Certification Memorandum

Airplane Flight Manual revisions for changes in mass with and without effect on the certified noise levels

EASA CM No.: CM–21.A-D-004 Issue 02 Rev. 1 issued 13 September 2023

Regulatory requirement(s): 21.A.91 in conjunction with paragraph 3.6(b)(1) and paragraph 8 of the Appendix to GM 21.A.91

In accordance with the EASA Certification Memorandum procedural guideline, the European Union Aviation Safety Agency proposes to issue an EASA Certification Memorandum (CM) on the subject identified above.

All interested persons may send their comments, referencing the EASA Proposed CM Number above, to the e-mail address specified in the 'Remarks' section, prior to the indicated closing date for consultation.

EASA Certification Memoranda are intended to provide guidance on a particular subject and, as non-binding material, may provide interpretative material. Certification Memoranda are provided for information purposes only and must not be misconstrued as formally adopted Acceptable Means of Compliance (AMC) or as Guidance Material (GM). Certification Memoranda are not intended to introduce new certification requirements or to modify existing certification requirements and do not constitute any legal obligation.

Log of issues

Issue	Issue date	Change description
01	24.08.2020	First Issue
02	24.03.2021	Final Issue of CM post consultation including correction of reference number, because the Issue 1 was published under the incorrect ref. CM-21.A-D-003.
02 Rev. 1	13.09.2023	Correction of header to delete “Notification of a Proposal to issue a”.

Table of Content

1. Introduction

1.1. Purpose and scope

The purpose of this Certification Memorandum (CM) is to provide specific guidance, limited to large aeroplanes (CS 25), for the approval of aeroplane flight manual (AFM) revisions that introduce administrative mass changes such as:

— A mass reduction within the already EASA approved envelope without the change to the noise certificate (existing noise certificate remains valid); or
— A mass reduction to a specific mass already approved and with requested credit for the associated reduced noise levels (the existing noise certificate can be replaced, listing the new data).

It is intended to clarify the GM 21.A.91 paragraph 3.6(b)(1) on how to classify the above-mentioned changes and the procedure to be followed for applying to EASA. Applications for approval of AFM changes that introduce administrative mass changes are typically made in order that the Operator can benefit from lower air traffic control (ATC) charges, lower airport landing charges or access to airports at which the aeroplane might otherwise be excluded from operation. The EASA Form 45for the individual aircraft noise certificate is not the document used to attest to the MTOM and/or MLM of the aeroplane, as the AFM is the official document defining the aeroplane's certified mass envelope.

Point 21.A.41[1] of Annex I (Part 21) of Regulation (EU) No 748/2012 states that the Type Certificate (TC) and restricted Type Certificate (RTC) include the type design, operating limitations and Type Certificate data sheet (TCDS) for airworthiness and emissions, and that in addition the TC and RTC both include the Type Certificate data sheet for noise (TCDSN). As per point 21.B.425 European National Airworthiness Authorities (NAAs[2]) issue individual noise certificates (EASA Form 45) to aeroplanes on their registers in accordance with the information published in the EASA TCDSNs and EASA published noise databases. This information includes the masses and the associated certified noise levels.
It is reminded that the data related to certified noise levels in the EASA noise database is published by EASA to support the European NAAs in their duties to issue individual noise certificates. Such data may not be used by third parties as the sole substantiation for an administrative mass change with requested credit for reduced noise levels.

Note:
An applicant seeking EASA approval of a change in MTOM and/or MLM with an effect on certified noise levels, without having an associated arrangement with the TCH in place, is expected to have appropriately qualified staff for changes affecting environmental protection requirements to be able to create the necessary substantiation from own resources.

1.2. To whom this CM is addressed to

This guidance can be applied by European and non-European non-TC holders.

[1] The type-certificate and restricted type-certificate shall include the type design, the operating limitations, the type-certificate data sheet for airworthiness and emissions, the applicable type-certification basis and environmental protection requirements with which the Agency records compliance, and any other conditions or limitations prescribed for the product in the applicable certification specifications and environmental protection requirements. The aeroplane type-certificate and restricted type-certificate shall include, in addition, the applicable operational suitability data certification basis, the operational suitability data and the type-certificate data sheet for noise.

[2] The practice under the FAA system, for instance, is different than the one for the European system, as there are no legal requirements for the FAA to issue individual noise certificates for US registered aircraft.

1.3. Abbreviations

AFM	**A**eroplane **F**light **M**anual
ATC	**A**ir **T**raffic **C**ontrol
CG	**C**entre of **G**ravity
CM	**C**ertification **M**emorandum
CS	**C**ertification **S**pecification
EASA	**E**uropean **U**nion **A**viation **S**afety **A**gency
GM	**G**uidance **M**aterial
MLM	**M**aximum **L**anding **M**ass
MSN	**M**anufacturer's **S**erial **N**umber
MTOM	**M**aximum **T**ake-off **M**ass
NAA	**N**ational **A**irworthiness **A**uthority (of the EU and EASA Member States)
OEM	**O**riginal **E**quipment **M**anufacturer
PCM	**P**roject **C**ertification **M**anager
RTC	**R**estricted **T**ype **C**ertificate
STC	**S**upplemental **T**ype **C**ertificate
TC	**T**ype **C**ertificate
TCDS	**T**ype **C**ertificate **D**ata **S**heet
TCDSN	**T**ype **C**ertificate **D**ata **S**heet for **N**oise
TCH	**T**ype **C**ertificate **H**older
WV	**W**eight **V**ariant

2. Applicability

The guidance described herein is applicable to large aeroplanes for maximum take-off mass (MTOM) and/or maximum landing mass (MLM) related AFM changes that remain within already certified mass limits as per GM 21.A.91 paragraph 3.6 (b)(1).

The following cases are not covered by this CM:

- mass changes outside the approved aeroplane mass limits,
- mass reductions beyond 10 % of those limits,

- mass changes associated with aeroplane noise levels not yet approved by EASA (not recorded in the EASA Noise Database),
- implementation of Customer Service Bulletins instructing the applications of single/dual/multiple weight variants as those Service Bulletins already provide all necessary approved data, supported through related technical demonstration, and instructions needed to perform such change. In this case no application to EASA is required,
- Reversion to previously certified higher masses, however a clarification on how the operators should handle such cases with their competent authority of the member state of registry is given in Chapter 5.

3. Clarification on the classification of administrative mass reduction changes

In accordance with point 21.A.91, changes to a type-certificate are classified as 'minor' and 'major'. A 'minor change' is defined as a change which has no appreciable effect on the mass, balance, structural strength, reliability, operational characteristics, operational suitability data, or other characteristics affecting the airworthiness of the product or its environmental characteristics. All other changes are 'major changes'.

As per GM 21.A.91 paragraph 3.6(b)(1), changes to AFM limitations or procedures that remain within already certified limits (e.g. weight, structural data, noise, etc.) are deemed to be minor.

Experience in certification projects has shown that the wording 'already certified limits' applied to noise can lead to different and open interpretations.

GM are guidance intended to facilitate regulatory uniformity and to provide clarifications that should support the understanding of the rule. Point 21.A.91 states that a minor change is one that has no appreciable effect on, among all, noise, and this cannot be overruled by the GM.

As stated in paragraph 8 of the Appendix to GM 21.A.91, an appreciable effect on noise is considered to be one which exceeds the ICAO criteria for a no-acoustical change; for the definition of a no-acoustical change, refer to the section of the ICAO Environmental Technical Manual, Volume I (ICAO Doc 9501, Volume I – Procedures for the Noise Certification of Aircraft). As a result, when the change induces a variation in noise certification level of more than 0.1 EPNdB of the aircraft, for either an increase or reduction, there is an appreciable effect on noise.

EASA certifies the product noise levels of the aircraft in a given configuration, which are part of the type certificate, as per point 21.A.41 and GM 21.A.90A. In accordance with ICAO Annex 16, noise levels shall be established for MTOM and MLM and the noise certificate shall be issued for individual a/c serial number. The noise certificate can reflect just one aircraft configuration. In fact, the product noise levels approved by EASA are always associated to an individual combination of MTOM/MLM and specific aircraft configuration and constitute a set of discrete values, not an envelope.

In this sense, a change triggering a different noise level reference is an acoustical change having an appreciable effect from the environmental point of view, since beyond 0.1 EPNdB, and should be considered as a major change. In fact, this case falls in the examples of major change provided in the Appendix A to GM 21.A.91 paragraph 8.i, namely the case in which an applicant wishes to take credit for a reduction in noise certification levels with the aim to implement a new aircraft configuration with an appreciable effect on noise.

The EASA TCDSN and the EASA noise database read a unique combination of mass and noise values associated to an aircraft configuration controlled by the associated major change or STC approval. Therefore, each application that requests to re-use an already existing entry in the EASA noise database is considered as a change to the certified noise levels since it introduces a new aircraft configuration in the AFM. It is subsequently reflected in the individual aircraft noise certificate and recorded in the EASA noise database as a new major change or STC approval.

Note: This CM is intended to clarify GM 21.A.91, while EASA is working on a rulemaking task to amend the GM 21.A.91 3.6(b)1.

4. Process for the application and approval of administrative mass reduction changes

4.1. Change Categories

AFM supplements introducing changes to the MTOM and/or to the MLM may remain within already certified **mass** limits, but may still not remain within all already certified limits e.g. in relation to noise levels.

AFM supplements introducing changes to the MTOM and/or to the MLM *that remain within already certified **mass** limits* typically fall into one of the following categories:

Category 1: AFM supplement without change to the Noise Certificate as issued by a competent authority of a member state of registry.

Category 2: AFM supplement with requested credit for the associated reduced noise levels already approved by the Agency and recorded in the TCDS/TCDSN and EASA noise database. A corresponding new noise certificate from a competent authority of a member state of registry is intended to be requested.

The above cases are to be implemented through a change to TC/STC and the outcome of the application is a new EASA-approved AFM or AFM-supplement.

See Chapter 2 for the cases not covered by this CM.

See Appendix II for a flowchart.

4.1.1. Category 1: AFM supplement without change to the Noise Certificate

The scope of this change is for mass reduction approval in an AFM supplement, which remains within the mass limits already contained in the EASA approved mass and CG aeroplane envelope, which potentially decreases the noise levels. However, the applicant does not intend to take credit thereof, and the noise levels associated with the original higher aeroplane mass as certified by EASA are kept valid. Therefore, the individual noise certificate issued by the competent authority of the member state of registry for each aeroplane serial number concerned remains valid and reflects the original higher MTOM. This category 1 change is classified as a minor change[3] since the reduction in mass, as reflected in the AFM, does not have an appreciable effect on the airworthiness or environmental characteristics of the product, as provided for in point 21.A.91. An update of the EASA noise database is not required for category 1 changes. A minor change application to EASA is needed unless the organisation has been granted a privilege to approve minor changes as per point 21.A.263(c)(2).

4.1.1.1. Guidance for Applications

An applicant should use the electronic EASA application portal to apply for a minor change to type certificate related to AFM revisions that contains clear references to the TCDS (mass configuration) and AFM document(s) applicable to the basic aircraft before change.

[3] Refer to GM 21.A.91 3.6(b)(1)

4.1.2. Category 2: AFM supplement with requested credit for the associated reduced noise levels

This category concerns AFM supplements introducing a change to the MTOM and/or to the MLM (contained in the EASA approved mass and CG aeroplane envelope) with the intention to certify this configuration with new, potentially lower noise levels, for the ultimate aim of a subsequent request to the competent authority of the member state of registry for a new noise certificate reflecting a new reduced MTOM and/or MLM. For this category of changes, the certified noise levels for the proposed masses must have already been established by the TC/STC holder in former certification projects, approved and published through the EASA noise database. This category 2 change is classified as a major change[4],[5] since the reduction in mass, as reflected in the AFM, does have an appreciable effect on the environmental characteristics of the product, as provided for in point 21.A.91, considering the guidance in paragraph 8 of the Appendix to GM 21.A.91. The guidance in paragraph 3.6 of the GM 21.A.91 does not apply for the classification, as described in para 3 of this CM. An STC or major change to STC application to EASA is needed unless the organisation has a privilege for the approval of such a change as per 21.A.263(c)(9).

4.1.2.1. Guidance for Applications

An applicant should use the electronic EASA application portal for the approval of Supplemental Type Certificate (STC) or major change to STC.
An applicant proposing a change in noise level due to an administrative MTOM change is expected to present an evidence of an arrangement with the owner of the noise data (usually the TCH) to access and use their proprietary data.

EASA updates the EASA noise database after major change or STC approval (or in the case of an approval under a privilege, the DOA holder communicated the STC approval reference to EASA).

Updates of the EASA noise database, to record new STCs, are performed by EASA.

5. Clarification about reversions to previously certified mass and associated noise levels

In case an operator, following an aircraft mass reduction under the provisions of this CM, may wish to revert an aeroplane back to previously certified higher masses (MTOM and/or MLM), no application to EASA and no subsequent approval is required. The operators have to properly coordinate with their competent authority of the member state of registry and comply with their Air Operator Certificate[6] on how to document and track the reversion of the aeroplane mass and noise levels back to their original status and how this should be properly documented and traced. It is the responsibility of the operator to ensure that the operations manual has been properly updated in accordance with the approved AFM content[7] specific to the selected configuration for the impacted aircraft MSN.

6. Addressee

EASA issues this Certification Memorandum for the approval of AFM revisions related to administrative changes of the aeroplane MTOM and/or MLM and for NAAs issuing noise certificates (EASA Form 45).

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[4] Simple STC for the EASA Fees & Charges regulation may apply
[5] Refer to Appendix A to GM 21.A.91 Examples of major changes per discipline
[6] Reference to Regulation (EU) No 965/2012.
[7] The Minor change or STC could consider the modification and the de-modification instructions of the specific aircraft configuration, including the necessary updates to the AFM content.

7. Remarks

1. Suggestions for amendment(s) to this EASA Certification Memorandum should be referred to the Certification Policy and Safety Information Department, Certification Directorate, EASA. E-mail CM@easa.europa.eu.
2. For any question concerning the technical content of this EASA Proposed Certification Memorandum, please contact:

   Name, First Name: Scaramuzzino, Francesca

   Function: Project Certification Manager

   E-mail: francesca.scaramuzzino@easa.europa.eu

Appendix I

EASA elements for the application form to be used for a MTOM reduction only

1. Reference Data	
1.1 EASA Reference	SAP Project or SAP Sales Order N° (or P-N°, if applicable)
1.2 Applicant's Contact (Optional information; the Certificate will be dispatched to this person)	Name: Contact Email: ContactEMail

2. Type of Certificate/Approval		
2.1 EASA Approval of Change to Type Certificate	☐ Minor Change to TC	
2.2 Revision or Change to existing EASA Approval.	☐ Revision to Minor Change (leading to revised approval)	
	EASA Approval Number: EASA Approval Number	
2.3 F&C Classification (Commission Regulation (EU) No 319/2014)	☐ Simple	
	project has been rejected ☐	
	Justification	

3. Applicable F&C Product Category	F&C Product Category
Note: Data will be automatically filled in from the EASA Product list. Contact "products.master@easa.europa.eu" if you disagree with the F&C Category classification.	

4. Certificate Information		
4.1 Approval Holder (name, full address as to be printed on Certificate)	Approval Holder Street ZIP City Country	
4.2 Applicability	Type Certificate Number	Use EASA TC/TCDS when available
	Type Certificate Holder	
	Type Name	
	Model(s)	
	Manufacturer's Serial Number (s)	
	Engine model fitted to the referenced aircraft	
	Specify engine modifications, if applicable, relevant to the noise levels	

4.3 Title/ Description (Include description if needed to make the definition of the design change clear)	***AFM revision for administrative mass reduction from MTOM** XX, **MLM** XX (WV XX if applicable) **to MTOM** ZZ, **MLM** ZZ (WV ZZ if applicable).*	
4.4 EASA Certification Basis ***Note**: no need to recall the Certification Basis when the first box is ticked*	☐ I declare that the Certification Basis (CB) for the original product remains applicable to this certificate/ approval ☐ The proposed AFM-supplement is compliant with the following applicable requirements *List CS/JAR XX paragraphs + amdt*	
4.5 Product Characteristics	☐ Identify the aeroplane configuration to which this change applies: : ☐ Weight: *Identify the corresponding associated weight value, that needs to be covered by the original TCH AFM* ☐ I declare that the CG envelope declared in the original TCH AFM remains applicable ☐ Concerning the aeroplane configuration with no reference to a specific TCH aeroplane mass configuration: ☐ The reduced mass is less than 10 % below the MTOM XX/MLM XX*: Identify the value* ☐ The reduced mass is still above the zero-fuel mass declared in the TCDS *XXXYYYZZZ*: *Identify the value* ☐ The reduced MTOM/MLM is within the approved envelope recorded in TCDS *XXXYYYZZZ* and ☐ AFM *XXXYYYZZZ*	
4.5 Environmental Requirements ***Note**: Changes to the noise certification requirements and/or changes to the noise level(s) shall be recorded in the EASA TCDSN and/or the EASA noise database. Inform the Environmental Protection section to record the necessary changes.*	☐ Identify the record number from the EASA Noise database associated to the original MTOM/MLM aeroplane configuration valid at the moment of this application: *List the record number* ☐ I declare that for all the individual a/c belonging to the set of applicable MSN, the applicable individual noise certificates remain applicable, as the supplemental AFM has no impact on the noise database.	
4.6 Associated Technical Documentation	- *Original TCH AFM* *- Superseded AFM-Supplement* *- Proposed AFM-Supplement*	
4.7 Limitations/Conditions	☐	None
	☐	Other: if applicable, please define limitation/condition
	☐	The approval holder shall fulfil the obligations of Part 21, Point 21A.109. *(only applicable for minor changes)*

Appendix II