



EASA
European Aviation Safety Agency

Product Certification and Design Organisation Approval Workshop

22nd -23rd November 2016

Your safety is our mission.

An agency of the European Union 

TE.GEN.00409-001



EASA
European Aviation Safety Agency

DOA Terms of Approval

Fernando Salazar
DOA Team Leader

David Mancebo Pajares
Expert Avionics

Robert Boersma
DOA Team Leader

Antonio Blanco Delicado
Expert Structures

Tomas Ohnimus
Senior Expert Cabin Safety

23rd November 2016

Your safety is our mission.

An agency of the European Union 

TE.GEN.00409-001



DOA Terms of Approval – Table of content

- Objective
- Concepts
- DOA Terms of Approval content
- DOA Terms of Approval tool
- Next steps



DOA Terms of Approval – EASA Working Group

➤ EASA WG No. CT.6/2015-01

➤ Objective:

- **Improved “Terms of Approval” (TOA) content** allowing for a better definition of the design activities for which a Design Organisation Approval has been granted.
- **Harmonisation of TOAs** across all DOAs.

➤ Participation:

- High involvement of EASA Experts, PCMs and DOA Team Leaders.

➤ Timeframe:

- Implementation has started in November 2016
 - DOAs under Initial Investigation: within 3 months
 - DOAs under Surveillance: within 18 months



DOA Terms of Approval – Concepts

- The **scope of work** is related to those aspects of a product (e.g. LA, GA, Rotorcraft, etc.) where a DOA can perform design activity (e.g. TC, changes, repairs, flight condition privilege, permit to fly privilege).
- These aspects might be defined in two levels (only for non-TCH case).
 - **Scope** is the highest level to be defined in the Terms of Approval
 - ▶ Flight
 - ▶ Structures
 - ▶ Cabin
 - ▶ Avionics
 - ▶ Electrical systems
 - ▶ Hydro-mechanical systems
 - ▶ Environmental control systems
 - ▶ Rotor drive systems
 - ▶ Powerplant and fuel systems
 - ▶ Propulsion
 - **Areas** within each scope might need to be identified
 - ▶ [Flight]:
 - ▶ Flight performance
 - ▶ [Structures]:
 - ▶ Fuselage
 - ▶ Wings,
 - ▶ Landing gears, etc.
 - ▶ [Cabin]:
 - ▶ Cabin interiors
 - ▶ Electrical cabin systems
 - ▶ Cargo compartments, etc.
 - ▶ [Avionics]:
 - ▶ Auto Flight systems
 - ▶ Communication systems, etc.



DOA Terms of Approval – Concepts

» The **technical disciplines** are those technical fields where the DOA must have sufficient competence in order to be able to perform design activities for the scope of work. These are defined per EASA panels. E.g.:

» Flight disciplines:

- » Flight Test
- » Handling Qualities & Performance
- » Cockpit Avionics Integration aspects
- » Flight Manual
- » Human Factors

» Structures disciplines:

- » Loads
- » Static strength
- » Fatigue and damage tolerance
- » Materials & Manufacturing
- » Aeroelasticity, Vibration and Buffeting
- » Crashworthiness
- » Rapid decompression
- » Impact conditions

» Cabin Safety disciplines:

- » Occupant crashworthiness/restraint
- » Fire Protection - pressurised areas
- » Occupant evacuation
- » Cargo restraint
- » Security aspects
- » Human External Cargo Restraint
- » Standard cabin interior items
- » Rotorcraft Ditching
- » Special Interior Features

» MMEL

- » Impact assessment / Engineering judgement
- » Detailed Safety Analysis
- » Flight Crew aspects (workload, etc.)



DOA Terms of Approval – Concepts

➤ **Limitations** might be needed to further define the scope of approval. These normally are based on technical disciplines. E.g.:

➤ **Scope: Cabin**

- ▶ **[Structures]**: Primary structure is excluded
- ▶ **[Cabin Safety]**: Seat installation requiring new demonstration of compliance to CS-xx.562 "Emergency landing dynamic conditions" is excluded
- ▶ **[Flight]**: Design activities requiring flight testing are excluded
- ▶ **[OSD]**: Changes affecting OSD are excluded

➤ **Scope: Avionics**

- ▶ **[Development Assurance]**: Development of AEH with IDAL A, B and C is excluded
- ▶ **[Avionics]**: Design activities on systems with catastrophic/hazardous failure conditions are excluded
- ▶ **[Flight]**: Design activities requiring flight testing are excluded
- ▶ **[OSD]**: Development of Operational Suitability Data excludes the OSD constituents MMEL, FCD, CCD, MCSD and SIMD



DOA Terms of Approval – Content

➤ The DOA Terms of Approval will include:

1. **Scope of work**

➤ It will refer to an annex A, which will include:

▶ **Scope of work**

▶ Product/Scope/Area

▶ Type of design work (TC, STC, minor changes, etc.)

▶ **List of types**

▶ **Limitations**

2. **Privileges**

➤ As per 21.A.263

3. **Obligations**

➤ As per 21.A.265



DOA Terms of Approval – Content (example)

Scope of work

	TC	STC	major changes	minor changes	major repairs	minor repairs	flight conditions	permit to fly
Large aeroplane								
Avionics								
Communication systems								
Diagnostic and Maintenance systems								
Indicating, Alerting systems								
Navigation systems								
Recording systems								
Surveillance systems								
Cabin								
All areas								
Small aeroplane								
All scope (TCH)								
All areas								
Avionics (non-TCH activity)								
All areas								



DOA Terms of Approval – Content (example)

List of products and types

Product	Design Activity	Types
Small aeroplane	TC	GA-Type-01 GA-Type-02

Limitations

Common Limitations

[Development Assurance] Development of SW and AEH with IDAL A, B and C is excluded

Product	Product Limitations
Large aeroplane	[Flight] Design activities requiring flight testing are excluded [Structures] Primary structure is excluded
Small aeroplane	None



DOA Terms of Approval – DOA ToA tool

➤ DOA ToA Tool:

- A tool has been developed for the **identification** of the information required to be included in the DOA Terms of Approval.
- This tool is used for both internal and external **communication** during DOA investigations and surveillance.
- It also provides **guidance** on areas related to each product and corresponding technical disciplines where the DOA holder would need to demonstrate competences.



DOA Terms of Approval – DOA ToA tool

21J.NNN (OrganisationName)

Applicable product ☐ **yes**

TCH DOA Activity ☐ **yes**

change ☐ **yes**

minor change ☐ **yes** [Introduce types for TCH]

major repair ☐ **yes**

minor repair ☐ **yes**

flight condition privilege ☐ **yes**

permit to fly privilege ☐ **yes**

Large aeroplane - Non-TCH design activity

Template tool ver

1. Initial view Show all disciplines

2. Applicable products & activity Hide TC DOA activity

3. Applicable scope & activity Show all scope

4. Technical disciplines (Panels) Hide technical disciplines

5. Limitations Hide limitations

6. DOA Terms of Approval tables Show all matrix

Large aeroplane

STC

major changes

minor changes

major repairs

minor repairs

flight conditions

permit to fly

CATEGORY OF PRODUCTS

Common limitations

[Introduce limitations common to all products]

LIMITATIONS

[Panel 1] Flight

[Panel 2] Flight Crew Data (FCD)

[Panel 3] Structures

Loads, Weight and Balance

Static strength

Fatigue and damage tolerance

Materials & Manufacturing

Aeroelasticity, Vibration and Buffeting

Crashworthiness

Decompression

Impact conditions

[Panel 4] Hydromechanical

[Panel 5] Electrical

[Panel 6] Avionics

[Panel 7] Powerplant & Fuel

[Panel 8] Environmental Control Systems

[Panel 9] Environmental Protection

[Panel 10] Software and AEH

[Panel 11] Cabin Safety

[Panel 11] Cabin Crew Data (CCD)

[Panels 4, 5, 6, 7, 8, 11 and 12] ASA

[Panel 13] Helicopter Drive

[Panel 14] Instructions for Continued Airworthiness

[Panel 14] Maintenance Certifying Staff Data (MCSA)

[Panel 15] Master Minimum Equipment List (MMEL)

[Panel 16] Flight Simulation Training Device (FSTD)

[Panel 17] Propulsion

TECHNICAL DISCIPLINES (guidance)

DOA SCOPE / AREAS

Large aeroplane

Small aeroplane

Helicopter

Light aircraft

General aviation

Business aviation

Commercial aviation

Transport aviation

Spacecraft

Unmanned aircraft

Other

21J.NNN (OrganisationName)



DOA Terms of Approval – Next steps

- Next steps
 - Communication with DOAs
 - Implementation to new investigations
 - Implementation to existing DOAs



EASA
European Aviation Safety Agency

Thank you!

Questions?

Your safety is our mission.

An agency of the European Union

