CIVIL AVIATION AUTHORITY OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa

Advisory Circular AC146-2

Revision 0

Delegations for the approval of design changes

XX XXXX 2026

General

Civil Aviation Authority (CAA) Advisory Circulars (ACs) contain information about standards, practices, and procedures that the Director has found to be an **acceptable means of compliance** with the associated rule.

Consideration will be given to other methods of compliance that are presented to the Director. When new standards, practices, or procedures are found to be acceptable they will be added to the appropriate AC.

Purpose

This AC provides guidance on the granting of a delegation for the approval of design changes in accordance with Section 462 of the Civil Aviation Act 2023 (CA Act).

Related Rules

This AC relates to Civil Aviation Rule Part 146, *Aircraft Design Organisations – Certification* and Part 21, *Certification of Products and Parts.*

Change Notice

Revision 0 is the initial issue of this AC. Some content was moved from Revision 2 of AC146-1 to this AC.

Version History

History Log

Revision No.	Effective Date	Summary of Changes
0	XX XXXX 2026	Initial issue

Table of Contents

Introduction

1. Part 21 prescribes the requirements for the approval of aircraft design changes and Part 146 governs the certification of Aircraft Design Organisations.

2. Section 462 of the CA Act allows the Director to delegate the approval of aircraft design changes (in accordance with Part 21.73(a)(2) and 21.505) to a person who is not a CAA employee. Part 146.11 allows the holder of a Design Organisation certificate to employ such a person to approve aircraft design changes.

3. This AC provides guidance that the Director has found to be an acceptable means of compliance with Appendix A of Part 146, namely the associated privileges and limitations and the qualifications and experience required for the grant of a delegation for the approval of design changes.

4. This AC should be read in conjunction with AC146-1.

Part 146 Appendix A.1 — Privileges and Limitations

A.1(b) – Design organisation association

5. The design delegation holder is not permitted to carry out their delegated approval function outside a design organisation. This ensures that the support structure is available for that person to satisfactorily approve design changes. Therefore, the design delegation holder relinquishes their delegation if they leave a design organisation.

6. It would be acceptable for a design delegation holder to move from one design organisation to another and retain their delegation. If the organisations had different ratings or design activities the delegation may require amendment to reflect the scope of the new organisation.

7. Regardless of whether any change in scope is involved, the delegation must be re-issued to refer to the new design organisation. Design delegation holders intending to move organisations should contact CAA as soon as possible to allow time for the re-issue, because delegation privileges at the new organisation cannot be exercised until the re-issue is completed.

A.1(d) – Class A/B Design Changes

8. Design changes are divided into two classes for the purpose of approval by delegation holders:

    - Class A design changes that require full engineering investigation, and
    - Class B design changes that do not require full engineering investigation.

9. These classes of design changes should not be confused with designation of major / minor modification or repair. Refer to Appendix D of AC146-1 for additional guidance.

10. The classes of design changes (Class A or B), which may be approved by a delegation holder, are included within each scope statement documented on an Instrument of Delegation. Refer to section 146 A1. (e) below for additional details.

A.1(e) – Scope of Design Approvals

11. This section details a range of terms and statements used to describe common conditions of an Instrument of Delegation issued for the approval of modifications and repairs.

12. The conditions stated on an Instrument of Delegation include the scope of design changes which may be approved by the delegation holder. Any breach of such conditions invalidates the exercise of the delegated functions and powers.

13. The terminology and statements included in this section indicate a range of conditions (scope statements) which may be sought by an applicant for a design delegation, subject to demonstration of competence in each area.

14. The final conditions of a delegation may differ from the statements contained in this AC. This section presents a range of scope statements, but not the only statements which may be included in an Instrument of Delegation.

15. An applicant for a design delegation may propose their own terminology to describe the scope of design changes for approval, however such statements must ensure the competency of the applicant can be readily assessed in all relevant areas of their proposed scope, and such statements can be clearly interpreted for all relevant purposes.

16. ***Note:*** *an applicant or holder of a Part 146 Design Organisation Certificate should also consider alignment between the scope of work to be undertaken by the organisation (as required by rule 146.67(a)(8)) and the scope of design changes which may be approved by delegation holders employed or engaged by the organisation. Refer to the section on rule 146.11 of AC146-1 for further guidance.*

Framework for Scope Statements

17. The scope of design changes which may be approved by a delegation holder are described by three criteria:

    - **Product Scope** – the size and type of products to which design changes can be made
    - **Engineering Scope** – the physical or functional aspects of a product to which design changes can be made.
    - **Conditions** – inclusion-based statements which describe the type or extent of design changes which can be approved.

18. The description of each Product Scope also specifies whether the delegation holder may approve Modification or Repairs (or both) for that type of product.

19. Engineering Scope statements are included within each Product Scope, and these statements also specify whether the delegation holder may approve a Class A or Class B design change in that area.

20. Condition statements are included within each Engineering Scope statement.

21. Any terms or statements which appear in this AC but do not appear in an Instrument of Delegation are **not within the scope of that delegation**.

22. ***Note:*** *all Instruments of Delegation include a standard condition that functions and powers shall not be exercised in respect of modifications that are classified as major design changes (which are defined in a "Schedule One" attachment to each delegation). The scope of design changes described in this AC do not affect the applicability or interpretation of that condition in any respect.*

Example Scope Statements

23. Table 1 includes common **Product Scope** terms which may be included on an Instrument of Delegation.

Table 1: Instrument of Delegation – example Product Scope terms

Product Scope	Description
Large Aeroplanes	An aeroplane (as defined in rule Part 1) with a certification basis of Title 14, Part 25 of the Code of Federal Regulations[1]
Small Aeroplanes	An aeroplane (as defined in rule Part 1) with a certification basis of Title 14, Part 23 of the Code of Federal Regulations[1]
Large Rotorcraft	A rotorcraft (as defined in rule Part 1) with a certification basis of Title 14, Part 29 of the Code of Federal Regulations[1]
Small Rotorcraft	A rotorcraft (as defined in rule Part 1) with a certification basis of Title 14, Part 27 of the Code of Federal Regulations[1]
Powerplants (piston engines)[2]	A reciprocating engine with a certification basis of Title 14, Part 33 of the Code of Federal Regulations[1]
Powerplants (gas turbine engines)[2]	A gas turbine engine with a certification basis of Title 14, Part 33 of the Code of Federal Regulations[1]
Powerplants (electric)[2]	A type of aircraft engine that converts electric power into mechanical power or thrust used for propulsion. Not including gearboxes, energy storage systems, thrusters, or electrical power generation systems.
Powerplants (hybrid-electric)[3]	A type of aircraft engine that generates electrical power for use as primary aircraft propulsive power.
Propellers (fixed pitch)[3]	A propeller (as defined in rule Part 1) with a certification basis of Title 14, Part 35 of the Code of Federal Regulations[1], whose blade pitch cannot be changed while

[1] Or a set of airworthiness design standards that the Director determines: comply with ICAO Annex 8 and provide an equivalent level of safety to the stated airworthiness design standard.

[2] Multiple Powerplant product categories may be added depending on DDH competency e.g. "Powerplants (piston and gas turbine engines)"

[3] Multiple Propeller product categories may be added depending on DDH competency e.g. "Propellers (fixed and variable pitch)"

	rotating. This product scope includes ground-adjustable propellers.
Propellers (variable pitch)[3]	A propeller (as defined in rule Part 1) with a certification basis of Title 14, Part 35 of the Code of Federal Regulations[1], which permits a change of blade pitch while the propeller is rotating. This product scope includes constant-speed propellers.
Large UAS	An unmanned aircraft system (as defined in rule Part 1) which incorporates an unmanned aircraft with a gross mass of more than 25 kg.
Small UAS	An unmanned aircraft system (as defined in rule Part 1) which incorporates an unmanned aircraft with a gross mass less than 25kg.
LSA	A light sport aircraft (as defined in rule Part 1).
Microlights	A microlight (as defined in rule Part 1) which meets low momentum parameters as defined in AC103-1.
Balloons	As defined in rule Part 1.

24. Table 2 includes common **Engineering Scope** statements which may be included under various Product Types.

Table 2: Instrument of Delegation – example Engineering Scope statements

Engineering Scope	Description
Structures	Design changes to components and structural elements which support loads. Including (but not limited to) the determination of loads, changes to design details, material specifications or processes that affect the strength or durability of parts.
Avionic Systems	Including (but not limited to) design changes that affect navigation, communication, flight data, flight management, engine control, flight control or autopilot systems, fuel systems, flight instruments, cybersecurity, HIRF/lightning protection, electromagnetic compatibility, system level integration or development.
Electrical Systems	Including (but not limited to) design changes that involve electrical power generation, electrical power distribution, power storage, electrical wiring interconnection systems, circuit protection, lighting systems, HIRF/lightning protection, electromagnetic compatibility.
Cabin Interiors	Including (but not limited to) design changes that affect crashworthiness, passenger compartment or flight deck interior arrangements, cargo and baggage compartments, emergency equipment, material flammability, occupant protection and emergency egress.
Rotors & Drive Systems	Including (but not limited to) design changes that affect rotor blades, rotor hubs, transmission systems, gears, drive shafts, couplings and associated systems.

Mechanical Systems	Including (but not limited to) design changes that affect flight control, environmental, hydraulic, oxygen, ice protection, water systems, fuel systems, wheels/tyres/brakes, hoist/lifting, role equipment, evacuation systems.
Flight	Design changes that may affect aircraft performance, flight characteristics, handling (including but not limited to aircraft controllability, manoeuvrability, stability) and flightcrew interface.
Acoustical	Design changes that affect compliance with aircraft noise standards (e.g. ICAO Annex 16 Volume I or equivalent).
Emissions	Design changes that affect compliance with aircraft emission standards (e.g. ICAO Annex 16 Volume II or equivalent).
Airborne Software and Electronic Hardware	Including (but not limited to) design changes that involve computer programmes (including associated data), electronic hardware items installed in airborne equipment/systems on a type-certificated product, development and/or development assurance at item level. Examples of electronic hardware items include (but are not limited to) LRUs, circuit board assemblies, custom micro-coded components such as Application Specific Integrated Circuits (ASICs) and Programmable Logic Devices (PLDs), including any associated macro functions, integrated technology components, such as hybrids and multi-chip modules, Commercial-Off-The-Shelf (COTS) components.

25. Table 3 includes **Engineering Scope** statements which may be included under a **Powerplant** Product Scope.

Table 3: Instrument of Delegation – example Powerplant Engineering Scope statements

Core engine	Design changes affecting core sections of an aircraft engine involved in converting chemical energy (oxygen and fuel sources) into thermal and mechanical energy (mass flow and shaft rotation). Reciprocating engines – core sections include the cylinder head, pistons, crank shaft, valves, cam shafts, and crank case. Gas turbine engines – core sections include the compressor, combustion and turbine stages.
Fuel metering systems	Design changes affecting components and systems involved in supplying the correct mixture of fuel and air to aircraft engines (including but not limited to; carburettors and fuel control units).
Lubrication systems	Design changes affecting components and systems involved in the distribution and cooling of lubricants used

	to reduce friction within an aircraft engine (including but not limited to; oil tanks, pumps, filters, oil cooling components).
Ignition systems	Design changes affecting components and systems involved in providing a high-energy spark for igniting the air/fuel mixture in the combustion chamber of an aircraft engine.
Exhaust & thrust reverser systems	Design changes affecting components and systems involved in discharging or diverting fan or exhaust gases from an aircraft engine (including but not limited to; exhaust collectors/manifolds, heat exchangers, exhaust cones, nozzles, thrust reverser systems).
Induction systems & engine cowls	Components and system that affect the condition and flow of air through, and immediately around, an aircraft engine (including but not limited to; inlet and fan ducts, nacelle panels, air filters, induction manifolds, throttle body, and superchargers).

26. Table 4 includes **Condition** statements which may be included under the relevant Engineering Scope statements (as noted).

Table 4: Instrument of Delegation – example Condition statements

Engineering Scope	Condition	Description
Structures	Including metallic primary and secondary structures	Primary structure is structure which carries flight, ground, or pressurisation loads, and whose failure would reduce the structural integrity of the airplane Secondary structures are those that are not primary load carrying members, and their failure would not reduce the structural integrity of the airframe or prevent the airplane from continuing safe flight and landing.
	Including composite primary and secondary structures	Design changes to structural elements constructed of fibre reinforced materials or those that involve structural bonding. Including (but not limited to) the analysis of composite structures using classical lamination theory.
	Including fatigue (safe life) and damage tolerance analysis	Design changes requiring analysis to confirm that structural elements will not degrade below their design

		ultimate value (safe life) or retain their required residual strength after sustaining damage (damage tolerance).
	Including aeroelastic considerations	Refer to Appendix A of this AC for a detailed description of "aeroelastic considerations".
	Including dynamic components	Refer to Appendix A of this AC for a detailed description of "dynamic components".
	Including additively manufactured components	Design changes involving components made from 3D model data, usually layer upon layer, as opposed to subtractive or formative manufacturing methods. Reference ISO/ASTM 52900.
Avionics Systems	Limited to integration and installation only	Design changes which do not involve the modification of discrete avionics components (required for compliance with airworthiness design standards). "Modification" includes any changes to the configuration required for the operation of such items (e.g. software versions or settings).
	Including design changes to avionic components	Design changes which incorporate modifications to the configuration of discrete required avionics components (required for compliance with airworthiness design standards). Examples of avionics components include (but are not limited to) instruments, radios, navigation receivers, antenna, sensors, PSUs, FMS/GPS modules, CPUs, electronic displays etc.
	Including design changes involving NVIS Including design changes to certify NVIS systems or design changes to previously certified NVIS systems	Design changes involving components and systems required to show compliance with acceptable airworthiness design standards for Night Vision Imaging Systems. Refer AC91-13.
	Including modifications to avionic systems that affect the	Design changes that involve components and systems required for IFR operations.

	IFR certification and/or capability of the aircraft	
Flight	Limited to showings of 'unaffected'	Limited to design changes where there is a negligible difference in aircraft performance, flight characteristics, handling, and flight crew interface compared to the baseline design.
	Including design changes that affect flight crew interface only.	Including design changes which affect flight crew procedures, crew workload, instrumentation, crew alerting, marking and placards, but where these is negligible difference in aircraft performance, flight characteristics and handling compared to the baseline design.
	Including design changes that affect aircraft performance and/or flight crew interface only.	Including design changes which affect aircraft performance and/or flight crew interface, but where there is negligible difference in the aircraft handling and flight characteristics compared to the baseline design.
	Including design changes that affect aircraft performance, flight characteristics, handling and/or flight crew interface (excluding flutter and systems structures interface, spinning, H/V envelope determination, and autorotation characteristics).	Including design changes which affect aircraft performance, flight characteristics, handling and/or flight crew interface, but excluding those which require a finding compliance with FAR 23.221, 23.629, 23.2510, 23.2245, 27.71, 27.87 (or equivalent airworthiness requirements)
	Including design changes that affect aircraft performance, flight characteristics, handling and flight crew interface (including flutter and systems structures interface, spinning, H/V envelope determination, and autorotation characteristics)4.	Including design changes which affect aircraft performance, flight characteristics, handling and/or flight crew interface, including those which require a finding compliance with FAR 23.221, 23.629, 23.2510, 23.2245, 27.71, 27.87 (or equivalent airworthiness requirements).

[4] Specific terms to be included based on DDH competency.

Airborne Software and Electronic Hardware	Limited to design changes involving software at Design Assurance Level C or D	Where the Design Assurance Level has been determined in accordance with acceptable design standards.
	Limited to item level finding of compliance	Applicable when the DDH scope is limited to AEH and SW

27. As noted above, the information in the AC is provided as guidance only. The final conditions of delegation may differ from the statements made in this AC. Each applicant for a design delegation (including those seeking an extension to the scope of their delegation) is required to demonstrate their understanding and experience across all areas of their proposed scope.

A.1(d) – Flight Manual Supplements

28. In conjunction with design change approvals, it is appropriate that a delegation holder can approve flight manual supplements. However, there is a limitation on this ability. The delegation holder may only approve those flight manual supplements that result directly from a design change the organisation develops and the delegation holder approves. Flight manual amendment alone should be referred to the Aircraft Certification Unit of the CAA.

29. Flight manual supplements are further described in Appendix A to the AC. Flight manuals, and their approval are detailed in AC21-5.

Part 146 Appendix A.2 — Qualifications

A.2(b)(2) – Competency Assessment

30. The interview for the delegation holder is considered a critical assessment of their understanding and experience with respect to designs and design changes. This interview will determine the scope and any limitations or restrictions that may be placed on the delegation.

A.2(b)(3) and (4) – Qualifications and Experience

31. The qualification requirements are clearly laid out. The applicant for a delegation will be expected to meet the academic qualifications as a minimum to be considered for a delegation interview.

Maintaining Competency

32. After the issue of the delegation, the holder would be expected to maintain some form of CPD. This is considered important to ensure that the delegation holder remains current with up-to-date technologies and the application of professional standards to their work. Delegation holders should examine the organisation's procedures and ensure that CPD is available and supported by the organisation.

Appendix A

This appendix provides a description and interpretation of the terms “aeroelastic considerations” and “dynamic components” (conditions associated with the Structures engineering scope), aligned with guidance material that is used and developed by the FAA.

Aeroelastic Considerations

The term "aeroelastic" is applied to an important class of phenomena which involves the mutual interaction between the inertial, aerodynamic, and elastic forces in a structure. These forces can interact to give rise to a variety of aeroelastic phenomena ranging from transient or dynamic responses as a result of external forces (vibration or buffeting) to aeroelastic instabilities (flutter or divergence).

1. **Vibration** An oscillation of the structure or of a control surface resulting from an independent external excitation.

2. **Buffeting** A random oscillation of the structure resulting from unsteady aerodynamic forces, usually associated with separated flow.

3. **Flutter** The unstable self-excited structural oscillation at a definite frequency where energy is extracted from the airstream by the motion of the structure. The deformation and motion of the structure result in forces on the structure that tend to maintain or augment the motion. The displacement modes associated with potential flutter instabilities are often called "flutter modes" even though they may be well damped or do not become unstable within the flight envelope.

4. **Whirl Flutter** Flutter in which the aerodynamic and gyroscopic forces associated with rotations and displacements in the plane of a propeller or large turbofan play an important role. The displacement modes associated with whirl flutter are frequently called "whirl modes."

5. **Divergence** A static instability at a speed where the aerodynamic forces resulting from the deformation of the structure exceed the elastic restoring forces resulting from the same deformation.

6. **Control Reversal** A condition in which the intended effects of displacing a given component of the control system are completely overcome by the aeroelastic effects of structural deformation, resulting in reversed command at higher speeds.

7. **Deformation Instability** The loss of airplane stability and control as a result of the aeroelastic effects of structural deformation.

Aeroelastic considerations relate to FAR 2X.629 requirements. In accordance with the AC 2x.629, considerable judgment is often required to determine the degree of re-evaluation necessary. If the mass, mass distribution, or the stiffness distribution are affected sufficiently to result in possible significant changes in resonant frequencies of major modes, mode shapes, or mass coupling terms in the flutter equations, then some re-evaluation, such as pre-mod and post-mod Ground Vibration Test (GVT) data comparison, or analysis may be required.

Design changes which require such substantiation may only be approved by a design delegation holder with “aeroelastic considerations” included on their Instrument of Delegation.

Dynamic Components

There is no clear definition of the term dynamic component as such, but the term is often associated to rotorcraft in this context for dynamic component classification. If we analyse the term 'dynamic' on its own, it can mean some form of control input in such a way that a transient (time-varying) response of the aircraft is generated.

Aircraft parts that are not exposed to the airflow cannot experience any aeroelastic effects (dynamic or static). A dynamic loss of aeroelastic stability involves a motion. Some components that are not exposed to the airflow may still move.

Some examples in the rotorcraft environment where a component is classified as a dynamic component are below:

- Rotor heads, including hubs, hinges, dampers
- Rotor drive components, including gearboxes and transmission shafts
- Control system components, including control rods, servos, swashplates.

Components that are classified as dynamic components will be referenced in the manuals of the OEM's supplied documentation such as Overhaul Manuals and Maintenance Manuals.

Noting the above examples of dynamic components are in relation to rotorcraft. The intention of the dynamic component condition is not to break down the aeroplane / rotorcraft structure into its core detail of design but rather to categorise the FOC actions to the existing/current FAR requirements.

Reference Documentation

FAA Dynamic Regulatory System

FAA AC 27-1B Certification of Normal Category Rotorcraft

FAA AC23-629-1B Means of Compliance Flutter

FAA AC 25.629-1C - Aeroelastic Stability Substantiation of Transport Category Airplanes