

REVIEW AND APPROVAL OF CERTIFICATION BASIS AND CERTIFICATION PLAN JOB FUNCTION 1

1. PURPOSE

This job function describes the process for aviation safety inspectors (hereinafter referred to as ASI) who are in charge of evaluating both the certification basis (herein after referred to as C.B.) and the certification plan that are submitted by the applicant of certification.

2. GENERAL

This job function is defined for sake of ensuring that the certification basis (including the applicable airworthiness regulations/standards/requirements, the special conditions, etc) of the product under application has put all the necessary airworthiness and safety concerns under consideration. Besides, this job function also provides the guideline for ascertaining that the expected outcome of the relevant certification plan will be capable of showing compliance status of the product to the certification basis and contains all the necessary information. In addition, this job function also assists the aviation inspector to evaluate the feasibility of proposed certification schedule and the milestones provided therein.

3. REFERENCES

- A. FAA ORDER 8110.4C *"Type Certification"*
- B. FAA AC21-40A *"Guide for Obtaining a Supplemental Type Certificate"*
- C. FAA Airframe Engineering Job Function Training Handbook, Module 1: *Establishing a Certification Basis and Seeking Policy Guidance*
- D. FAA Airframe Engineering Job Function Training Handbook, Module 9: *Planning a Type Certification Project*
- E. FAA ACS System Engineer Job Aid *"Tasks and Procedures for Design Approvals and Technical Project Management"*

4. PREREQUISITE AND COORDINATION

A. PREREQUISITE

The ASI who conducts the said review and approval should familiarize with, but not limit to, the relevant civil aviation regulations/requirements, the relevant ICAO regulations/requirements, and the airworthiness standards that are adopted or established by CAA. The ASI should also have a grasp on the reference material that deemed necessary for perform his/her work. The reference material includes, but not limit to, FAA ORDERS/AC, EASA AMC.

B. COORDINATION

When performing his/her job, the ASI shall cooperate with each other and seeks coordination from the CPM as necessary.

5. INITIATION AND PLANNING

A. INITIATION

- (1) This task is initiated when the applicant inform CAA of his/her intent for certification application.

B. PLANNING

- (1) For sake of ensuring comprehensive deliberation and feasibility of the certification program, the ASI should keep close communication with applicant, as to get grasp of his/her capability regarding design and certification, to familiarize the design characteristics of the product, and consequently, to identify the applicable airworthiness regulations/standards/requirements.
- (2) This task is categorized as part of activity in the so-called pre-application or the formal application stage.

6. PROCEDURE

A. REVIEW AND APPROVAL OF CERTIFICATION BASIS

The prerequisite before the applicant embarking on conceiving and therefore proposing a certification plan is that the certification basis has been settled. As the consequence, the applicant should submit his/her proposed C.B. to CAA for approval in the very beginning of each certification program, whereas the CAA personnel should communicate with the applicant to have thorough comprehension on the design and subsequently determine if the provided proposal is acceptable. Amendments to the proposed C.B. may be carried out as circumstance required. The final C.B. is composed of the following:

- (1) The applicable civil aviation regulations/standards/requirements
The ASI shall ensure that the applicant has deliberated in detail the design characteristics of product under application and, as the consequence; all the applicable regulations and standards are clearly and completely specified (including the applicable amendments and items).
- (2) Special Condition (hereinafter referred to as S.C.)
If the CAA finds that the existing airworthiness regulations/ standards/ requirements do not contain adequate or appropriate safety requirements for the article under application because of a novel or unusual design feature thereof, the CAA will prescribe, in accordance with the relevant regulations, the supplemental requirement(s) through the issuance of special conditions.

The ASI shall ensure that the special conditions, if required, will adequately address all the safety concerns. The issued S.C. should establish at least a level of safety equivalent to that established in the existing safety and environmental regulations/standards/requirements.

(3) Exemptions

The applicant may petition the CAA for a temporary or permanent exemption from a CAA defined regulation/standard/requirement that may not applicable to the product under certification.

The ASI shall review previous approved exemption records enclosed in the certification projects, both domestic and overseas, of similar configuration, to ensure that the request of exemptions, if granted, will bring no impact to public interest and safety. The grant of exemption should be undergone through the relevant administrative process.

(4) Equivalent Level of Safety Findings

Equivalent level of safety findings are made when literal compliance with a certification regulation/standard/requirement cannot be shown and consequently, the applicant proposes some compensating means, that is acceptable to the CAA, to provide an equivalent level of safety.

The ASI shall ensure that the proposed alternative means of compliance regarding the equivalent safety item, if granted, will lead to at least the same safety level to the original requirement.

B. REVIEW AND APPROVAL OF CERTIFICATION PLAN

The applicant should submit CAA for approval the proposed means of compliance (MOC) for each item enclosed in the C.B. The applicant shall submit CAA these information through a devisal of certification plan. Well-developed certification plan will serve as the basis for co-work and interaction during the certification process, increase the mutual understanding both sides, preclude the misinterpretation the extent as possible, and thus facilitate the pace of certification. The certification plan may include, but not limit to, the following:

(1) Introduction

(2) Description of Design Characteristics

(3) Certification Requirements

(a) The detailed items of regulations/standards/requirements as enclosed in the final C.B.

(b) Compliance Checklist

(4) Means of Compliance: the acceptable methodology for showing compliance; which can be:

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- (a) Analysis (e.g. stress/structure/ load analysis, safety analysis, safety analysis, fatigue analysis, and performance analysis, etc)
 - (b) Test (e.g. flammability test, static/dynamic test, pressure test, simulation test, laboratory test, ground test, installation test, flight test, etc)
 - (c) Design Review.
 - (d) Other means acceptable to the CAA.
- (5) Hazard Assessment Summary; which may be:
- (a) System criticality analysis, to evaluate the effect to flight safety.
 - (b) Software criticality analysis, if the product contains some software program, to evaluate the effect to flight safety.
 - (c) Functional Failure Conditions Summary
- (6) Operational Considerations
Summary of proposed amendments to the MMEL, FCOM, AFM, if deemed necessary.
- (7) Certification Documentation
A list of certification documents that will be provided during and by the end of the certification process.
- (8) Certification Schedule; which contains at least the following:
- (a) Proposed timeframe and milestones for certification.
 - (b) Proposed date for design data submittal.
 - (c) Proposed date for certification report submittal.
 - (d) Proposed date for certification test.
 - (e) Proposed date for conformity inspection.
 - (f) Proposed date for certificate issuance.
- (9) Other information deemed beneficial to the certification activity afterward.

The certification team should evaluate the provided certification plan. The potential concerns for such evaluation may be:

- (1) Whether the certification plan has enclosed completely the pre-defined certification basis.
- (2) Whether the proposed compliance checklist is sufficient for defining the task necessary in subsequent certification activity.
- (3) Whether the prescribed tasks enclosed in will yield adequate and appropriate information for showing compliance with the C.B.
- (4) Whether the proposed means of compliance (MOC) is adequate and acceptable.
- (5) Whether the proposed timetable is reasonable and feasible.
- (6) Whether the manpower within the CAA is both available and sufficient to cope with the proposed time schedule.

- (7) Whether the entire probable impact to continuous airworthiness and operation is adequately addressed.
- (8) Whether the applicant is capable of conducting the proposed certification activity.
- (9) Whether the scope and items of certification documents are well specified for providing sufficient information of about further certification activity.
- (10) Whether the provided methodology for certification document and schedule control is capable of ensuring the consistency and effectiveness of certification program afterwards.
- (11) Other items deemed necessary.

When the above-mentioned evaluation is accomplished, the ASI should communicate with the applicant for locating the mutual acceptable certification plan.

For sake of expediting the certification process, the ASI should request the applicant to conceive a compliance checklist. The compliance checklist may contain, with the format defined by the applicant, the full or part of following information as necessary:

- (1) The regulatory designation and the detailed content of each item as enclosed in the final C.B.
- (2) Succinct elucidation of the means of compliance for each required item.
- (3) The essential information such as titles, designation, and version of the certification report that will be created afterwards for each item.
- (4) The division in charge and the channel of correspondence.
- (5) Remarks and/or description.

Unless significant safety concern emerges afterwards, the C.B. should remain unchanged once an agreement is reached between both sides. Whereas the certification plan can be revised from time to time to reflect the practical need and the pace of each certification program.

7. AVAILABLE REFERENCE

When reviewing the C.B. and certification plan, some usual reference material is cited as follows:

- A. FAA Orders/ACs/NPRM
- B. JAA/EASA AMC
- C. MIL-Standards/Spec/Handbook
- D. ASTM materials
- E. SAE Aerospace Standards
- F. RTCA DO-xxx Standards

G. ARINC Standards