



# Advisory Circular

## AC61-3

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**Aircraft Class Ratings**

**Issue 1**

**01 April 2015**

### **GENERAL**

Civil Aviation Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

This Advisory Circular also includes Explanatory Material (EM) where it has been shown that further explanation is required. Explanatory Material must not be regarded as an acceptable means of compliance.

### **PURPOSE**

This Advisory Circular provides methods, acceptable to the Director, for showing compliance with the aircraft class rating requirements of Rule Part 61 and explanatory material to assist in showing compliance.

### **RELATED CAR**

This AC relates specifically to Civil Aviation Rule Parts 61 Subpart B

### **CHANGE NOTICE**

This AC replace previous Initial Issue dated 01 March 2002.

## **INTRODUCTION**

This advisory circular provides support for Part 61, subpart C, Aircraft Class Ratings. This concept is consistent with ICAO Annex 1, and is a change for Papua New Guinea. The intent is to recognise the similarity between simple aircraft of a similar class and credit the pilot with the privilege of flying such aircraft without the need for a specific type rating.

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## **SUBPART C — Aircraft Class Ratings**

### **Rule 61.73 Eligibility requirements**

- (a) Rule 61.73(2) requires an applicant for an aircraft class rating to have conversion instruction flight experience acceptable to the Director. Attainment of the experience detailed in Appendix I of this subpart advisory circular is acceptable.
- (b) Rule 61.73(3) requires an applicant for a turbine powered aircraft class rating to have a Basic Gas Turbine rating. Attainment of the syllabus detailed in Appendix II of this subpart advisory circular would meet this requirement. An examination credit in the subject of basic turbine knowledge which has been obtained in a foreign country will not normally be recognised in Papua New Guinea unless the applicant has obtained a class rating on a turbine powered aircraft in that country.
- (c) Rule 61.73(4) requires an applicant for an aircraft class rating to demonstrate a satisfactory technical knowledge of the aircraft.
- (d) Rule 61.73(5) requires an applicant for an aircraft class rating to demonstrate competency in that class to a flight instructor. Attainment of the syllabuses detailed in Appendix IV of the Advisory Circular 61-2 to Subpart B would meet this requirement.
- (e) The syllabuses in the Appendices were taken from the New Zealand Civil Aviation Safety Order (CASO) 12 and were updated through their consultative rule-writing process.

### **Rule 61.75 Issue of Aircraft class ratings**

- (a) An aircraft class rating which has been issued by a foreign contracting State to the Convention may be recognised by the Director provided the applicant produces evidence that the class rating was obtained in a manner which meets the requirements of this Subpart.
- (b) Similiar to Rule 61.55(d),an aircraft class rating to include any other aircraft approved as being so similar as to require no further conversion instruction. An aircraft class that has no significant differences, of performance or of handling characteristics, and without any reasonable doubt by anyone concerned as to whether they are the same class, is approved as similar for this purpose.

- (c) The form below is acceptable to the Director for recording class ratings entered in a pilot's logbook.

CLASS RATING CERTIFICATE			
This is to certify that			
.....			
has successfully demonstrated to the flight examiner or to the flight instructor responsible for the conversion instruction, whose signature appears below, technical knowledge of the aircraft and ability to perform competently all normal, abnormal and emergency manoeuvres appropriate to the aircraft class in accordance with the requirements of Civil Aviation Rule Part 61.			
Flight Examiner or Flight Instructor			
Aircraft class	Name, licence class and number	Signature	Date

### Appendix I Aircraft class rating experience

**For a multi-engined aeroplane not exceeding 5700 kg MCTOW;** initial issue — 5 hours, subsequent class — 1 hour.

**For a multi-engined centreline-thrust aeroplane not exceeding 5700 kg MCTOW;** — 2 hours.

**For a single engined aeroplane operating on land only;** 30 minutes.

**For a single engined ski-plane;** using snow as the sole take-off and landing medium — 3 hours.

**For a single engined seaplane;** using water as the sole take-off and landing medium, initial issue — 5 hours, subsequent class — 2 hours.

**For a multi-engined helicopter not exceeding 5700 kg MCTOW;** initial issue — 5 hours, subsequent class — 3 hours.

**For a single engined helicopter not exceeding 5700 kg MCTOW;** initial issue will be coincident with the initial issue of a helicopter pilot licence, subsequent class — 1 hour.

**For any other aircraft;** as specified by the Director.

### Notes

A pilot who has qualified as pilot-in-command on aeroplanes or helicopters in any civil or military capacity may have such conversion time assessed towards meeting the above requirements.

The minimum conversion flight time will be dual instruction unless otherwise specified and will be confined to exercises relative to conversion to the particular aircraft class.

The minimum conversion flight time may include the flight test.

In the case of a single seat class, the instructor issuing the rating is to be satisfied that the pilot has successfully completed ground training to an appropriate level. In addition, before making the appropriate log book entry, the instructor is to personally observe from the ground the pilot's flying of the aircraft and be satisfied that an acceptable level of competence was displayed.

## Appendix II Basic turbine knowledge syllabus

### Theory syllabus

**Basic principles:** Newton's third law of motion and its practical application to the principle of jet propulsion, a practical understanding of how a gas undergoes changes of pressure, volume and temperature in accordance with Boyle's and Charles' Laws, the pressure-temperature cycle, the Brayton cycle, a comparison between the working cycle of a gas turbine engine and a piston engine.

**Engine Types:** Different gas turbine engine types, variations in mechanical arrangements, and their operating parameters, characteristics and use.

**Compressors:** The basic principles of operation of centrifugal and axial flow compressors, rotor blades and stator blades, diffusers, bleed valves, compressor stall.

**Combustion Chambers:** The operation of the combustion chamber, the proportion of air for combustion and cooling, three main types of combustion chamber in use — can or multiple chamber, turbo-annular or can-annular, annular.

**Turbines:** The function of a turbine, multi-stage turbines, design features of nozzle guide vanes and turbine blade passages, the meaning of the terms *impulse* and *reaction* in relation to turbine design.

**Exhaust Systems:** The exhaust gas flow through convergent and divergent passages, comparative noise levels of different types and their means of noise suppression, thrust reversal, its types, components, variations and means of application.

**Fuel Systems:** The basic requirements of a fuel control system, *simplex* and *duplex* type fuel nozzles, pressurising and dump valve, gas turbine fuels, effect of a change in specific gravity, water and water-methanol injection.

**Lubrication:** Lubricating oils and systems, types and requirements for gas turbine lubrication, differences in requirements for turbo-prop, turbojet and turbofan.

**Ignition:** High energy ignition, the starting sequence, re-lighting in the air, precautions when starting and re-lighting, the requirement for continuous ignition.

**Air Cooling and Sealing:** Components cooled, low and high pressure air, types of air and oil seals.

**Engine Instrumentation:** Analysis of engine operation from the following instruments: engine pressure ratio (EPR), turbine inlet temperature (TIT), jet pipe temperature (JPT), exhaust gas temperature or turbine gas temperature (EGT or TGT) (whichever instrument is used to indicate turbine temperature limitations), fuel-flow gauges, RPM indicators, horsepower or thrust indicators, oil temperature and pressure gauges.

**Thrust Augmentation:** Methods, components, and principles involved in thrust augmentation.

**Engine Performance:** Effect of forward speed, ram effect, effect of altitude, effect of temperature and humidity, specific fuel consumption, effect of air intake icing.

**Ice and Fire Protection:** Principles, features and operating parameters of ice and fire protection systems applicable to the various gas turbine engines.

**Starting Malfunctions:** Background theory.

### Simulator syllabus

A practical simulation phase that demonstrates student recognition of starting malfunctions and corrective actions conducted in a simulator approved for this purpose.