EUROPEAN AVIATION SAFETY AGENCY
AGENCE EUROPÉENNE DE LA SÉCURITÉ AÉRIENNE
EUROPÄISCHE AGENTUR FÜR FLUGSICHERHEIT

DOA and Environmental Protection

Your safety is our mission.

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Background

- Implementation of the requirements for Environmental Protection has been identified as a potential weakness for Design Organisations.

- Smaller DOA Holders especially may have a problem identifying their obligations to Environmental Protection and in complying with the EP regulations.

The Basic Regulation and Environmental Protection

- Article 6 of the Basic Regulation defines EASA's essential requirements for EP as the Chapters of ICAO Annex 16

- CS-34 and CS-36 define EASA GM and AMC in terms of the Appendices of ICAO Annex 16 and the ICAO Environmental Technical Manual (ICAO Doc 9501)

Part 21 and Environmental Protection

21.A.239(a)1

"The design organisation shall demonstrate that it has established…a design assurance system…to enable the organisation…to ensure that the design of the products, parts and appliances or the design change thereof, comply with the applicable type-certification basis, the applicable operational suitability data certification basis and environmental protection requirements."

Part 21 and Environmental Protection

21.A.245(a)

"...the staff in all technical departments are of sufficient numbers and experience...to enable the staff to achieve the airworthiness, operational suitability and environmental protection objectives for the product."

Minimum EP Knowledge for DOA Holders

DOA Holders should have knowledge of

- the EASA EP certification specifications (ICAO Annex 16 Volumes I and II, CS-36 and CS-34)

and

- the associated GM and AMC (the ICAO Environmental Technical Manual)

applicable to the scope of their DOA.

Minimum EP Knowledge for DOA Holders

Staff should have adequate knowledge of EP aspects gained from:

- appropriate professional qualifications
- relevant experience
- attendance at appropriate training courses

Experts and CVEs should be identified in the Design Organisation Handbook.

Minimum EP Knowledge for DOA Holders

DOA Holders should have sufficient knowledge to correctly identify changes that might appreciably affect a changed product's environmental characteristics and therefore enable a correct change classification.

Change Classification

21.A.91(a):

- A Minor Change is one that has no appreciable effect on the…noise, fuel venting [and] exhaust emission …characteristics.

- A change that does have an appreciable affect on the noise, fuel venting or exhaust emissions characteristics is per se a Major Change.

Change Classification

ICAO Annex 16 defines a "derived version" of an aircraft as one which "incorporates changes in type design which may affect its noise characteristics adversely". Such a change in type design is sometimes referred to as an "acoustical change". A change in type design that has no appreciable effect on the product's noise characteristics is a "non-acoustical change" (NAC).

Appendix A to GM 21.A.91 Section 8

- Provides examples of changes that might appreciably affect an aircraft's noise or emissions characteristics
- Explains what is an appreciable effect on noise and emissions characteristics

Noise

DOA holders should have knowledge of ICAO Annex 16 Volume I, specifically:

- Chapters 2, 3 or 4 for jet aeroplanes and “heavy” (greater than 8618 kg TOW) propeller-driven aeroplanes
- Chapters 6 or 10 for “light” (not greater than 8618 kg TOW) propeller-driven aeroplanes
- Chapter 8 for helicopters
- Chapter 11 for “light” (not greater than 3175 kg TOW) helicopters

The applicability provisions for these chapters are generally written in terms of the date of submission of the application for a type certificate or, in the case of an application for a change in type design, the date of submission of the application for approval of a “derived version”.

Engine Emissions

DOA holders engaged in the design of turbojet and turbofan engines should have knowledge of ICAO Annex 16 Volume II, specifically, Part III for engine emissions certification:

- Chapter 2 for turbojet and turbofan engines for propulsion at subsonic speed
- Chapter 3 for turbojet and turbofan engines for propulsion at supersonic speed

The applicability provisions for each of these chapters are somewhat different from other certification requirements. They are written in terms of the date of manufacture of an engine type or model. This is normally interpreted as the date of issue of the TC, amended TC or STC of the engine. In cases where a production cut-off rule applies the date of manufacture of the individual production engine is the date where compliance of the engine with the TC is recorded (e.g. EASA Form 1).

Engine Production Cut-off Requirement

ICAO Annex 16 Volume II Amendment 7 contains a production cut-off requirement stating that the engines produced on or after 1 January 2013 have to comply with at least the NOx stringency level stated in paragraph 2.3.2(d) of Part III Chapter 2 (the CAEP/6 NOx Standard). Under certain circumstances engine manufacturers may apply for exemptions to this requirement; the exemption process is described in the ETM Volume II.

Emissions Requirements Confirmation

Commission Regulation (EU) No 7/2013 introduced the requirement that before a Form 1 or Statement of Conformity can be issued for a completed engine it needs to be confirmed that the engine complies with the emissions requirements applicable on the date of manufacture of that engine.

Fuel Venting

DOA holders engaged in the design of turbojet and turbofan engines should have knowledge of ICAO Annex 16 Volume II, specifically, Part II Chapters 1 and 2 for all turbine engine powered aircraft on the prevention of intentional fuel venting. It is the responsibility of the aircraft TC holder to show compliance with the intentional fuel venting requirements though compliance with the requirements may depend on features embodied in the design of the engine. In such a case the aircraft manufacturer will need to establish links with the engine manufacturer to ensure that the requirements are met when the engine is installed on the aircraft.

Conduct of Environmental Testing

DOA Holders needing to conduct noise and/or emissions testing to acquire certificated noise levels, demonstrate a no-acoustical change or acquire engine emission numbers must have test, measurement and analysis procedures, as well as the necessary test equipment in association with a specific project.