

EASA Regulatory structure

Design and maintenance related to airworthiness

Gorham
Atlanta
workshop

J.H.A. van den
Elshout
Compliance
Verification
Engineer within
KLM EASA DOA

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Disclaimer

- These slides are for training purposes only and are a derivative from original regulation content at time of preparation of this workshop
- KLM is not in any way responsible for the data, or the opinions presented
- For formal purposes use original regulation text as published by the authorities

Note:

- Contents limited to commercial civil aviation
 - **Only** Initial + Continuing airworthiness
 - Airport and airspace regulations not included
 - Limited to large aircraft
- If You have a version with note pages: These notes contains parts of original regulation content based on data as published in 2013. Also this data is for training purposes only and not necessary the latest data

Contents

- Regulating bodies / jurisdictions:
 - ICAO, EASA, FAA etc.
- Structure jurisdiction EASA
 - Law EU + EASA decisions
 - Initial airworthiness
 - Part 21 design + production
 - Continuous airworthiness
 - Part M continuing airworthiness
 - Part 145 maintenance organisation
 - Part 66/147 Certifying staff/training
- Relation EASA – FAA
 - Bilateral agreements
 - differences between FAA and EASA

Regulating Bodies

Aviation is an international Industry and requires an international Fundament



INTERNATIONAL CIVIL AVIATION ORGANIZATION
A United Nations Specialized Agency

ICAO

<http://www.icao.int/Pages/default.aspx>

ICAO International Civil Aviation organisation

Key Objectives:

- **Aviation safety + security,**
 - Incl. regulation, accident investigation and SMS
- **Environmental + sustainable development of air transport**
 - Incl. emission and noise requirements

History:

- **Treaty of Paris of 1919**
- **Created by 1944 Chicago convention (United Nations)**
- **ICAO started in 1947.**
- **191 states connected**

Jurisdiction:

- **ICAO treaties have no jurisdiction, but**
 - content is written into national law and regulations
- **National Aviation Regulation jurisdictions follow ICAO International agreed standard**

Note:

- Reciprocal tax exemption between member states

National Aviation regulating jurisdictions

- **USA** FAA Federal Aviation Authorities
- **Europe**
 - **Up to July 2003**
 - all European countries had their civil aviation jurisdictions
 - JAA (joint aviation authorities) was first step to standardization
 - Joint design + maintenance standard still in national law controlled by local authorities
 - **Present Europe** EASA European Aviation Safety Agency
 - EEC + Iceland, Norway, Switzerland
 - collaboration between European Commission + aviation authorities Member States
 - Replaced jurisdiction role of national authorities,
 - national authorities responsible for supervision / audits
- **China** CAAC Civil aviation authorities China
- **United Arab Emirates** GCAA General Civil Authority
- **Indonesia** DGAC Directorate General Air Common.
- **Singapore** CAAS Civil Aviation Authority Singapore
- etc.

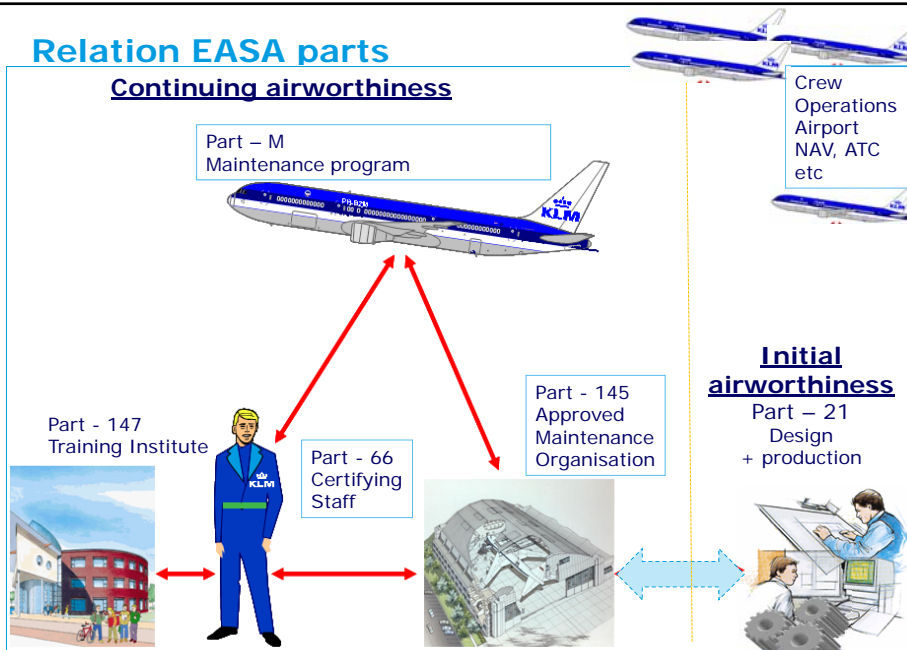
Note: Bilateral agreements exist between governments / states

EASA



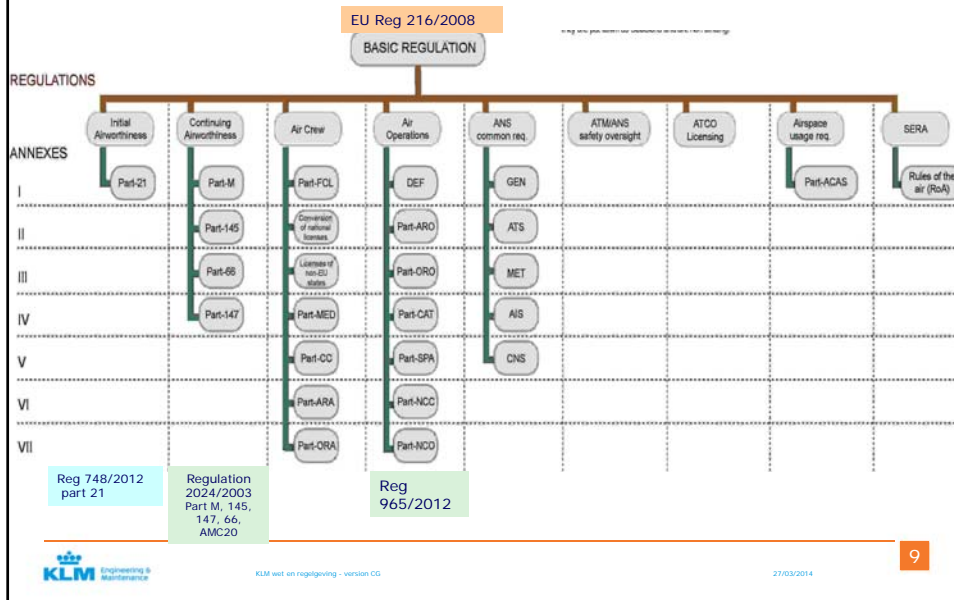
Relation EASA parts

Continuing airworthiness



EASA Rulemaking regulations structure

<http://easa.europa.eu/regulations/regulations-structure.php>



EASA regulation structure airworthiness 2014

Regulating type

Regulating authority

EU law

European Parliament

Implementation rules = EU law

European Commission

Basic regulation
216/2008

Implementation rules
Commission regulation 748/2012

Implementation rules
Commission regulation 2042/2003

Initial Airworthiness
Including environmental cert. + Production
Annex I = **Part 21**

Continuing airworthiness
Annex I = **Part M**
Annex II = **Part 145**
Annex III = **Part 66**
Annex IV = **Part 147**

EASA decisions

EASA decisions

internal EASA

AMC Part 21
 • ED Decision 2012/020/R
 • CS (Certification specs)
 • AMC (Acceptable Means of Compliance)

AMC
 • ED 2003/19/RM
 • GM (Guidance Material)

KLM Engineering & Maintenance

KLM wet en regelgeving - version CG

27/03/2014

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Design + Production PART 21



•Commission regulation (EC) no 748/2012
•Guidance material ED Decision 2012/020/R

J.H.A. van den Elshout
SPL/CG
KLM

-Part 21
-Certification Specs
-Production



Initial Airworthiness = Design + production Part 21

Commission regulation 748/2012 amended by 69/2014
Guidance material ED Decision 2012/020/R

Scope:

- common technical requirements
- administrative procedures for airworthiness + environmental certification of products, parts + appliances

Specifying:

- Issue of
 - airworthiness codes = certification specifications = design requirements
 - type-certificates (TC)+ supplemental type-certificates (STC)
 - certificates of airworthiness, permits to fly + release certificates
 - repair design approvals
 - noise certificates
 - airworthiness directives (AD)
- Show compliance with environmental protection requirements
- certification of design + production organisations (DOA + POA)
- certification of parts + appliances
- Identification (products, parts and appliances)

Part 21 contents

SECTION A TECHNICAL REQUIREMENTS

- **SUBPART A — GENERAL PROVISIONS**
- **SUBPART B — TC AND RESTRICTED TC (Type Certificate)**
 - (SUBPART C — NOT APPLICABLE)
- **SUBPART D — CHANGES TO TC AND RESTRICTED TC**
- **SUBPART E — STC (SUPPLEMENTAL TYPE-CERTIFICATES)**
- **SUBPART F — PRODUCTION WITHOUT POA**
- **SUBPART G — POA (PRODUCTION ORGANISATION APPROVAL)**
- **SUBPART H — CERTIFICATES OF AIRWORTHINESS + RESTRICTED CERTIFICATES OF AIRWORTHINESS**
- **SUBPART I — NOISE CERTIFICATES**
- **SUBPART J — DOA (DESIGN ORGANISATION APPROVAL)**
- **SUBPART K — PARTS AND APPLIANCES**
 - (SUBPART L — NOT APPLICABLE)
- **SUBPART M — REPAIRS**
 - (SUBPART N — NOT APPLICABLE)
- **SUBPART O — ETSO (EUROPEAN TECHNICAL STANDARD ORDER)**
- **SUBPART P — PERMIT TO FLY**
- **SUBPART Q — IDENTIFICATION OF PRODUCTS, PARTS + APPLIANCES**

SECTION B PROCEDURES FOR COMPETENT AUTHORITIES

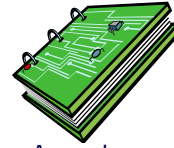
Industry terms

- **PRODUCT**
 - Aircraft, Engine, Propeller
 - their design requires a type certificate
- **TC Type Certificate**
 - Design approval of a product
- **STC Supplemental Type Certificate**
 - Design approval of a major change to a product
- **TC basis**
 - Amendment level of certification specs used for Type Certificate
- **Appliance**
 - any instrument, equipment or accessory used in operating an aircraft in flight, but is not part of airframe, engine or propeller
- **Certification**
 - Legal recognition that such a product, service, organisation or person complies with applicable requirements
- **Maintenance**
 - overhaul, repair, inspection, replacement, modification or defect rectification of an aircraft or component
 - except pre-flight inspection



EASA Certification specifications

<http://easa.europa.eu/agency-measures/certification-specifications.php>
multiple ED decisions; Initial issues + amendments



CS-22	Sailplanes and Powered Sailplanes
CS-23	Normal, Utility, Aerobatic and Commuter Aeroplanes
CS-25	Large Aeroplanes
CS-27	Small Rotorcraft
CS-29	Large Rotorcraft
CS-31HB	Hot Air Balloons
CS-34	Aircraft Engine Emissions + Fuel Venting = ICAO
CS-36	Aircraft Noise refers to ICAO
CS-APU	Auxiliary Power Units
CS-AWO	All Weather Operations
CS-E	Engines
CS-ETSO	European Technical Standard Orders
CS-Definitions	Definitions and Abbreviations
CS-P	Propellers
CS-VLA	Very Light Aeroplanes
CS-VLR	Very Light Rotorcraft
AMC-20	General Acceptable Means of Compliance for Airworthiness of Products, Parts and Appliances

EASA Design approvals

Part 21

- Type Certificate (TC) Subpart B
 - Design approval of a product
 - Changes to the TC by TC holder Subpart D
 - Non TC holder**
 - Major subpart E
 - Minor through agency or DOA subpart J
- Supplemental type-certificate (STC) Subpart E
 - Design approval of major change to a product
- Design organisation approval (DOA) Subpart J
 - normal approach for
 - type certification,
 - supplemental type certification
 - approval of changes to type design
 - approval of repair design
- European Technical Standard Orders (ETSO) Subpart O

Approval and compliance

Part21

Approval of a design, repair or change requires:

- compliance with
 - TC basis
 - Related to specific certification specification revision
 - environmental protection requirements
 - amendments to those certification specifications
 - special conditions in the Type Certificate
- Submittal of all necessary substantiation data
- Declare compliance with certification specifications and environmental protection requirements
 - Latest (CS) requirements except if impractical but not older than TC basis

TC Type Design

Part 21 Subpart B

The Type Design of a product consists of:

- Drawings + specifications showing compliance with
 - type-certification basis*
 - environmental protection requirements
- Information on materials, processes and methods of manufacturing and assembly
- approved airworthiness limitations section of the instructions for continued airworthiness (chapter 5)
- Data necessary to allow
 - determination of airworthiness,
 - characteristics of noise,
 - fuel venting
 - exhaust emissions.

*TC basis = Amendment level of certification specs used for Type Certificate
– specific revision of design requirements

Type Certificate (TC)

Part 21 Subpart B



Document certifying a Product

The "Type Certificate" includes

- type design
- Type Certificate Data Sheet (TCDS) to document the design basis
- operating limitations
- applicable type-certification basis + environmental protection requirements + other conditions or limitations.

The aircraft TCDS includes **noise**

The engine TCDS includes **emission** compliance

TC holder is responsible for the type design of complete product

- including all work done by subcontractors

TC holder has to publish

- Changes (service bulletins)
- Maintenance manuals incl. inspection and Repairs

Supplemental type certificate (STC)

Part 21 Subpart E

System for major changes

Requirements:

- Similar to requirements TC holder
- **But non TC holder parts have obligation for part marking by "EPA marking"**

Part 21 DOA: Design organisational Approval Subpart J

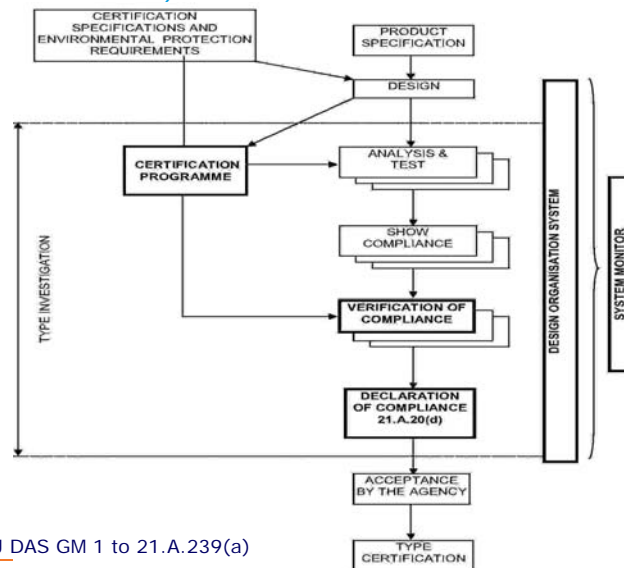
EASA approved organisation responsible for **design** of

- products, parts, appliances and/or
- changes or repairs

Privileges: Design activities within its scope of approval. (21.A.263)

- Classify changes + repairs as 'major' or 'minor'
- Approve minor changes and minor repairs (under Subpart D)
- Issue compliance documents to obtain:
 - approval of flight conditions required for a permit to fly
 - TC, STC or ETSO authorisation
 - major repair design approval
- Issue information or instructions containing the **formal DOA statement**:
 - *'The technical content of this document is approved under the authority of DOA ref. EASA. 21J. [XXXX]'*
- Approve minor revisions to aircraft flight manual + supplements,
- Approve major repair design to products or APU for which it holds (S)TC or ETSO
- Approve the conditions under which a permit to fly can be issued
- Issue permit to fly for aircraft it has designed or modified, or for which it has approved the conditions under which the permit to fly can be issued

DOA: RELATIONSHIPS BETWEEN DESIGN, DAS (DESIGN ASSURANCE) + TYPE INVESTIGATION



Subpart J DAS GM 1 to 21.A.239(a)

PART 21 PARTS AND APPLIANCES SUBPART K

Compliance of parts + appliances

to be installed in a type-certificated product shall be :

- in conjunction with the type-certification procedures of
 - Subpart B (TC),
 - Subpart D (changes to TC) OR
 - Subpart E (STC) for the product in which it is to be installed;

or

- where applicable, under the ETSO authorisation procedures (Subpart O)

or

- in the case of standard parts, in accordance with officially recognised Standards.

21.A.303

Classification of changes + repairs PART 21

- Minor change
 - No **appreciable effect** on mass, balance, structural strength, reliability, operational characteristics, noise, fuel venting, exhaust emission, or **other characteristics affecting airworthiness of the product**.
 - all other changes are “major changes”
 - Minor changes shall be classified and approved (21.A.95) either:
 - by the Agency **or**
 - by an appropriately approved design organisation (DOA)
 - Major change
 - Approval by agency
 - Declaration by DOA (recommend for approval)
 - Repair classification in accordance criteria “change of design”

Notes:

- “airworthiness” is interpreted in the context of a product
 - in conformity with type design and
 - in condition for safe operation

21.A.91 + 21.A.435

Appreciable effect

Part 21

A change has

“appreciable effect” on

“other characteristics affecting airworthiness of the product” and should be classified **major**

when one or more of following conditions are met:

- Requires adjustment of TC
- New interpretation of requirements used for TC basis,
- Demonstration of compliance uses methods not previously accepted as appropriate for
 - the nature of the change or
 - similar changes to other products designed by applicant.
- Extent of new substantiation data is considerable.
- The change alters airworthiness and / or operating limitations.
- The change is
 - made mandatory by an AD or
 - terminating action of an AD.
- The change introduces or affects functions where failure effect is classified catastrophic or hazardous.

GM 21.A.91

Risk assessment during design

Probability of occurrence		Severity of occurrence				
		Negligible	Minor	Major	Hazardous	Catastrophic
		1	2	3	5	8
Extremely improbable	1					
Improbable	2					16
Remote	3					
Occasional	4					
Frequent	5					

Examples of major Changes per discipline

PART 21 Appendix A to GM 21.A.91

Sections of list for complete list see ref.) Subpart D appendix A to GM21.A91

1. Structure Changes

- such as cargo door cut-out, fuselage plug, change of dihedral, addition of floats;
- to materials, processes or methods of manufacture of primary structural elements, such as spars, frames and **critical parts**;
- that adversely affect fatigue, damage tolerance or life limit characteristics
- that adversely affect aeroelastic characteristics.

6. Engines Changes:

- that adversely affect operating speeds, temperatures, + other limitations.
- that affect or introduce parts (identified by CS E-510) where the failure effect has been shown to be hazardous.
- that **affect** or introduce engine **critical parts** (CS E-515) or their life limits.
- to a structural part which requires a re-substantiation of the fatigue + static load determination used during certification.
- to any part of the engine which adversely affects the existing containment capability.
- that adversely affect fuel, oil and air systems, which alter method of operation, or require reinvestigation against the TC basis.
- that introduce new materials or processes, (particularly on critical components)

9. Power plant Installation Changes which include:

- control system changes which affect the engine/propeller/airframe interface;
- new instrumentation displaying operating limits;
- modifications to the fuel system and tanks (number, size and configuration);
- change of engine/propeller type

Critical parts

PART21

No EASA definition in part 21 but statements in EASA faq

<http://www.easa.europa.eu/rulemaking/faq/commission-regulation-1702-2003-initial-airworthiness.php>

- **Rotorcraft:** the failure of it could have a catastrophic effect
- **Engines:** means a part that relies upon meeting prescribed integrity specifications of CS-E 515 (engine critical parts) to avoid its Primary Failure, which is likely to result in a Hazardous Engine Effect. (CS-E 15)
- **EU-US bilateral:** a part identified as critical by the design approval holder during product type validation process, or otherwise by the exporting authority. Typically, such components include parts for which **a replacement time, inspection interval, or related procedure is specified in the Airworthiness Limitations section** or certification maintenance requirements of the manufacturer's maintenance manual or Instructions for Continued Airworthiness

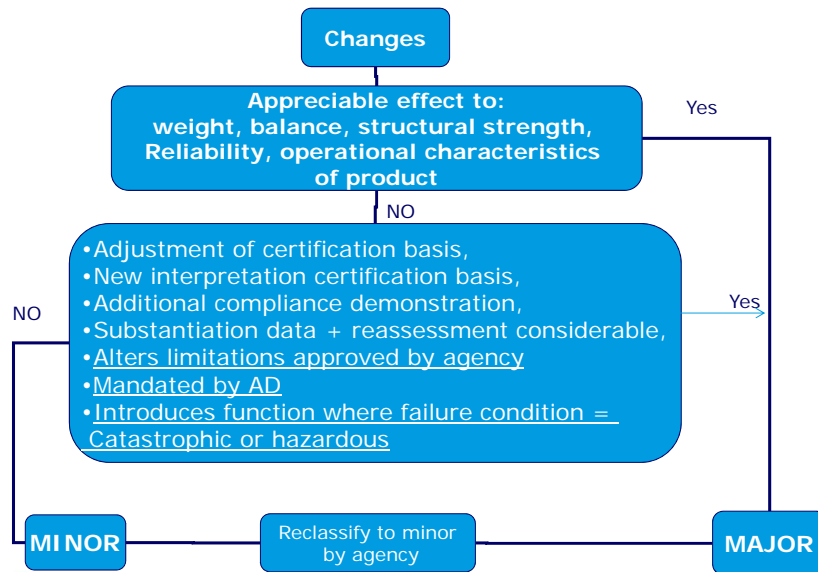
Repairs to engine or APU critical parts would normally only be accepted with the involvement of the TC holder (AMC 21.A.433)

Note:

Some OEM's created "Critical Influencing Parts".

- These are NOT critical parts,
- this is not EASA/FAA approved text in Airworthiness Limitations section;
- also no replacement time or inspection interval specified
- Refers to formal FAA guidance in place by AC 33-8 and 33-9

Classification of changes (21A.91)



Repair

Part 21 Subpart M 21A.431

Elimination of damage and/or restoration to airworthy condition

- Elimination of damage by replacement without design activity is maintenance task and does not require design approval.

Repair design approval

through

- the Agency = EASA
- the (S)TC holder,
- DOA

Approved data

- Published in "instructions for continued airworthiness"
- data which is approved either by the Agency, (S)TC holder or by DOA

Notes

- classification in accordance with the criteria for change in the type design.
- When a repaired product is released into service before fatigue + damage tolerance evaluation is completed, release should be for a limited service period, defined at issue of repair.
- A repair of a TSO except APU is a change to the product
- A maintenance organisation may manufacture parts for repair purposes according approved data + procedures. **(21.A.439)**

Production of Repair Parts

Part 21 Subpart K 21.A.439

Parts + appliances to be used for the repair shall be **manufactured** in accordance with data based upon design data as provided by repair design approval holder:

- under **Subpart F (production without POA)**;
 - issuance of a POA inappropriate; or
 - certification / approval of a part under this Subpart is needed pending issuance of a POA

or

- by an organisation appropriately approved in accordance with **Subpart G (POA)**;

or

- by an **appropriately approved** maintenance organisation

Production Organisational Approval (POA)

Part 21 Subpart G

- Scope
 - Production approval process for organisations producing
 - aeronautical products, parts, appliances and/or materials
 - intended for airborne use
 - as part of a type-certificated product
- Requirements POA
 - POA – DOA contractual relation (21A.4)
 - Approved design (drawings, specifications + other technical information)
 - procedure manual = POE (production organisation exposition)
 - Quality system, Facility, equipment, personnel + management etc

Part 21 **Subpart F** Production without POA when

- POA under Subpart G would be inappropriate; or
- certification / approval of a product, part or appliance is needed pending issuance of a POA under Subpart G
 - limited duration not exceeding one year
 - manufacturer of a product, part or appliance being manufactured under Subpart F shall make each product, part or appliance available for inspection

Standard parts

Part 21 Subpart K 21.A.303

Specified by an approved design

- Do not requiring EASA form 1 release certificate
- 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 recognized Standards**”

“officially recognized Standards”

- Those standards established or published by an official body, which are widely recognized by the air transport sector as constituting good practice

e.g.: NAS, AMS etc.

European Technical Standard Order (ETSO)

Part 21 Subpart O 21.A.602B

ETSO items / components are used and certified for multiple aircraft types / independent from TC

E.g.: safety belts, APU

- ETSO is a detailed airworthiness specification issued by the Agency as a minimum performance standard for specified articles incl. the Auxiliary Power Unit.
- ETSO authorisation requires separate approvals for
 - Production,
 - POA, issued in accordance with Subpart G,
 - or temporary through compliance with Subpart F procedures
 - Design:
 - for an APU holding a DOA;
 - for all other articles using procedures setting out the specific design practices, resources and sequence of activities necessary to comply with this Annex I (Part 21).

EPA European Part Approval

Part21

Article produced in accordance with approved design data not belonging to the TC holder of the related product

– except for ETSO articles

- Holders of **repair** or **change** design approvals (DOA, STC) are required to specify "**EPA**" marking for added parts

21.A.109 + 21.A.804

Airworthiness directives

Parts 21 21A.3B

AD NOTES:

Issued or adopted by the Agency which mandates actions to be performed on an aircraft to

- restore an acceptable level of safety,
- when evidence shows that the safety level of this aircraft may otherwise be compromised

When authority of a (EASA) Member State receives an airworthiness directive from authority of a non-member State, that airworthiness directive shall be transferred to the Agency for dissemination (21B.60)

Permit to fly

Part 21



Issued to aircraft that

- do not meet airworthiness requirements but
- are capable of safe flight under defined conditions
- for following purposes:
 - Development + Showing compliance with regulations or certification specs.
 - Design or production organisations crew training
 - Production flight testing new aircraft
 - Flying aircraft under production between production facilities
 - Flying aircraft for customer acceptance, delivering or exporting
 - Flying aircraft for Authority acceptance
 - Market survey, including customer's crew training, exhibition, air show
 - Flying aircraft to location for maintenance, airworthiness review, storage
 - Flying aircraft at weight in excess of max. certificated takeoff weight
 - flight beyond normal range
 - Before conformity to environmental requirements
 - Record breaking, air racing
 - if cert. of airworth. not appropriate; non-commercial/complex; only owner

instructions for continued airworthiness

Part 21

Examples of part 21 created ICA data

- Manufacturers Structural Repair Manual,
- Maintenance / Engine Manuals provided by the holder of
 - the TC and STC,
 - design approval or
 - ETSO authorisation as applicable

Publication requirement ICA for Holder of TC (21.A.61) and minor change approval (amendment 21.A.107)

- furnish ICA / amended ICA to
 - each known owner of one or more aircraft, engine or propeller upon its delivery or upon issue of the first certificate of airworthiness for the affected aircraft, whichever occurs later
 - and thereafter make those instructions available on request to any other person required to comply with any of the terms of those instructions.

Records

Part 21

Design

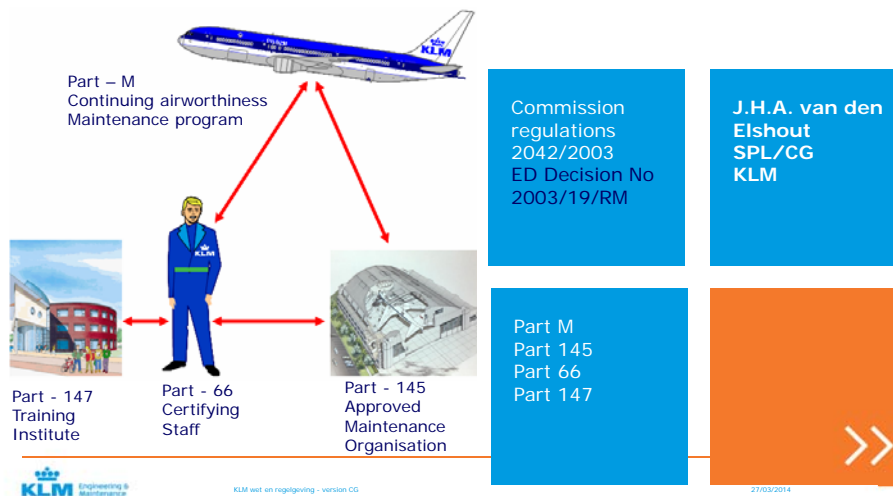
- All relevant design information, drawings, test reports, incl. inspection records for product tested, shall be held by the TC holder at the disposal of the Agency and shall be retained (throughout life) in order to provide the info. necessary to ensure
 - the continued airworthiness,
 - continued validity of the operational suitability data and
 - compliance with applicable environmental protection requirements of the product

Production

- Data which supports production conformity of a product, part, or appliance should be kept for not less than 3 years from the issue date of the related Statement of Conformity or Authorised Release Certificate. (POA)
- Data considered essential for continuing airworthiness (design related, departures etc.) should be kept throughout operational life of the product, part or appliance.

Note: See also requirements for records for part M and part 145

Continuing Airworthiness PART M/145/66/147



continuing airworthiness

Commission regulations 2042/2003 + ED Decision No 2003/19/RM

Scope:

- Ensure **continuing** airworthiness of aircraft, incl. component by
 - *Technical* requirements +
 - administrative procedures

Contents:

- Continuing airworthiness part M
 - Operator responsibilities
- Maintenance organisation approvals part 145
 - maintenance of large commercial aircraft + components
- Certifying staff part 66
- Training part 147

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2003R2042:20120801:EN:PDF>

http://easa.europa.eu/agency-measures/docs/agency-decisions/2003/2003-019-RM/decision_ED_2003_19_RM.pdf

Continuing Airworthiness Part M



Requirements for air operations :

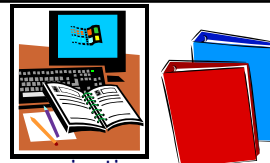
- Aircraft Maintained in airworthy condition
- Emergency equipment
- Certificate valid
- Maintenance according approved maintenance program

- Occurrence reporting system
 - condition which endangers flight safety

2042/2003 ANNEX I (Part-M) M.A.201

Aircraft maintenance program

PART M



Approved by

- authorities or
- through Continuing Airworthiness Management organisation – “CAMO” approved by authorities
 - Requires authority approved CAME (=Exposition Manual)

The aircraft maintenance programme must establish compliance with instructions for airworthiness issued by:

- competent authority
 - Including AD = airworthiness Directives
- holders of approved design data
 - TC + STC,
 - major repair design approval,
 - ETSO authorisation
 - relevant part 21 approvals (e.g. DOA)
- Instructions from
 - Owner
 - CAMO once approved

2042/2003 M.A. 302

PART M records required for operator



Revision pending per NPA 2014-04

- Detailed maintenance records of aircraft + life limited components
 - until superseded by new but not less than 36 months after release
- Total time in service of aircraft + life-limited components,
 - at least 12 months after aircraft or component is withdrawn from service
- Time in service since last scheduled maintenance of life limited component
 - at least until scheduled maintenance is superseded by other scheduled maintenance
- Current status of compliance with maintenance programme
 - at least until aircraft or component scheduled maintenance superseded by other scheduled maintenance
- Current AD status
 - at least 12 months after aircraft or component permanently withdrawn
- Details of current modifications + repairs to aircraft, engine, propeller and any other component vital to flight safety
 - at least 12 months after they have been permanently withdrawn

Maintenance organisation



Part 145

Objective

- common technical requirements + administrative procedures ensuring continuing airworthiness of aircraft, including components

Scope **145.A.10**

- Establishes requirements to be met by an organisation to qualify for the issue or continuation of an approval for the maintenance of aircraft and components

Maintenance

- overhaul, repair, inspection, replacement, modification, defect rectification of an aircraft or component, with the exception of pre-flight inspection



Authority oversight:

- designated authority of member state
- Non EASA country, authority = the Agency = EASA

Component status

part 145

- Components meeting requirements
 - released on an EASA Form 1 or equivalent
- Unserviceable components
 - require maintenance per Part 145
- Unsalvageable components AMC 145.A.42(d)
 - Require mutilation
- Standard parts
 - According industry specs + COC
- raw / consumable material
 - documentation containing conformity to specification
 - traceability to manufacturing / supplier
- Components with reached certified life limit AMC 145.A.42(d)
 - Require mutilation

Notes

- Ensure component is eligible for the configuration
- Part 145 organisation may fabricate certain parts to be used in work within its own facilities AMC 145.A.42(c)
 - requires procedures in MOE and approved design

Applicable Maintenance data

part 145

Consisting of:

- Applicable requirements, procedures, operational directives or information issued by authority responsible for oversight
- airworthiness directives
- Instructions for continuing airworthiness (ICA), issued by
 - TC holders (manuals, service bulletins etc)
 - STC holders,
 - any other organisation required to publish such data by Part-21
 - authority from third countries responsible for the oversight
 - Mandated airworthiness data for aircraft or components
- applicable standards
 - such as maintenance standard practices recognized by Agency as good standard for maintenance
- Part 145 initiated changes if
 - Fully equivalent and without design
- operator/customer controlled and provided maintenance data

EC No. 2042/2003 145.A.45 (b)

Part 145 maintenance records

Revision pending per NPA 2014-04

- Record all details of maintenance work.
 - Records necessary to prove all requirements are met for issuance of certificate of release to service incl. subcontractor's release documents.
- Provide copy of each certificate of release to service to aircraft operator, together with copy of any specific **approved** repair/modification
- Retain copy's of all detailed maintenance records + any associated maintenance data for 3 years from the date the aircraft or component to which the work relates was released.
 1. These Records shall be stored in a manner that ensures protection from damage, alteration + theft.
 2. Computer backup discs, tapes etc. shall be stored:
 - in a different location from that containing the working discs, tapes etc.,
 - in an environment that ensures they remain in good condition.

Notes

- "Associated maintenance data" = specific info. such as repair + modification data (manuals+SB)
- Maintenance records should refer to the revision status of the data used.
- AMC 145.A.42 (d) clause g. "The following types of components should typically be classified as unsalvageable: Components for which maintenance records and/or traceability to the manufacturer can not be retrieved".

GM + AMC 145.A.55

Part 66 / Part 147 Certifying staff and Training

Part 66 certifying staff

- Privileges
 - cat A Line maintenance certifying mechanic
 - Cat B1 Maintenance certifying technician – mechanical
 - Cat B2 Maintenance certifying technician - avionic
 - Cat C Base maintenance certifying engineer
- Type ratings
 - Always Required if TO mass above 5700kg

Training per Part 147 required



Law and Regulations related to air traffic Relation between EASA and FAA

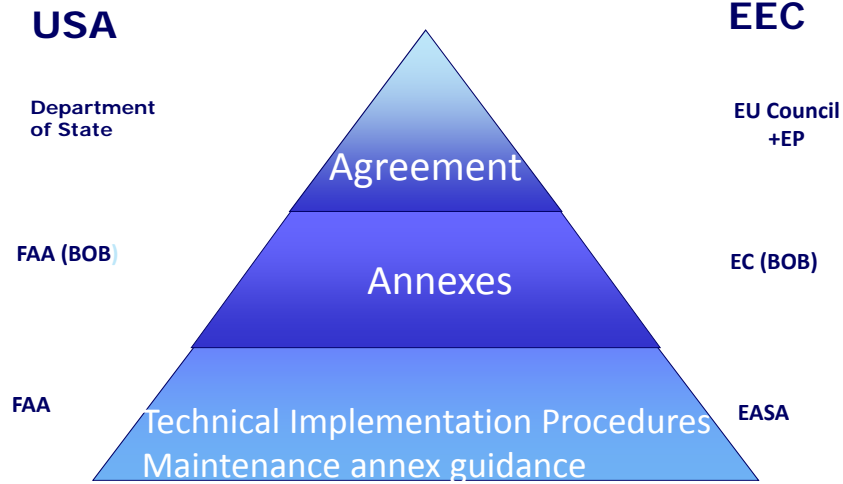


- Bilateral agreements
- Differences between EASA and FAA

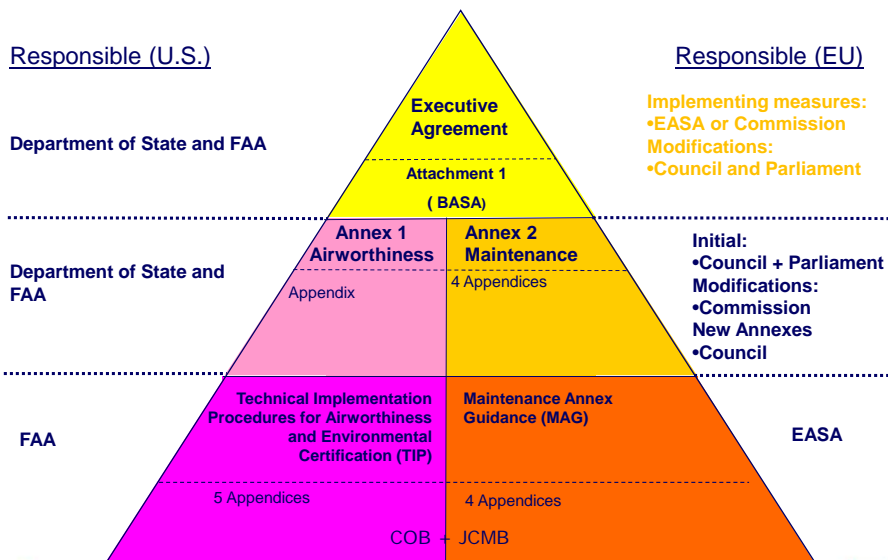
J.H.A. van den Elshout
SPL/CG
KLM



Bilateral agreement USA-EEC (FAA-EASA)
in place since May 1 2011



The construction of the USA-EEC BASA - Responsibilities



BASA FAA EASA effective May 1 2011

Specifics of agreement:

- reciprocal acceptance of safety findings in 14 EEC countries and USA
 - design
 - Aircraft and part manufacturing
 - continued airworthiness
 - repair station oversight
- Future US acceptance of EEC aeronautical products from all member states, beyond current 14 with individual agreements with US
- Bilateral oversight board to manage implementation

<http://easa.europa.eu/rulemaking/international-cooperation-bilateral-agreements.php>

Implementation procedures design + production

POST DESIGN APPROVALS Covered by Technical Implementation Procedures (TIP R3)

- FAA Major non critical repair design data accepted by EASA if
 - FAA is authority of State of Design
 - FAA repair design data approval through one of following options
 - FAA letter,
 - FAA Form 8110- 3, FAA Form 8100-9,
 - FAA Form 337 or a
 - Signed cover page of a repair specification (RS DER)
- FAA minor
 - EASA accepts data used in support of minor repairs when:
 - EASA has certificated/validated the product or appliance, **and**
 - the FAA is authority of State of Design for the repair design data, **and**
 - the repair design data has been provided by a U.S. TC, STC or TSOA holder, or
 - for minor repairs from other than a U.S. TC / STC or TSOA holder, the determination that data are acceptable (under 14 CFR Part 43) has been made by a U.S. maintenance organization under FAA's authorized system.

Note:

Unless minor repair data was previously used to repair an N-registered aircraft, an EU company cannot determine any data to be acceptable data under 14 CFR Part 43 for use on an EU-registered aircraft

– An EU company must use EASA Part 21 for approval of repair data for use on an EU-registered aircraft.



Differences FAA versus EASA

Differences FAA versus EASA

- FAA121 (big USA operators) is comparable to EASA Part M + FAA minor design approvals
 - all design in EASA is limited to part 21
- Difference in Major / minor definition resulting in certain FAA majors classified as EASA minor
- individual DER (Designated Engineering Representatives) acting for FAA process design approval.
 - In EASA this requires an EASA Design Organisation (DOA)
- All EASA design changes (incl repair appr.) require part 21 approval
 - FAA DER is not allowed to approve FAA-minors
 - FAA minor repairs designs are handled by part 43
- System for part approvals of alternative parts "FAA PMA" versus the European EPA option through a DOA and POA

FAA PMA versus EASA EPA



Differences between EASA and FAA

J.H.A. van den Elshout
SPL/CG
KLM

PMA = Part Manufacturing approval



Part manufacturing FAA PMA versus EASA EPA

FAA PMA

PMA – Part Manufacturing Approval

- Production + design approval (one document)
- Approved direct by FAA
- Published through FAA records
- Production by PMA holder

Note:

- EASA acceptance by bilateral for US products except critical parts

EASA EPA

EPA EASA Part Approval

- Production approval for a part designed by EASA DOA
- No direct EASA part approval
- No publication by EASA
- Production by EASA POA or EASA 145 repair station

Note:

- separate FAA acceptance of **design** and **production** by bilateral

Airworthiness Regulation Links

EASA

- regulation structure
 - <http://easa.europa.eu/regulations/regulations-structure.php>
- Certification specs
 - <http://easa.europa.eu/agency-measures/certification-specifications.php>
- Bilaterals
 - <http://easa.europa.eu/rulemaking/international-cooperation-bilateral-agreements.php>

FAA

- Code of regulations
 - http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&tpl=/ecfrbrowse/Title14/14tab_02.tpl

Acronyms 1

- AD: Airworthiness Directive
- AGM: Advisor & Guidance Material
- AMP: Aircraft Maintenance Program
- AMC: Acceptable Means of Compliance
- AMO: Approved Maintenance Organisation
- ATC: Air Traffic Control
- ATM : Authorization Training Manual
- BOB: Bilateral oversight board
- CAME: Continuous Airworthiness Management Exposition
- CAMO: Continuous Airworthiness Management Organisation
- CFR: Code of Federal Regulations
- COB: Certification Oversight Board
- CS: Certification specification
- CSM: Customer Support Manual
- DOE: Design Organisation Exposition
- EASA: European Aviation Safety Agency
- ED: Easa Decision

Acronyms 2

- EPA: European Part Approval
- ETSO: European Technical Standard Order
- GMM: General Maintenance Manual
- JCMB: Joint Maintenance Coördinaten Board
- IATA: International Air Transport Association
- ICA: Instructions for Continued Airworthiness
- IEM: Interpretative / Explanatory Material
- ICAO: International Civil Aviation Organisation
- MOE: Maintenance Organisation Exposition
- MRI: Maintenance Required Item
- NAA: National Aviation Authority
- NPA: Notice of Proposed Amendment
- NPRM: Notice of Proposed Rule Making
- OEM: Original Equipment Manufacturer
- SB: Service Bulletin
- SMS: Safety Management System
- TCDS: Type Certificate Data Sheet