with officially recognised standards

Subpart K

PARTS & APPLIANCES

- With the exception of standard parts and non-critical parts for ELA 1 or ELA2 aircraft, no part or appliance is eligible for installation in a type-certificated product unless it is:
 - Accompanied by an authorised release certificate certifying airworthiness, and
 - Marked in accordance with subpart Q.

Subpart K...

GM No 1 to 21.A.303(c) – Standard parts

In this context a part is considered as a “standard part” where it is designated as such by the design approval holder responsible for the product, part or appliance, in which the part is intended to be used.

In order to be considered a “standard part”, all design, manufacturing, inspection data and marking requirements necessary to demonstrate conformity of that part should be in the public domain and published or established as part of officially recognised standards.

Subpart M

REPAIRS

- Elimination of damage by replacement of parts without design activity is a maintenance task and does not need approval under this part
- Repairs are classified as either major or minor (same definition as subpart D)
- Classification can be made by either the Agency or by an appropriately approved DOA
- Damage left unrepaired needs evaluating similar to any other repair

Subpart M

REPAIRS

- Major repairs can be approved by the TC of STC holder or by the Agency
- Minor repairs can be approved by an appropriately approved DOA or by the Agency
- Compliance must be demonstrated by own resources or by arrangement with TC or STC holder
- Production of repair parts shall be wither:
 - Under subpart F, or
 - By an appropriately approved POA holder, or
 - By an appropriately approved maintenance org.

Subpart M

REPAIRS

- Latest amendment introduces concept of “standard changes and standard repairs” for aircraft of less than 5700kg MTOM, rotorcraft of less than 3175kg and sailplanes/powered sailplanes, balloons and airships per for ELA 1 and ELA 2.
- No AMC/GM material to allow implementation at present.

Subpart O

EUROPEAN TECHNICAL STANDARD ORDER AUTHORSATION (ETSO)

- An ETSO is issued by the Agency and is a minimum performance standard for specified articles
- And ETSO authorisation is the approval of both the design and production of an article
 - The agency approves the design through a declaration of design and performance (DDP) and review of the organisations design procedures
 - The production is approved through a subpart G poa, or under subpart F

Subpart O

EUROPEAN TECHNICAL STANDARD ORDER AUTHORISATIONS (ETSO)

- Once authorised the articles shall be ETSO marked
- The classification and approval of minor changes and repairs can be undertaken by the ETSO authorisation holder
- A major change or repair requires a new application for an ETSO authorisation
- For an Auxiliary power unit ETSO authorisation a subpart J approval is also required.

Subpart P

PERMIT TO FLY

- Effective from 28 March 2007
- Permit to fly used where the C of A is temporarily invalid or cannot be issued but the aircraft is capable of performing a safe flight
- EASA permit to fly may be issued by competent authority on application or by a production or design organisation with appropriate privileges
- Flight conditions related to safety of design must be approved either by the agency or by an appropriately approved design organisation before issue of a permit to fly.

Subpart Q

PERMIT TO FLY

- Effective from 28 march 2007
- Permit to fly used where the C of A is temporarily invalid or cannot be issued but the aircraft is capable of performing a safe flight
- EASA permit to fly may be issued by competent authority on application or by a production or design organisation with appropriate privileges
- Flight conditions related to safety of design must be approved either by the agency or by an appropriately approved design organisation before issue of a permit to fly.

Subpart Q

IDENTIFICATION OF PRODUCTS, PARTS & APPLIANCES

- Defines how product, parts & appliances should be marked & identified
- In general the identification of parts shall include: name, trademark or symbol identifying the manufacturer; part number and EPA if the design data does not belong to the TC holder (Excluding ETSO)
- Describes specific requirements for: aircraft, aircraft engines, propellers, manned free balloons, critical parts and ETSO articles

What do I need to ...?

SUBPART	POA (Subpart G)	DOA (Subpart J)	Other design
B Type Certificate		Yes	
D Change to TC		Yes	Application may be made direct to Agency for a Minor Change
E STC		Yes	EPA Part Marking
F	Production With POA	Link	Link

What do I need to ...?

SUBPART	POA (Subpart G)	DOA (Subpart J)	Other Design
G POA	Production organisation Approval	Link	Link
H C of A	New aircraft form 52		
I Noise	New aircraft Form 52	Don't forget for design changes	
J DOA		Design Organisation approval	

What do I need to ...?

SUBPART	POA (Subpart G)	DOA (Subpart J)	Other Design
K Parts & Appliances	Applies	Applies	Applies
M Repairs		Yes	Application may be made directly to the agency for a minor repair
O ETSO	Yes	APU only otherwise Aps apply	ETSO holder may approve minor changes
P Permit to fly	May issue with privilege	May issue with privilege	Design flight conditions approved by EASA or DOA

What do I need to ...?

SUBPART	POA (Subpart G)	DOA (Subpart J)	Other design
Q Identification	Applies	Applies	Applies
A General provisions	Applies	Applies	Applies

Requirement references

- All of the requirements mentioned in the presentation are directly downloadable from the internet.
- Part 21 – EASA Website (be careful with revision standards!)
- BCAR – CAA website – publications – CAP553

Further training

- Specific CAA training courses are available via CAA international, open to UK and overseas organisations, regulators and individuals wishing to seek or maintain approvals:
 - Part 21 subpart J design organisation approval
 - Part 21 subpart G production organisation approval
 - Audit techniques
 - Preparation for MoD DAOS Surveillance

Questions?