New air mobility

ISSUE 2

Issue/rationale

The current common European regulatory framework for civil aviation safety was initially designed for conventional fixed-wing aircraft, helicopters, balloons, airships, and sailplanes. The existing framework relies on the active contribution of human beings, increasingly assisted by automation, be it on board or on the ground. Propulsion is mostly provided by piston or turbine engines, using fossil fuels.

The introduction of new technologies and air transport concepts (from multimodal vehicles to autonomous vehicles) requires revisiting this framework. The objective of this Rulemaking Task (RMT).0731 is to address new technologies and operational air transport concepts by adapting, where necessary, the regulatory framework. A general principle that governs this RMT is that future requirements should be technology-neutral, where possible, e.g. performance-based instead of prescriptive, while ensuring legal certainty.

This RMT includes the following three streams of activities (Subtasks):

— Continuing Airworthiness (CAW) rules for electric and hybrid propulsion aircraft and other non-traditional aircraft (Subtask 1);
— Aircrew and Air Operations rules for gyroplanes (Subtask 2); and
— Aircrew, Airspace Usage, and Air Operations rules for tilt rotors (Subtask 3).

Note: this draft RMT.0731 Issue 2, introduces Subtasks 2 and 3 for consultation with the European Aviation Safety Agency’s Advisory Bodies (EASA ABs). ToR RMT.0731 Issue 1 on Subtask 1 was published on 9 September 2020 following consultation with the EASA ABs.

Domain: New technologies and concepts
Related rules: SubT 1: Regulations (EU) Nos 1321/2014 and 748/2012 and related AMC & GM
Affected stakeholders: SubT 1: Persons and organisations involved in CAW and organisations involved in the type certification of the affected aircraft
SubTs 2 and 3: Pilots, instructors, examiners, operators, and training organisations for gyroplanes; competent authorities
Driver: Safety
Rulemaking group: No
Impact assessment: No
Rulemaking Procedure: SubTs 1 & 2: Standard
SubT 3: Accelerated

EASA rulemaking process milestones

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1. **Why we need to change the rules — issue/rationale**

**General introduction to RMT.0731 ‘New air mobility’**

The current common European regulatory framework for civil aviation safety (Regulation (EU) 2018/1139, the ‘Basic Regulation’)

1 was initially designed for conventional fixed-wing aircraft, helicopters, balloons, airships, and sailplanes, and assumes that propulsion is mostly provided by piston or turbine engines, using fossil fuels. The introduction of new technologies and air transport concepts (from multimodal vehicles to autonomous vehicles) requires revisiting this framework. The objective of this Rulemaking Task (RMT).0731 ‘New air mobility’ is to address new technologies and operational air transport concepts by adapting, where necessary, the regulatory framework. A general principle that governs this RMT is that future requirements should be technology-neutral, where possible, e.g. performance-based instead of prescriptive, while ensuring legal certainty.

This RMT includes the following three streams of activities (Subtasks2).

1.1. **Subtask 1 — Continuing Airworthiness rules for electric and hybrid propulsion aircraft and other non-traditional aircraft**

The first issue has been defined for continuing airworthiness requirements for electric and hybrid propulsion aircraft and other non-traditional aircraft with a conventional propulsion system. The activities in the context of this issue need to be coordinated with those of RMT.0230 ‘Introduction of a regulatory framework for the operation of drones’.

EASA has already received a number of applications for type certification of small non-traditional aircraft. The current continuing airworthiness (CAW) framework is not adequate for these applications due to the electrical or hybrid propulsion systems of some of these aircraft, which are not covered under the current rules. Some other stakeholders have submitted to EASA applications for type certification of aircraft with conventional powerplants (piston, turboprop or turbine) but which do not belong to traditional aircraft categories (i.e. airplane, helicopter, balloon, glider, airship) that are considered in the current CAW rules.

In particular, Regulation (EU) No 1321/20143 does not explicitly take into consideration hybrid or electrically driven aircraft since these rules were written assuming aircraft propulsion with piston or turbine engines. The type of engine is sometimes explicit in the rule and this creates unintended consequences for hybrid or electrically driven aircraft. In addition, some of the provisions of the rule are applicable to different aircraft categories and there are no provisions for aircraft that fall outside these categories.

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2 Exemptions will be considered in the domains covered by Subtask 1 of this RMT.

Also, the definition of complex motor-powered aircraft (CMPA) classifies as ‘complex’ those aeroplanes equipped with turbine engine(s). This may be adequate to classify, by omission, piston engine aircraft as ‘non-complex’, but may not be adequate for aircraft with electrical engine(s).

Not adapting to those new technologies would create a large detrimental impact with respect to the competitiveness of the EU industry from a worldwide perspective.

**High-level gap analysis for CAW requirements**

At the time Regulation (EU) No 1321/2014 was developed, electrical propulsion was not considered. This leads to gaps in the Regulation which would need to be fixed to create a framework that would cover also electrical propulsion. Such gaps are, for instance:

- with regard to the possible scope of approval for maintenance organisations (all approvals), for the class ‘Engine’, there is no adequate rating for electrical engines, since the only possible ratings are: turbine, piston and APU. The same applies for the choices regarding the scope of approval of training organisations that are subject to Part-147.

- when it comes to the full aircraft, considering the title of the Part-66 licenses on categories A, B1, and B3, these are not suitable for electrical aeroplanes or helicopters. Electrical propulsion is not considered in the Part-66 Basic Knowledge syllabus.

- electrical engine aircraft are not considered when establishing the training levels for each aircraft type in Appendix III of Part-66, except for some ‘L’ subcategories.

Also, the existing rules do not take into consideration non-traditional aircraft. This is apparent for Part-66 licenses, but also other Parts of Regulation (EU) No 1321/2014 need to be adapted.

In addition, the rule contains provisions that were introduced with the intention to alleviate small aircraft from having to comply with more stringent requirements. These alleviations were introduced for piston-engine aircraft but could also be made applicable for electrically driven and some non-traditional small aircraft. An example of an existing alleviation is the possibility for independent Part-66 license holders to release to service some maintenance tasks on an ELA1 for piston-engines.

The issue identified in this stream will be addressed under subtask 1 of this RMT.

**Related safety issues (if applicable)**

Not applicable.

**Alternative means of compliance (AltMoC) relevant to the content of this RMT (if applicable)**

Currently there are no alternative means of compliance (AltMoCs) having an impact on the development of this RMT.

**ICAO and third-country references relevant to the content of this RMT (if applicable)**

Not applicable.
1.2. Subtask 2 — Aircrew and Air Operations rules for gyroplanes

According to the Basic Regulation, gyroplanes with a maximum take-off mass (MTOM) of more than 600 kg fall within the scope of the common European rules in the field of civil aviation. Gyroplanes with an MTOM of 600 kg or less are still addressed by national rules.

The airworthiness of the design of gyroplanes is certified within the scope of the common European rules, but without suitable operational rules in the following regulatory domains:


Note: the CAW rules for gyroplanes are addressed by Subtask 1 of this RMT (see Section 1.1).

The lack of suitable European rules for the operation of gyroplanes with an MTOM of more than 600 kg hinders their introduction and operation, thus deteriorating the competitiveness of the EU industry that is willing to develop such gyroplanes.

This issue is addressed by Subtask 2 of this RMT.

Related safety issues

Not applicable.

Alternative means of compliance (AltMoC) relevant to the content of this RMT

Currently, there are no alternative means of compliance (AltMoC) that have an impact on the development of this RMT.

ICAO and third-country rules relevant to the content of this RMT

Not applicable.

1.3. Subtask 3 — Aircrew, Airspace Usage, and Air Operations rules for tilt rotors

The airworthiness of the design of tilt rotors is certified within the scope of the common European rules, but:

4 ‘Gyroplane’ means a heavier-than-air aircraft that is supported in flight chiefly by one or more non-engine-driven rotors.

5 Gyroplanes fell within the scope of Annex II of Regulation (EC) No 1592/2002 (the ‘first Basic Regulation’). When said Regulation was repealed and replaced by Regulation (EC) No 216/2008, Annex II excluded gyroplanes with an MTOM of less than 560 kg. According to point 1(f) of Annex I to the current Basic Regulation, single and two-seater gyroplanes with an MTOM not exceeding 600 kg are not subject to the Regulation. Such aircraft have to comply with the applicable national rules of the respective Member States (MSs).


8 According to the International Civil Aviation Organization (ICAO), tilt rotors belong to the ‘powered-lift’ aircraft category. ICAO defines a tilt rotor as follows: ‘A powered-lift capable of vertical take-off, vertical landing, and sustained low-speed flight, which depends principally on engine-driven rotors mounted on tiltable nacelles for the lift during these flight regimes and on nonrotating aerofoil(s) for lift during high-speed flight.’
— the existing rules for powered-lift aircraft of the Aircrew Regulation do not fully address tilt rotor aircraft needs;
— Airspace Usage rules were not developed for tilt rotors; and
— there are no operational rules for tilt rotor aircraft in the Air OPS Regulation.

The issue identified is addressed by Subtask 3 of this RMT.

Note: the CAW rules for tilt rotors are addressed by Subtask 1 of this RMT (see Section 1.1).

Related safety issues

Not applicable.

Alternative means of compliance (AltMoC) relevant to the content of this RMT

Currently there are no alternative means of compliance (AltMoC) that have an impact on the development of this RMT.

ICAO and third-country references relevant to the content of this RMT

Not applicable.

2. What we want to achieve — objectives

The overall objectives of the EASA system are defined in Article 1 of Regulation (EU) 2018/1139. This project will contribute to the achievement of the overall objectives by addressing the issues outlined in Chapter 1.

The specific objectives of this RMT are to establish the necessary legal framework:
— to ensure the continuing airworthiness of electric and hybrid propulsion aircraft;
— to introduce rules for flight crew licensing for, and operation of, gyroplanes and tilt rotors, thereby ensuring a uniform application of the essential requirements of the Basic Regulation to such aircraft;
— more generally, to support the development of new technologies and non-traditional aircraft; and
— to support the competitiveness of the EU industry.

3. How we want to achieve it

Subtask 1 — Continuing Airworthiness rules for electric & hybrid propulsion aircraft and other non-traditional aircraft

EASA expects to achieve this by:
— potentially drafting new requirements in Part-21, to mandate stakeholders to develop any information that persons or organisations involved in the continuing airworthiness of aircraft would need in order to fulfil their obligations.
During the development of the draft rules, the following activities will be taken into account:

— Perform detailed gap analysis of the target rules to identify where the rules are prescriptive regarding references to particular aircraft categories or systems used.

— Consider different possibilities to prevent that certain aircraft or aircraft using certain technologies are excluded from the rule, by proposing technology-neutral rules.

— Assess if those provisions in the rule that alleviate certain aircraft from complying with certain requirements could also be extended to those aircraft that were initially not considered.

**Subtask 2 — Aircrew and Air Operations rules for gyroplanes**

EASA expects to achieve the objectives of this Subtask by introducing new implementing rules (IRs) and related acceptable means of compliance and guidance material (AMC & GM) in:

— the Aircrew domain; and

— the Air OPS domain.

To that end, EASA will:

— review the available information gathered so far to prepare the draft rules;

— perform a gap analysis between the Aircrew and Air OPS rules for aeroplanes and rotorcraft and those for gyroplanes; and

— consider international standards/best practice of training in, and operation of, gyroplanes.

**Subtask 3 — Aircrew, Airspace Usage, and Air Operations rules for tilt rotors**

ICAO document 10103 ‘Guidance on the Implementation of ICAO Standards and Recommended Practices for Tilt-rotors’ advises that, in general, helicopter rules should be applied to tilt rotors with the exception of certain areas where aeroplane rules should be applied instead of or in conjunction with helicopter rules. With regard to tilt rotor aircraft, EASA expects to achieve the objectives of this Subtask by:

— amending Aircrew IRs and related AMC & GM;

— amending IRs of Regulation (EU) No 1332/2011 (the ‘Airspace Usage Requirements (AUR) — ACAS II Regulation’\(^9\)) and related AMC & GM; and

— drafting new Air OPS IRs and related AMC & GM.

To that end, EASA will review the available information gathered so far to prepare the draft rules.

4. **What are the deliverables**

**Subtask 1 — Continuing Airworthiness rules for electric & hybrid propulsion aircraft and other non-traditional aircraft**


— An Opinion proposing amendments to Regulation (EU) No 1321/2014 and Part 21 of Regulation (EU) No 748/2012 based on the proposal consulted in the NPA and considering the comments received; and

— A Decision amending the AMC and GM to Regulation (EU) No 1321/2014 and to Regulation (EU) No 748/2012 based on the proposal consulted in the NPA and considering the comments received.

Subtask 2 — Aircrew and Air Operations rules for gyroplanes

— An NPA to propose amendments to the Aircrew and Air OPS Regulations, and to the related AMC & GM.

— An EASA Opinion to amend the Aircrew and Air OPS Regulations based on the NPA consultation and the comments received.

— An ED Decision to amend the AMC & GM to the Aircrew and Air OPS Regulations based on the NPA consultation and the comments received.

Subtask 3 — Aircrew Airspace Usage, and Air Operations rules for tilt rotors

— An NPA to propose amendments to the the Aircrew, Airspace Usage, and Air OPS Regulations, and to the related AMC & GM.

— An EASA Opinion to amend the Aircrew, Airspace Usage, and Air OPS Regulations based on the NPA consultation and the comments received.

— An ED Decision to amend the AMC & GM to the Aircrew, Airspace Usage, and Air OPS Regulations based on the NPA consultation and the comments received.

5. How we consult

Subtask 1 — Continuing Airworthiness rules for electric & hybrid propulsion aircraft and other non-traditional aircraft

For this Subtask, a public consultation will take place through an NPA in accordance with Article 7 of the Rulemaking Procedure 10.

Subtask 2 — Aircrew and Air Operations rules for gyroplanes

For this Subtask, a public consultation will take place through an NPA in accordance with Article 7 of the Rulemaking Procedure.

Subtask 3 — Aircrew, Airspace Usage, and Air Operations rules for tilt rotors

The draft proposed rules for this Subtask were part of a preliminary consultation with the EASA Advisory Bodies (ABs), i.e. Member States (MSs) and other affected stakeholders. The draft proposed

10 EASA Management Board Decision N°18-2015 of 15 December 2015 replacing Decision 01/2012 concerning the procedure to be applied by the Agency for the issuing of opinions, certification specifications, acceptable means of compliance and guidance material (‘Rulemaking Procedure’).
rules, based on the outcome of that AB consultation, are considered non-controversial, mature, and affecting a limited group of stakeholders only, who have also contributed to the drafts. Therefore, a focused consultation (e.g. technicals workshop or meetings with the affected stakeholders) will take place in accordance with Article 16 of the Rulemaking Procedure\textsuperscript{11}.

6. Interface issues

Subtask 1 — Continuing Airworthiness for electric & hybrid propulsion aircraft and other non-traditional aircraft

EASA will establish adequate coordination with rulemaking task RMT.0230 ‘Introduction of a regulatory framework for the operation of drones.

Subtask 2 — Aircrew and Air Operations rules for gyroplanes

N/a.

Subtask 3 — Aircrew, Airspace Usage, and Air Operations rules for tilt rotors

N/a.

7. Reference documents

7.1. Subtask 1 — Continuing Airworthiness for electric & hybrid propulsion aircraft and other non-traditional aircraft

7.1.1 Related regulations


7.1.2 Related decisions

— Decision N°2012/020/R of the Executive Director of the Agency of 30th October 2012 on acceptable means of compliance and guidance material for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations (‘AMC and GM to Part 21’) repealing decision No 2003/01/RM of the Executive Director of the Agency of 17 October 2003


\textsuperscript{11} Article 16 ‘Special rulemaking procedure: accelerated procedure’.

7.2. Subtask 2 — Aircrew and Air Operations rules for gyroplanes

7.2.1 Related regulations
— Aircrew


— Air OPS


7.2.2 Related decisions
— Aircrew


— Air OPS

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7.3. Subtask 3 — Aircrew, Airspace Usage, and Air Operations rules for tilt rotors

7.3.1 Related regulations

— Aircrew


— Airspace Usage


— Air OPS


7.3.2 Related decisions

— Aircrew


— Air OPS


— Decision No 2013/021/Directorate R of the Executive Director of the Agency of 23 August 2013 on adopting Acceptable Means of Compliance and Guidance Material for Non-commercial operations with complex motor-powered aircraft (Part-NCC)


7.4. Reference documents