

Schedule One

Definitions:

For the purposes of design delegation the following definitions apply:

1. A **major design change** means a change that is not a 'minor design change'.
2. A **minor design change** means a change that has no appreciable effect on the weight, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of the product.

Guidance Information:

The following information and examples are provided as guidance on what constitutes a major design change:

1. A design change is judged to have an "appreciable effect on other characteristics affecting the airworthiness of the product" and therefore should be classified major, in particular but not only, when one or more of the following conditions are met:
 - a. Where the change requires an adjustment of the type-certification basis (such as special condition, equivalent safety finding, elect to comply, exemption, reversion, later requirements).
 - b. Where a new interpretation of the requirements used for the type type-certification basis is proposed, that has not been published as advisory material or otherwise agreed with the CAA.
 - c. Where the demonstration of compliance uses methods that have not been previously accepted as appropriate for the nature of the design change to the product or for similar design changes to other products.
 - d. Where the extent of new substantiation data necessary to comply with the applicable airworthiness requirements and the degree to which the original substantiation data has to be re-assessed and re-evaluated is considerable.
 - e. The design change alters the Airworthiness Limitations or the Operating Limitations.
 - f. The change is made mandatory by an airworthiness directive or the change is the terminating action of an airworthiness directive. NOTE: Design changes previously classified minor and approved prior to the airworthiness directive issuance decision need no re-classification. However, the CAA retains the right to review the change and re-classify/re-approve if found necessary.
 - g. Where the change introduces or affects functions where the failure effect is classified as catastrophic or hazardous.

2. Examples of Major Design Changes per Discipline

For an understanding of how to apply the above conditions it is useful to take note of the examples given below. The information below is intended to provide a few major design change examples per discipline, resulting from application of the definition and the paragraph 1 conditions. It is not intended to present a comprehensive list of all major design changes. Examples are categorised per discipline and are applicable to all products (aircraft, engines and propellers). However a particular design change may involve more than one discipline, e.g., a design change to engine controls may be covered in engines and systems (software).

Those involved with classification should always be aware of the interaction between disciplines and the consequences this will have when assessing the effects of a design change (i.e., operations and structures, systems and structures, systems and systems, etc.; see example in paragraph 2.b.ii.

Specific rules may exist which override the guidance of these examples.

Please note that a negative definition is given of minor design changes only. However in the following list of examples it was preferred to give examples of major design changes. Where in this list of examples the words “has effect” or “affect(s)” are used, they are always to be understood as being the opposite of “no appreciable effect” as in the definition of minor design change. Strictly speaking the words “has appreciable effect” and “appreciably affect(s)” should have been used, but this has not been done to improve readability.

a. Structure

- i. design changes such as a cargo door cut-out, fuselage plugs, change of dihedral, addition of floats;
- ii. design changes to materials, processes or methods of manufacture of primary structural elements, such as spars, frames and critical parts;
- iii. design changes that adversely affect fatigue or damage tolerance or life limit characteristics;
- iv. design changes that adversely affect aeroelastic characteristics.

b. Cabin Safety

- i. changes which introduce a new cabin layout of sufficient change to require a reassessment of emergency evacuation capability or which adversely affect other aspects of passenger or crew safety. Items to consider include, but are not limited to:
 - design changes to or introduction of dynamically tested seats.
 - design change to the pitch between seat rows.
 - design change of distance between seat and adjacent obstacle like a divider.
 - design changes to cabin lay outs that affect evacuation path or access to exits.
 - installation of new galleys, toilets, wardrobes, etc.
 - installation of new type of electrically powered galley inserts.

- ii. design changes to the pressurisation control system which adversely affect previously approved limitations.

c. Flight

Design changes which adversely affect the approved performance, such as high altitude operation, brake changes that affect braking performance.

Design changes which adversely affect the flight envelope.

Design changes which adversely affect the handling qualities of the product including design changes to the flight controls function (gains adjustments, functional modification to software) or design changes to the flight protection or warning system.

d. Systems

For systems assessed under xx.1309, the classification process is based on the functional aspects of the design change and its potential effects on safety.

- i. Where failure effect is 'Catastrophic' or 'Hazardous', the design change should be classified as major.
- ii. Where failure effect is 'major', the design change should be classified as major if:
 - aspects of the compliance demonstration use means that have not been previously accepted for the nature of the design change to the system; or
 - the design change affects the pilot/system interface (displays, controls, approved procedures); or
 - the design change introduces new types of functions/systems such as GPS primary, TCAS, Predictive windshear, HUD.

The assessment of the criteria for software design changes to systems also needs to be performed. When software is involved, account should be taken also of the following guidelines:

Where a design change is made to software produced in accordance with the guidelines of EUROCAE ED12B/RTCA DO-178B "Software Considerations in Airborne Systems and Equipment Certification", the design change should be classified as major if either of the following apply, and the failure effect is Catastrophic, Hazardous or Major:

1. the executable code for software, determined to be Level A or Level B in accordance with the guidelines, is changed unless that change involves only a variation of a parameter value within a range already verified for the previous certification standard; or
2. the software is upgraded to or downgraded from Level A, Level B or Level C; or
3. the executable code, determined to be level C, is deeply changed, e.g., after a software reengineering process accompanying a change of processor.

For software developed to guidelines other than ED-12B/DO-178B, the design change should be assessed in accordance with the foregoing principles.

For other codes the principles noted above may be used. However, due consideration should be given to specific requirements/interpretations.

e. Propellers

Design changes to:

- i. diameter
- ii. airfoil
- iii. planform
- iv. material
- v. blade retention system, etc.

f. Engines

Design changes:

- i. that adversely affects operating speeds, temperatures, and other limitations.
- ii. that affects or introduces parts where the failure effect has been shown to be hazardous.
- iii. that affects or introduces engine critical parts or their life limits.
- iv. to a structural part which requires a re-substantiation of the fatigue and static load determination used during certification.
- v. to any part of the engine which adversely affects the existing containment capability of the structure.
- vi. that adversely affects the fuel, oil and air systems, which alter the method of operation, or require reinvestigation against the type-certification basis.
- vii. that introduces new materials or processes, particularly on critical components.

g. Rotors and drive systems

Design changes that:

- i. adversely affect fatigue evaluation unless the service life or inspection intervals are unchanged. This includes changes to materials, processes or methods of manufacture of parts, such as:
 - rotor blades
 - rotor hubs including dampers and controls
 - gears
 - drive shafts
 - couplings
- ii. affect systems the failure of which may have hazardous or catastrophic effects. The design assessment will include:
 - cooling system

- lubrication system
 - rotor controls
- iii. adversely affect the results of the rotor drive system endurance test.
 - iv. adversely affect the results of the shafting critical speed analysis.

h. Power plant Installation

Design changes which include:

- i. control system changes which affect the engine/propeller/airframe interface;
- ii. new instrumentation displaying operating limits;
- iii. modifications to the fuel system and tanks (number, size and configuration);
- iv. change of engine/propeller type.

