



Explanatory Note to Decision 2014/001/R

Amendment 12 to AMC-20

RELATED NPA/CRD 2012-02 — RMT.0001 (20.002) — 29.01.2014

EXECUTIVE SUMMARY

This Decision addresses technological and operational issues related to the use of Electronic Flight Bags (EFB) during flight operations, as outlined in the Terms of Reference (ToR) RMT.0001 (20.002) of 4 December 2006.

The specific objectives of this task were to issue:

- a new AMC 20-25 on the airworthiness and operational criteria of Electronic Flight Bags (EFBs) used by Commercial Air Transport (CAT) operators; and
- a new version of ETSO-C165a on Airport Moving Map Display (AMMD).

This Decision contains Amendment 12 to AMC 20, limited to introduction of AMC 20-25, covering both airworthiness and operational criteria for EFB.

A separate Decision is planned to introduce ETSO-C165a into CS-ETSO.

The introduction of AMC 20-25, replacing and modernising JAA TGL 36 (published in 2004) is expected to increase safety, operational flexibility and economic efficiency of Commercial Air Transport (CAT) operators by following the latest developments of the state of the art concerning EFB.

The radical changes in respect to TGL 36 are:

- supported by the reactions to CRD 2012-02;
- endorsed during the 'focused consultation', held in the form of a Workshop on 18 April 2013; and
- harmonised with parallel ICAO and FAA developments.

Applicability		Process map	
Affected regulations and decisions:	AMC-20	ToR	14.01.2007
Affected stakeholders:	Applicants for Agency airworthiness approvals or evaluation of EFB; Commercial Air Transport (CAT) operators	Concept Paper:	No
Driver/origin:	Technological development	Rulemaking group:	Yes
Reference:	JAA TGL 36 of 01 October 2004	RIA type:	Light
		Technical consultation during NPA drafting:	No
		Publication date of the NPA:	12.03.2012
		Duration of NPA consultation:	3 months
		Review group:	Yes
		Focussed consultation:	Yes (Workshop 18.04.2013)
		Publication date of CRD:	31.07.2013

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1. Procedural information

1.1. The rule development procedure

The European Aviation Safety Agency (hereinafter referred to as the 'Agency') developed ED Decision 2014/001/R in line with Regulation (EC) No 216/2008¹ (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure².

This rulemaking activity is included in the Agency's Rulemaking Programme for 2012-15 under RMT.0001 (20.002)³. The scope and timescale of the task were defined in the related Terms of Reference published on 14 January 2007.

The draft text of this Decision has been developed by the Agency, supported by a Rulemaking Drafting Group (to prepare the NPA). All interested parties were consulted through NPA 2012-02⁴. 913 comments were received from 45 interested parties, including world-wide industry, FAA, TCCA and EU National Aviation Authorities.

The Agency has reviewed the comments received on the NPA supported by a Review Group and through a 'focused consultation', in the form of a Workshop for members of the Regulatory Advisory Group (RAG) and of the Safety Standards Consultative Committee (SSCC) held on 18 April 2013. The comments received and the Agency's responses are presented in the Comment-Response Document (CRD) 2012-02⁵.

The final text of this Decision with Amendment 12 of AMC 20 has been developed by the Agency, taking into account the 32 reactions received on the CRD.

The process map on the title page summarises the major milestones of this rulemaking activity.

1.2. Structure of the related documents

Chapter 1 contains the procedural information related to this task. Chapter 2 explains the core technical content. The newly introduced AMC-20-25 is annexed to the ED Decision.

¹ Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC. (OJ L 79, 19.03.2008, p. 1). Regulation as last amended by Commission Regulation (EU) No 6/2013 of 8 January 2013 (OJ L 4, 9.1.2013, p. 34).

² The Agency is bound to follow a structured rulemaking process as required by Article 52(1) of the Basic Regulation. Such process has been adopted by the Agency's Management Board and is referred to as the 'Rulemaking Procedure'. See Management Board Decision concerning the procedure to be applied by the Agency for the issuing of opinions, certification specifications and guidance material (Rulemaking Procedure), EASA MB Decision No 01-2012 of 13 March 2012.

³ <http://easa.europa.eu/rulemaking/docs/tor/20/EASA-ToR-20.002-00-14012007.pdf>

⁴ In accordance with Article 52 of the Basic Regulation and Articles 5(3) and 6 of the Rulemaking Procedure.

<http://easa.europa.eu/rulemaking/docs/npa/2012/NPA%202012-02.pdf>

⁵ <http://easa.europa.eu/rulemaking/docs/crd/2012/CRD%202012-02.pdf>

2. Explanatory Note

2.1. Overview of the issues to be addressed

Portable Electronic Devices (PED) like Personal Computers (PC) but also 'smartphone', 'iPhone', 'iPad', 'tablet', 'GPS navigator' and similar have become more powerful and progressively lighter and smaller year after year. Since a couple of decades, they are used in the cockpit, under the expression 'Electronic Flight Bag' (EFB), to replace paper carried on board (e.g. charts, manuals, etc.) to support the crew to perform calculations (e.g. fuel to destination, mass and balance, landing distance and else) or even to present the aircraft position (obtained thanks to satellite navigation) on a moving map (e.g. at aerodromes) to increase situational awareness.

Like any new technology, while EFB provides clear benefits to operators and pilots, mainly in terms of economy and flexibility of operations, it may, nevertheless, pose new safety risks to aviation. In the first place, commercial electronic hardware is not certified for aviation use and so its reliability is not defined. This means that a given functionality may be lost any moment. Secondly, this hardware may pose risks to the aircraft (e.g. explosion of the batteries or interference with the aircraft avionics). Thirdly, although the hardware may be 'portable', this does not exclude some connections to installed aircraft systems (e.g. power supply, use of aircraft printers or radios, exchanges of data with avionics) which of course have to be considered during the airworthiness certification processes. Furthermore, even if all the risks related to the hardware have been mitigated, the use of EFB during flight may still pose operational hazards (e.g. limitation of the movements of the pilot; 'head down' time; accumulation of workload with other tasks and so on).

The Federal Aviation Administration (FAA), in September 2002, having acknowledged the issues mentioned above, published the Advisory Circular 120-76 offering comprehensive guidance for the airworthiness and operational approval of EFB. The document proved almost immediately to be overtaken by the events, and, therefore, a new edition 'A' was released in March 2003. In October 2004, the European Joint Aviation Authorities (JAA) issued the Temporary Guidance Leaflet (TGL 36).

This TGL has so far constituted the principal guidance to European aviation authorities when receiving applications to use EFB by commercial air transport (CAT) operators. The Agency in 2007 launched this rulemaking activity, mainly focusing on the transposition of TGL 36. While the related drafting group was working, technology and applications continued to evolve. Therefore, quite some time elapsed before NPA 2012-02 was published in March 2012.

As directed by the legislator (ref. Art. 5.6 and 8.6 B.R.), the text of said NPA was aligned with the state of the art (evolved in the eight years elapsed from publication of TGL 36) and harmonised as much as possible with envisaged new edition 'B' of FAA AC 120-76 (issued 01 June 2012). In other words, the text proposed in the NPA was significantly different from JAA TGL 36. This discrepancy raised concern from certain stakeholders, especially those looking at the past instead of to the future.

Also, the FAA announced the intention of publishing a 'change 1' to their Advisory Circular (ed. B) and later a subsequent new edition 'C', to align its provisions on EFB with the evolving state of the art.

As a result, the NPA triggered a considerable number of comments (921) mainly split among those fearing any change to practices established on the basis of TGL 36 and those finding the Agency's proposals still lagging behind the present and foreseen state of the art. The first meeting of the Review Group (August 2012) shared the need to align the future Agency's rules to the present and foreseen state of the art, even if departing from

TGL 36 and instead pursuing maximum possible harmonisation with announced edition 'C' of mentioned FAA AC. This approach was endorsed by the Workshop on 18 April 2013.

Meanwhile, also ICAO has progressed work on the matter, proposing new standards in Annex 6⁶, as developed in a subgroup of the OPS Panel. These new standards are expected to be adopted by ICAO Council in 2014 Q1. The text of this Decision is consistent with these standards.

Hence, the Agency hereby issues the new AMC 20-25 to align EU regulatory provisions with the latest industry developments in the field of EFB.

2.2. Objectives

The overall objectives of the EASA system are defined in Article 2 of the Basic Regulation. This proposal will contribute to the achievement of the overall objectives by addressing the issues outlined in paragraph 2.1.

The specific objective of this Decision is, therefore, to harmonise guidance on EFB for EU competent authorities, aircraft and equipment manufacturers and CAT operators with the current and foreseen state of the art, with emerging ICAO standards and with planned edition 'C' of FAA AC 120-76.

2.3. Outcome of the consultation

913 comments were received from 45 commentators on NPA 2012-02 and the individual responses to each of them were published in CRD 2012-02.

The majority of the received comments have been accepted or partially accepted:

	Accepted	Partially accepted	Noted	Not accepted	Total
Sums	227	337	170	179	913
%	25%	37%	19%	19%	100.0%

Based on these comments and the individual responses to each of them, the Agency, supported by the Review Group and by the Workshop in April 2013, concluded that:

- stakeholders agreed with the earliest possible publication of AMC 20-25;
- the stakeholders also proposed major modifications to the text proposed by the NPA, which were incorporated in the resulting text published in the CRD:
 - EFB Hardware Taxonomy:
 - removal of classes (1,2,3);
 - EFBs are either 'installed' or 'portable'; and
 - introduction of the notion of 'Viewable Stowage'.
 - EFB Software Application Types:
 - AMMD converted into Type B; and
 - removal of Type C (non-EFB) 'approved' software applications.
 - new guidance material for performance applications, EFB administrator, and risk assessment;

⁶ ICAO State Letter type I AN 11/1.1.28-13/46 of 15 July 2013.

- no explicit mention of either operational approval or evaluations by the Agency; and
- clarification that the lists of examples for Type A and B applications are not exhaustive.

The focussed consultation, in the form of a Workshop at the level of Regulatory Advisory Group (RAG) and Safety Standards Consultative Committee (SSCC) held on 18 April 2013, noted that evaluations by the Agency and explicit mention of operational approval have been removed from the resulting text of AMC 20-25, recommended:

- to offer the possibility of requesting the service by the Agency (which remains available on a voluntary basis) not only to competent authorities and aircraft manufacturers, but also to aircraft operators and EFB system suppliers;
- to accelerate RMT.0601 to produce an Opinion and so introduce more comprehensive rules on EFB in Commission Regulation (EU) No 965/2012 in line with the amendment to ICAO Annex 6 expected in 2014;
- to explore, beyond the scope of rulemaking, the possibility for the Agency to promote exchange of experiences on EFB and to host a database (e.g. suitable models of portable EFB; suitable batteries; etc.).

2.4. Summary of the Regulatory Impact Assessment (RIA)

The following four options were considered in the RIA:

0. **Do nothing** which means that the Agency will approve the EFB aspects linked to airworthiness and OSD, while the competent authorities at national level will continue to use JAA TGL 36 for operational approval of EFB.
1. **Transpose JAA TGL 36 into AMC 20-25** without changing its technical content.
2. **Enhance and amend the material existing in JAA TGL 36** to align it with current state of the art and in parallel propose to add a new rule to 'EASA-OPS' for progressive migration of the provisions into the structure of Agency's rules.
3. Issue AMC 20-25 containing the airworthiness requirements for EFB and a **separate set of AMCs to the 'EASA-OPS'** for the operational approval.

The four options were comparatively assessed using the Multi-Criteria Analysis (MCA) methodology. Option 0 ('do nothing') and Option 1 ('no changes to TGL 36' = 'obsolete rules') proved to be clearly the least appropriate, showing a significantly negative score, including in terms of safety.

The remaining two options exhibited a positive total (weighted) score and were equivalent and positive also in terms of safety. Among them, however, Option 2 had the highest total score and, in particular, it was the most favourable in terms of regulatory harmonisation (i.e. progressive alignment with the structure of Agency's rules for the 'total system').

Therefore, Option 2 was the preferred one.

No stakeholder objected that Option 2 (i.e. enhance and amend the material existing in JAA TGL 36 to align it with current state of the art and propose as soon as appropriate a new rule to 'EASA-OPS'⁷) was the most appropriate.

2.5. Reactions to the CRD

The Agency received 32 reactions to CRD 2012-02 from seven stakeholders, covering in total 54 items. Seven items concerned general aspects. Only three of them were relevant:

⁷ Currently progressed through RMT.0601.

all these three reactions (Airbus, DGAC-France and UK CAA) expressed full support with the resulting text of the proposed rules, while proposing no changes to the text.

The other 47 items extracted from the reactions can be grouped into two categories:

- 30 items addressing AMC 20-25; and
- The remaining 17 addressing ETSO-C165a.

The latter items will not be discussed in this Explanatory Note, but deferred to the Note accompanying the Decision to amend CS-ETSO.

None of the 30 items challenged the issuance of AMC 20-25 or the approach proposed by the CRD. They all concerned details of the specific lines or paragraphs.

About half of the items concerning AMC 20-25 could not be accepted by the Agency since they represented minority views in respect of the consultation and the subsequent Review Group deliberations and focused consultation.

About a quarter of the items concerning AMC 20-25 were noted, meaning that the intent was fully shared by the Agency, but in fact the topic was already covered somewhere else in the text.

The last quarter of items were accepted, leading, however, to editorial changes to the text to improve precision or clarity but without dramatically changing the technical content.

In conclusion, general support for the rapid publication of AMC 20-25 and for its technical content emerged from the reactions to the CRD

2.6. Overview of AMC 20-25

Of course any rule issued by the Agency will not invalidate existing EFB approvals issued on the basis of TGL 36. The new guidance should, however, also be opened towards future evolution.

The principles on which the new AMC 20-25 is based are that:

- safety remains the prime objective of the Agency and of all commercial aviation stakeholders. This means that the impact of any possible hazard stemming from EFB and their use has to be assessed and, where necessary, mitigated, either during the design and production phases or during operational assessment and, where necessary, approval;
- a mandatory process for operational approval in the EU regulatory framework cannot be established at the level of AMC/GM; a new task (RMT.0601) is hence being activated to establish, where necessary, such approval process in the AIR-OPS, following the amendment of Part I of ICAO Annex 6 which is envisaged in 2014;
- the proposed AMC 20-25 contains airworthiness criteria for any aircraft (e.g. certification basis developed from CS-25 or any other CSs);
- ,however, for the operational aspects, AMC 20-25 applies only to Commercial Air Transport (CAT) operators;
- therefore the proposed operational rules do neither apply to aerial work/specialised operations (commercial or not, as regulated by Part-SPO) nor to any sort of non-commercial activity (recreational or business, as regulated by Part-NCC and Part-NCO);
- the hardware ‘classes’ (three in TGL 36) which had caused confusion in recent years will disappear in order to classify the EFB hardware host platforms in only two variants: ‘portable’ or ‘installed’;
- the ‘portable’ is allowed some connectivity with aircraft systems;

- the software applications are classified according to the severity of their possible failure conditions (and not linked to prescriptive lists which might soon be overtaken by further developments);
- where the safety effects are estimated negligible, the certified operator, in order to improve the cost-efficiency of the regulatory processes (ref. Art. 2.2.(c) of Basic Regulation), would have the 'privilege' of directly approving them but remaining obliged to notify the change to the competent authority;
- not only competent authorities, but also industry stakeholders may apply, on a voluntary basis, to obtain an EFB evaluation by the Agency.

3. References

3.1. Related regulation

- a) Regulation (EC) No 216/2008 Regulation (EC) No 216/2008 of 20/02/2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/E (OJ L 79, 19/03/2008, p. 1).
- b) Commission Regulation (EU) No 748/2012 of 03/08/2012 laying down implementing rules 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 (OJ L 224, 21.8.2012, p.1-85).
- c) Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 296, 25.10.2012).

Basic Regulation and Implementing Rules:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2008R0216:20091214:EN:PDF>

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:224:0001:0085:EN:PDF>

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:296:0001:0148:EN:PDF>

3.2. Affected decisions

ED Decision 2003/12/RM of 05 November 2003.

3.3. Reference documents

See paragraph 3 of AMC 20-25.