

**NOTICE OF PROPOSED AMENDMENT (NPA) No 22/2005**

**DRAFT DECISION OF THE EXECUTIVE DIRECTOR OF THE AGENCY**

**AMENDING**

**DECISION NO. 2003/19/RM OF THE EXECUTIVE DIRECTOR OF THE  
AGENCY**

**of 28 November 2003**

**on acceptable means of compliance and guidance material to Commission  
Regulation (EC) No 2042/2003 on the continuing airworthiness of aircraft and  
aeronautical products, parts and appliances, and on the approval of organisations  
and personnel involved in these tasks**

***“FUEL TANK SAFETY: incorporation of the Critical Design Configuration  
Limitations (CDCCL) into Acceptable Means of Compliance for Part-M, Part-145 and  
Part-66”***

TABLE OF CONTENTS

|   |     |                               | Page |
|---|-----|-------------------------------|------|
| A |     | EXPLANATORY NOTE              | 3    |
|   | I   | General                       | 3    |
|   | II  | Consultation                  | 4    |
|   | III | Comment Response Document     | 4    |
|   | IV  | Content of the draft decision | 4    |
|   | V   | Regulatory Impact Assessment  | 7    |
|   |     |                               |      |
| B |     | DRAFT DECISIONS               | 9    |
|   | I   | Draft Decision AMC Part-M     | 9    |
|   | II  | Draft Decision AMC Part-145   | 13   |
|   | III | Draft Decision AMC Part-66    | 16   |
|   |     |                               |      |

## **A. Explanatory Note**

### **I. General**

1. The purpose of this Notice of Proposed Amendment (NPA) is to put forward an amendment to Annex I, II and IV of the Acceptable Means of Compliance (AMC) to Part-M/-145/-66 to Decision 2003/19/RM of the Executive Director of 28 November 2003.<sup>1</sup> The reasons for this rulemaking activity are outlined further below.
2. The Agency is directly involved in the rule-shaping process. It assists the Commission in its executive tasks by preparing draft regulations, and amendments thereof, for the implementation of the Basic Regulation,<sup>2</sup> which are adopted as “Opinions” (Article 14.1). It also adopts Certification Specifications, including Airworthiness Codes and Acceptable Means of Compliance and Guidance Material to be used in the certification process (Article 14.2).
3. When developing rules, the Agency is bound to following a structured process as required by article 43.1 of the Basic Regulation. Such process has been adopted by the Agency’s Management Board and is referred to as “The Rulemaking Procedure”<sup>3</sup>.
4. This rulemaking activity is included in the Agency’s rulemaking programme for 2005. It implements the rulemaking task MDM.022 Fuel tank safety issues – AMC/GM.
5. The text of this NPA has been developed by the Agency. It is submitted for consultation of all interested parties in accordance with Article 43 of the Basic Regulation and Articles 5(3) and 6 of the EASA rulemaking procedure.

---

<sup>1</sup> Decision No 2003/19/RM of the Executive Director of the Agency of 28.11.2003 on acceptable means of compliance and guidance material to Commission Regulation (EC) No 2042/2003 of 20 November 2003 on the continuing airworthiness of aircraft and aeronautical products, parts and appliances, and on the approval of organisations and personnel involved in these tasks.

<sup>2</sup> Regulation (EC) No 1592/2002 of the European Parliament and of the Council of 15 July 2002 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency. OJ L 240, 7.9.2002, p. 1.

<sup>3</sup> 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/7/03, 27.6.2003.

## II. Consultation

6. To achieve optimal consultation, the Agency is publishing the draft decision of the Executive Director on its internet site. Comments should be provided within 3 months in accordance with Article 6(4) of the EASA rulemaking procedure. Comments on this proposal may be forwarded (*preferably by e-mail*), using the attached comment form, to:

**By e-mail:** [NPA@easa.eu.int](mailto:NPA@easa.eu.int)

**By Fax:** +49(221) 89990 5508

**By correspondence:** Process Support Unit  
Rulemaking Directorate  
EASA  
Ref: NPA 22-2005  
Postfach 10 12 53  
D-50452 Köln  
Germany

Comments should be received by the Agency before 20<sup>th</sup> March 2006. If received after this deadline they might not be treated. Comments may not be considered if the form provided for this purpose is not used.

## III. Comment response document

7. All comments received in time will be responded to and incorporated in a comment response document (CRD). This may contain a list of all persons and/or organisations that have provided comments. The CRD will be widely available on the Agency's website.

## IV. Content of the draft decision

8. In recent years the aviation industry has experienced a number of incidents or accidents involving fuel tank explosions. These events suggest that on some aircraft types, the fuel tank system installation does not provide as high a level of protection against explosion as had been expected.
9. The US Federal Aviation Administration (FAA) has issued a set of new rules related to fuel tank safety including SFAR 88 and appropriate amendments to parts of 14 CFR that require fuel tank system design reviews, associated modification reviews and improved maintenance procedures and practices.

10. The Joint Aviation Authorities (JAA) issued a letter dated 3 February 2003 which requested all the JAA National Aviation Authorities (NAA) to require their respective TC/STC Holders to carry out a safety review to meet JAA interim policy on Fuel Tank Safety (INT/POL/25/12). This policy had been harmonised with the policies of FAA, Transport Canada and Centro Técnico Aeroespacial (CTA) Brazil. The JAA NAA's were requested to mandate this policy requiring holders of Type Certificates and Major Modification approvals directly related to the fuel tank system installation, to undertake safety reviews based upon additional failure criteria. Where identified as necessary by such safety reviews, the introduction of corrective actions such as modifications, configuration critical items, improved maintenance practices and training had to be introduced.
11. The purpose of the then introduced JAA Temporary Guidance Leaflet (TGL) No. 47 of 1 July 2003 was to notify Certificate holders, Operators and their Maintenance Organisations of the current policy and associated actions necessary to implement the product of the above safety reviews. The Appendices of this TGL had also been harmonised with the FAA memorandum ANM112-05-011, "Policy Statement on Process for Developing SFAR No. 88 – related Instructions for Maintenance and Inspection of Fuel Tank Systems, from 6 October 2004.
12. The JAA interim policy highlights the need for a safety review based on JAR 25.1309 practices, taking into consideration in-service experience. The reviews were expected to be carried out by the holders of Type Certificate (TC) Holder or Supplemental Type Certificate (STC) related to aeroplanes with a passenger capacity of 30 seats or more, or a payload of 3402 kg or more. Where such reviews have identified unsafe conditions, action to correct these had to be mandated using available executive means.
13. Where the safety review had not identified an unsafe condition but a non-compliance with JAA interim policy, then the certificate holder had to establish appropriate revisions to relevant instructions for continued airworthiness, including maintenance requirements and improved maintenance practices required to maintain a satisfactory level of safety.
14. The Agency is now endeavouring to transfer this policy into the EASA regulatory framework. The work has been carried out in two phases. Firstly, JAR-OPS Subpart M has been amended to take into account changes in the type certificate holder data in the maintenance programme and the Agency has transferred this requirement into Part-M through NPA 05/2004 Ageing Aircraft Structures. The opinion of the Agency has been submitted to the Commission.<sup>4</sup> This NPA is now the second phase. It aims at transferring the content of JAA TGL No. 47 into the European regulatory framework.
15. By letter D 2005/CPRO/RH/50195, dated 05 August 2005, the Agency has also requested holders of TC and STC related to the large aeroplanes mentioned in

---

<sup>4</sup> Opinion No. 04/2005.

paragraph 12, to develop the instructions for maintenance and inspection of the fuel tank system ignition source prevention. This letter and its attachment are available on the EASA website. The letter was the result of a workshop organised by the Agency on 24 June 2005. The presentations made at the workshop and the summary of question and answers are also available on the EASA website.

16. An important concept of this policy is the introduction of Critical Design Control Configuration Limitations (CDCCL). As applied to fuel tank safety policy, this term refers to a feature of the fuel system design. The integrity must be maintained to ensure that unsafe conditions do not develop. Features in an aircraft installation or component that must be retained during modification, change, repair, or scheduled maintenance characterise CDCCL. These features may exist in the fuel system and its related installation or in systems that could, if a failure condition were to happen, interact with the fuel system in such a way that an unsafe condition would develop in the fuel system.
17. The definition of CDCCL does not include all the features inherent in a design; it includes only information necessary to ensure safety of fuel tank systems. The consideration underlying this definition is that holders of type certificates and supplemental type certificates should develop this information and make it available to the operators of affected airplanes. This is consistent with the information required for airworthiness limitations required by CS 25.571 Damage-tolerance and fatigue evaluation of structure.
18. CDCCL should be identified in the airworthiness limitation section of the Instructions for Continuing Airworthiness as an Airworthiness Limitation Item (ALI). However, CDCCL are not inspections or life-limited items, as are most existing ALIs. CDCCL are features usually controlled by operators (or, where necessary, holders of type certificates or supplemental type certificates) through the development of appropriate procedures.
19. As applied to fuel tank systems, ALI means fuel system mandatory instructions that can include design changes, maintenance, inspections, or procedures considered necessary to ensure that unsafe conditions do not arise in the fuel system throughout the operational life of the airplane. For each item identified as an ALI, the holder of a type certificate or a supplemental type certificate needs to develop instructions for design change, inspection and maintenance or procedural change. The ALI will be mandated by an airworthiness directive (AD) requiring incorporation of the necessary measures into the airworthiness limitations section of the Instructions for Continued Airworthiness.
20. Within this control it is the aim of this NPA to introduce applicable AMC/GM material. This was seen as a first step in view of the urgency of the subject pending possible amendments to the applicable Regulation (Commission Regulation 2042/2003). But the review of such Regulation has shown the following:
  - Maintenance programmes:

Paragraph M.A.302 (c) requires maintenance programmes to be based on data produced by TC holders, STC holders or organisations required to be approved in accordance with Part-21. Anything else requires the approval by the competent authority. In the case of ALIs it is EASA. Therefore, the introduction of CDCCL does not require a change of the Regulation.

– Maintenance Data:

Paragraph 145.A.45 requires aircraft maintenance organisations to hold and use current maintenance data. The maintenance instructions can only be modified with the approval of the competent authority. The introduction of CDCCL does therefore not require a change of the Regulation.

– Maintenance Training:

Paragraphs 145.A.30(e) and M.A.706 require personnel to be competent and this competence to be evaluated in view of their tasks. This is part of the organisation's expositions that is approved by the competent authority according to 145.A.70 (b) and M.A.704 (b). The introduction of CDCCL does therefore not require a change of the Regulation.

– Control of aircraft configuration:

Paragraph M.A.301 requires operators to control the configuration of their aircraft and to have an embodiment policy for non mandatory modifications and for repairs. Furthermore, paragraph M.A.304 requires modifications and repairs to be accomplished in compliance with Part-21. The resulting maintenance data will then become maintenance data that needs approval to be changed. The introduction of CDCCL does therefore not require a change of the Regulation.

In sum, with the envisaged approach, the introduction of CDCCL does not require any changes to the applicable EASA Regulation at this time.

## V. Regulatory Impact Assessment

### 21. Intent of the NPA

The purpose of NPA XX/2005 is to introduce the concept of CDCCL into the AMC to Part-M, Part-145 and Part-66.

### 22. Options

3 options can be identified:

Do nothing: This is not a viable option as CDCCL play a key role in fuel tank safety.

Present NPA: It increases the awareness of the aviation community relative to CDCCL and clarifies the actions to be taken by operators, maintenance organisations and maintenance personnel.

Modify Part-M, Part-145 and Part-66: As described in paragraph 20, this is not considered necessary.

The Agency has selected the option presented in this NPA.

23. Sectors affected

The sectors affected by this activity are operators of large aeroplanes, maintenance organisations dealing with large aeroplanes with a passenger capacity of 30 seats or more, or a payload of 3402 kg or more.

24. Impacts

Safety: CDCCL are a key element of fuel tank safety. Increasing awareness and clarifying the tasks to be performed by operators and maintenance organisation will improve safety.

Economic: The number of CDDCL is relatively limited so the impact on operators and maintenance organisations should be limited.

Environmental: No impact expected

Social: No impact expected

Other aviation requirements outside EASA scope: No impact expected

Foreign comparable regulatory requirements: EASA has maintained a close coordination with FAA, Transport Canada and Brazil CAA on the issue of fuel tank safety. The measures included in this NPA are harmonised with these Authorities.

25. Conclusion of the Regulatory impact assessment

Based on this RIA, the Agency considers that the progress of the proposal is justified.

## **B. Draft Decision**

The text of the amendment is arranged to show deleted text, new text or new paragraph as shown below:

1. ~~Text to be deleted is shown with a line through it.~~
2. **New text to be inserted is highlighted with grey shading.**
3. New paragraph or parts are not highlighted with grey shading, but are accompanied by the following box text:

|   |
|---|
| Insert new paragraph / part ( <i>Include N° and title</i> ), ore replace existing paragraph/ part |
|---|

4. ....  
Indicates that remaining text is unchanged in front of or following the reflected amendment.  
....

## **I. Draft Decision AMC Part-M**

### **AMC M.A.201 (h) Responsibilities**

- ....
4. An operator should therefore have adequate knowledge of the design status (type specification, customer options, airworthiness directives (AD), **Critical Design Configuration Control Limitations (CDCCL)**, modifications, operational equipment) and required and performed maintenance. Status of aircraft design and maintenance should be adequately documented to support the performance of the quality system.
- ....

### **AMC M.A.301 -5- Continuing Airworthiness Tasks**

....

Any other continued airworthiness requirement made mandatory by the Agency includes TC related requirements such as: certification maintenance requirements (CMR), certification life limited parts, airworthiness limitations, **Airworthiness Limitation Items (ALI)**, **Critical Design Configuration Control Limitations (CDCCL)**, etc.

### **AMC M.A.501(b) Installation**

- ....
3. The person referred to under M.A.801 or the M.A. Subpart F approved maintenance organisation should be satisfied that the component in question meets the approved data/standard, such as the required design and modification standards. This may be accomplished by reference to the TC holder or manufacturer's parts catalogue or other approved data (i.e. SB). Care should also be exercised in ensuring compliance with

applicable AD and the status of any service life limited parts fitted to the aircraft component as well as Critical Design Configuration Control Limitations.

**AMC M.A.501(d) Installation**

....

Insert new paragraph 7.

7. When using raw or consumable material on an aircraft or component Critical Design Control Limitations should be taken into account.

**AMC M.A.704 Continuing airworthiness management exposition**

....

10. Whenever the accountable manager is changed it is important to ensure that the new accountable manager signs the paragraph 9 statement at the earliest opportunity as part of the acceptance by the approving competent authority.  
Failure to carry out this action invalidates the M.A. Subpart G continuing airworthiness management approval or the air operators certificate.

11. The exposition should contain information, as applicable, on how the maintenance organisation ensures that no modification, repair or maintenance has an adverse effect on a feature identified as a Critical Design Configuration Control Limitation; this requires the development of appropriate procedures where necessary by the operator or contracted maintenance organisation. The exposition should state how the completion of Critical Design Configuration Control Limitations is traced.

Appendix V contains an example of an exposition lay-out.

Insert new paragraph AMC M.A.706(f)

**AMC M.A.706(f) Personnel requirements**

Additional training in fuel tank safety as well as associated inspection standards and maintenance procedures should be required of continuing airworthiness management organisations' technical staff, especially those technical support staff involved with the management of CDCCL, SB assessment, work planning and maintenance programme management.

Insert new paragraph AMC M.A.708(b)3.

**AMC M.A.708(b)3. Continuing Airworthiness Management**

When managing the design of modifications or repairs the organisation should ensure that Critical Design Configuration Control Limitations are taken into account by communicating all the relevant information on the configuration of the aircraft.

**Appendix I to AMC M.A.302 and AMC M.B.301(b)**

....

Insert new paragraph 1.1.14.

1.1.14. If applicable details of Critical Design Control Limitations together with appropriate procedures.

1.1.1514 ....

1.1.1615 ....

1.1.1716 ....

1.1.1817 ....

1.1.1918 ....

1.1.2019 ....

....

Insert new paragraph 2.4

**2.4 Critical Design Configuration Control Limitations (CDCCL)**

2.4.1 If CDCCL have been identified for the aircraft type by the TC/STC holder, maintenance instructions should be developed. CDCCL are characterised by features in an aircraft installation or component that should be retained during modification, change, repair, or scheduled maintenance.

2.4.2 The required safety review of the ignition prevention features of the fuel tank system may identify maintenance requirements which are new - in the sense that they were not specifically identified in the original maintenance analysis of that airplane. New maintenance requirements could include systems with second order failure conditions, which do not necessarily need immediate corrective action but which are needed to maintain continued airworthiness. For example, fuel system bonding can be identified as a subsystem and, as such, could be a Maintenance Significant Item (MSI). Any new maintenance requirements should be included in the maintenance development process to ensure full maintenance needs are treated in accordance with the established processes (e.g. MSG) as necessary.

The maintenance instructions identified during the safety review should be based on the application of engineering judgment and in-service experience (e.g. fuel tank cleaning procedures, clamping of wiring, or transferring fuel). It should be understood that no effective maintenance instruction could be developed to reduce the likelihood of possible accumulation of combustible fluids in areas adjacent to fuel tank walls, hence those areas are classified as “flammable leakage zones”.

Standard processes for the development of maintenance programs should be applied to the list of MSIs to generate new or revised maintenance instructions for fuel system ICAs, if required. The functional failures of the ignition prevention features should be taken into consideration for each MSI when establishing maintenance instructions.

A strong emphasis for maintenance development should be the consideration of hidden functional (latent) failure safety effects, especially for those applicants not using MSG analysis. Hidden functional failure safety effects are those failures where the loss of one hidden function (whose failure is unknown to the operating crew) does not affect safety but which, combined with an additional functional failure, has an adverse effect on operational safety.

The maintenance task descriptions and interval requirements produced by this analysis may result in changes to maintenance instructions and standard practices documents developed by the holders of type certificates and supplemental type certificates. These changes should be published through revision to documents, such as the following:

- Aircraft Maintenance Manual
- Component Maintenance Manual
- Maintenance Planning Document
- Maintenance Review Board Report Document
- Job/Work/Task cards.

To minimise any potential for confusion regarding other changes in these documents for other systems than the fuel tank system, these documents should qualify those changes applicable to the fuel tank system or segregate the results of the fuel tank system maintenance evaluation described in this guidance. These changes should then be incorporated into the operator's maintenance programme.

....

## II. Draft Decision AMC Part-145

### AMC 145.A.30(e) Personnel requirements

Insert new paragraph 11.

11. Additional training in fuel tank safety as well as associated inspection standards and maintenance procedures should be required of continuing airworthiness management organisations' technical staff, especially those technical support staff involved with the management of CDCCL, SB assessment, work planning and maintenance programme management.

### AMC 145.A.42(b) Acceptance of components

The EASA Form 1 identifies the eligibility and status of an aircraft component. Block 13 "Remarks" on the EASA Form One in some cases contains vital airworthiness related information which may need appropriate and necessary actions.

The receiving organisation should be satisfied that the component in question is in satisfactory condition and has been appropriately released to service. In addition, the organisation should ensure that the component meets the approved data/standard, such as the required design and modification standard. This may be accomplished by reference to the manufacturer's parts catalogue or other approved data (i.e. Service Bulletin). Care should also be exercised in ensuring compliance with applicable airworthiness directives, ~~and~~ the status of any life limited parts fitted to the aircraft component as well as Critical Design Configuration Control Limitations.

### AMC 145.A.45(b) Maintenance data

1. Except as specified in sub-paragraph 5, each maintenance organisation approved under Part-145 should hold and use the following minimum maintenance data relevant to the organisation's approval class rating. All maintenance related Implementing Rules and associated AMCs, approval specifications and Guidance Material, all applicable national maintenance requirements and notices which have not been superseded by an Agency requirement, procedure or directive and all applicable EASA airworthiness directives plus any non-national airworthiness directive supplied by a contracted non-EU operator or customer as well as Critical Design Configuration Control Limitations.

....

**AMC 145.A.45(d) Maintenance data**

The referenced procedure should address the need for a practical demonstration by the mechanic to the quality personnel of the proposed modified maintenance instruction. When satisfied the quality personnel should approve the modified maintenance instruction and ensure that the type certificate or supplementary type certificate holder is informed of the modified maintenance instruction. The procedure should include a paper/electronic trace ability of the complete process from start to finish and ensure that the relevant maintenance instruction clearly identifies the modification. Modified maintenance instructions should only be used in the following circumstances;

- a Where the type certificate / supplementary type certificate holders original intent can be carried out in a more practical or more efficient manner.
- b Where the type certificate / supplementary type certificate holders original intent cannot be achieved by following the maintenance instructions. For example, where a component cannot be replaced following the original maintenance instructions.
- c For the use of alternative tools / equipment.

Important note: Critical Design Configuration Control Limitations (CDCCL) are airworthiness limitations. Any modification of the maintenance instructions linked to CDCCL constitutes an aircraft modification that should be approved in accordance with Part-21.

**AMC 145.A.45(g) Maintenance data**

1. To keep data up to date a procedure should be set up to monitor the amendment status of all data and maintain a check that all amendments are being received by being a subscriber to any document amendment scheme. Special attention should be given to TC related data such as certification life limited parts, airworthiness limitations and Airworthiness Limitation Items (ALI), etc.
2. ....

**AMC 145.A.50(a) Certification of maintenance**

Insert new paragraph 3.

3. Critical Design Configuration Control Limitations should be traced during maintenance before a certificate of release to service is issued.

**AMC 145.A.65(b)(3) Safety and quality policy, maintenance procedures and quality system**

Insert new paragraph 4.

4. The maintenance organisation should ensure that no modification, repair or maintenance has an adverse effect on a feature identified as a Critical Design Configuration Control Limitation; this will require the development of appropriate

procedures where necessary by the maintenance organisation. The maintenance organisation should pay particular attention to possible adverse effects of any wiring change to the airplane, even a change not specifically associated with the fuel tank system. For example, it should be common practice to identify segregation of fuel gauging system wiring as a Critical Design Configuration Control Limitation.

Maintenance organisations can prevent adverse effects associated with wiring changes by standardising maintenance practices through training, rather than by periodic inspection. Training should be provided to end indiscriminate routing and splicing of wire and to provide comprehensive knowledge of critical design features of fuel tank systems that would be controlled by a Critical Design Configuration Control Limitation.

The maintenance of ignition prevention features is necessary for the inherent safety and reliability of an airplane's fuel tank system. The airplane cannot be operated indefinitely with the failure of an ignition prevention feature. The failure will have a direct adverse effect on operational safety. It could prevent the continued safe flight and landing of the airplane or cause serious or fatal injury to the occupants. The fuel system review required will identify ignition prevention features of the design. The failure of any of these features may not immediately result in an unsafe condition, but it may warrant certain maintenance to support continued airworthiness.

#### **AMC 145.A.70(a) Maintenance organisation exposition**

The following information should be included in the maintenance organisation exposition:

The information specified in 145.A.70 sub - paragraphs (6) and (12) to (16) inclusive, whilst a part of the maintenance organisation exposition, may be kept as separate documents or on separate electronic data files subject to the management part of said exposition containing a clear cross reference to such documents or electronic data files.

The exposition should contain the information, as applicable, specified in this AMC. The information, may be presented in any subject order so long as all applicable subjects are covered. Where an organisation uses a different format, for example, to allow the exposition to serve for more than one approval, then the exposition should contain a cross reference Annex using this list as an index with an explanation as to where in the exposition the subject matter can be found.

The exposition should contain information, as applicable, on how the maintenance organisation ensures that no modification, repair or maintenance has an adverse effect on a feature identified as a Critical Design Configuration Control Limitation; this requires the development of appropriate procedures where necessary by the operator or contracted maintenance organisation. The exposition should state how the completion of Critical Design Configuration Control Limitations is traced.

...

### III. Draft Decision AMC Part-66

Insert new paragraph AMC 66.A.45

#### **AMC 66.A.45 Type/task training and ratings**

Theoretical and practical training should take into account critical aspects such as Critical Design Configuration Control Limitations.