



SUMMARY OF CONSULTATION

Summary of New competency standards for the operation of Australian registered gyroplanes

Manual of Standards Part 61

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Overview

From 27 July to 24 August 2020, CASA published CD 2001FS— *New competency standards for the operation of Australian registered gyroplanes* — on the CASA Consultation Hub. The consultation survey invited gyroplane pilots, training organisations, industry stakeholders and other interested parties to comment on the proposed changes to the standards in the Part 61 Manual of Standards (MOS) relevant to flight crew qualifications required to conduct a flight in a gyroplane that is on the Australian Civil Aircraft Register.

All gyroplane operations in Australia are currently conducted in accordance with Civil Aviation Order (CAO) 95.12 or 95.12.1 due to a historical lack of a flight training and a flight examination pathway to enable the grant of Part 61 gyroplane pilot licences. These orders provide exemption from certain requirements in the *Civil Aviation Regulations 1988* (CAR) and the *Civil Aviation Safety Regulations 1998* (CASR) which enable the recreational operation of gyroplanes administered by the Australian Sport Rotorcraft Association Inc. (ASRA). In accordance with the requirements specified in the ASRA operations manual these operations are limited to gyroplanes with a maximum take-off weight (MTOW) of 600 kg (650 kg if equipped to operate on water) conducting private operations and flight training activities. The conduct of flights in gyroplanes under ASRA administration can be conducted only as a private operation.

Commercial operations are not permitted in a gyroplane registered with ASRA. Commercial operations can only be conducted in gyroplanes that are on the Australian Civil Aircraft Register which requires the pilot-in-command to hold a flight crew licence issued in accordance with the requirements specified in Part 61 of the *Civil Aviation Safety Regulations 1998* (CASR) - Flight Crew licensing.

With the commencement of Part 61 of CASR, CASA introduced a Part 61 MOS which describes the knowledge and practical competency standards that must be met prior to the grant of a licence, endorsement or rating. In anticipation of a need to issue flight crew authorisations for pilots of such aircraft, Part 61 of CASR provided a licensing framework for powered-lift, airship and gyroplane aircraft categories. Consequently, within the development of the Part 61 MOS, there were some sections reserved to allow for the development of the standards necessary to ensure the safe operation of these aircraft by appropriately trained and qualified pilots. The proposed new standards, including the conduct of commercial operations in gyroplanes integrates with the present suite of competency standards and harmonise with other international standards.

There has been no previous consultation on competency standards for flight crew authorisations applicable to the operation of registered gyroplanes.

This summary of consultation includes a discussion of the main themes that emerged in a review of the responses.

Respondents

We received a total of eleven (11) submissions from eleven (11) respondents. Nine respondents consented to having their comments published on the CASA website.

Of the respondents, three (3) identified as an instructor or flight instructor, five (5) identified as pilots and the other two (2) respondents represented a self-administering aviation organisation, including the chief training pilot for ARSA and a member of the international review team for the International Association of Professional Gyroplane Training (IAPGT).

Key feedback

There was strong agreement that the proposed standards are sufficient to ensure that private and commercial pilots operate a gyroplane safely, whilst harmonising with the present suite of Part 61 standards. A number of the responses were items for the training syllabus and will be considered in their development. However, there were three major themes that generated significant comments related to side slip, ground resonance and translational lift. There were also other suggested changes and clarification to terminology. This feedback has resulted in additional research and direct consultation with ARSA and has resulted in a number of changes being made to the MOS.

Theme 1 - Side slip

Feedback was received relating to side slip with comments to the effect that reference to sideslip and sideslipping should be deleted from the MOS. These comments included:

...."side slipping should not be performed in a gyroplane, this is dangerous. refer to ASRA safety alert 2014.02. In basic manoeuvres, performing a vertical descent should be accomplished, and no need for side slipping"....

....."effect of sideslipping - leads to gyroplane rolling over into an unrecoverable position".....

...."One change which should be made to the training syllabus is to omit "Side Slips" or better still, state that they are not permitted except if stated to be allowed by the manufacturer".....

CASA response

To address this issue, it should be noted that CASA is aware of ASRA Safety Alert No: SA 2014, dated 4th August 2014, and of the relevant safety risks involved in conducting what the Safety Alert refers to as 'extreme sideslipping'. The Safety Alert asserts that

"There can be no justification whatsoever for a gyro pilot deliberately setting up a cross controlled situation, given the risks and hazards outlined above".

CASA accepts there are safety risks involved with conducting a sideslip in a gyroplane which have resulted in a number of fatal accidents. It is also noted that certain factory-built gyroplane Pilot Operating Handbooks (POH) devote a section covering the 'prohibition of extreme sideslip'. Additionally, the sideslip manoeuvre is not normally utilised in a gyroplane to increase the rate of descent or steepen the descent of a gyroplane.

CASA agrees with the respondents and has amended the proposed standards to remove the requirement for gyroplane pilots to demonstrate competency in performing a sideslip and recognises the technique may need to be applied, to some extent, in close proximity to the ground, in order to safely complete a crosswind landing. To comply with such limitations where specified in the flight manual or POH for the aircraft, flight training and the associated underpinning knowledge of the standards should ensure gyroplane pilots recognise and avoid extreme sideslipping.

Theme 2 - Ground resonance

Feedback was received about the applicability of ground resonance in relation to gyroplane operations compared to helicopter operations, as it is a phenomenon that is usually only experienced in articulated rotor system designs. If not corrected, ground resonance can cause serious damage in a matter of seconds. (See Figure 1 below).

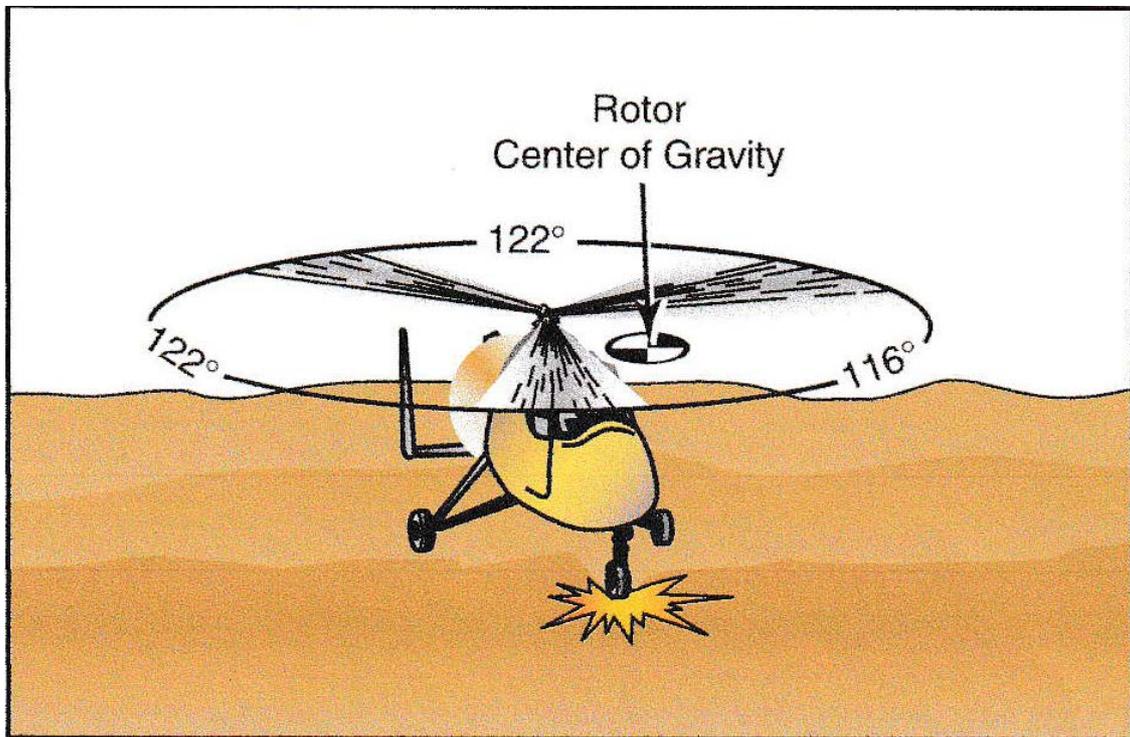


Figure 1 - Taxiing on rough terrain can send a shock wave to the rotor system

CASA response

While such rotor systems are not typical of many existing gyroplanes it is possible that some gyroplane designs could incorporate articulated rotor systems that are susceptible to ground resonance. Consequently, gyroplane pilots should be aware of its existence and the measures used to prevent ground resonance to mitigate the associated risks.

To ensure pilots are aware of the existence of the phenomena that they might encounter when operating gyroplanes fitted with such rotor designs the reference to ground resonance is in the knowledge standards. As an underpinning knowledge requirement pilots would be expected to

describe the techniques used to avoid ground resonance and the appropriate actions in the event it is encountered.

Theme 3 - Translational lift

Translational lift is currently mentioned in the draft as part of required knowledge for a licence and several responses stated that it was only applicable to helicopters.

CASA response

CASA disagrees with this position and accepts the definition set out in Gyroplane Flight Training Manual (1989).

Translational lift is the additional lift obtained when a gyroplane enters translational flight due to increased rotor system efficiency. The rotor system generates greater lift in translational flight because the increased airflow velocity supplies the rotor disc with a greater mass of air per second upon which to work than it receives in vertical descent, i.e. V^2 term of the lift equation is increased. Translational lift is present during any horizontal motion of the gyroplane though in general is not noticeable until the airspeed reaches 15 mph.

It is important to note that the reference to 'translational lift' is not referring to the special case of 'Effective Translational Lift'. More broadly it is the effect of increasing forward airflow on the rotor efficiency. The effect of translational lift is evident in the power required to maintain level flight as a gyroplane accelerates from the minimum airspeed required for level flight to the airspeed for minimum power in level flight.

Other suggested changes and points that required clarification of the terminology included the following:

- Elaboration on use of the term *brakes* to differentiate between rotor and wheel brakes.
- Change in terminology from *zero groundspeed* to *zero airspeed*, where it is referenced in the standards for vertical descents, and the description of safe vertical descents, as a practical standard, to enhance the safety of such activities when developing piloting skills.
- The inclusion of safe vertical descent as a practical standard to enhance safety and develop pilot handling skills.
- Provide clarification and differentiation on the terminology used to describe operations at the *backside of power curve* and *behind power curve* where included in the knowledge and practical standards for slow flight or level flight at minimum airspeed.

Future direction

CASA thanks the many highly qualified people and organisations contributing their time and thought to this consultation and acknowledges the feedback as beneficial to the effectiveness of the consultation process.

There was strong agreement that the Part 61 MOS is amended to include new standards for gyroplane flight crew licensing, and in doing so there would be no unintended consequences that would adversely affect safety of flight gyroplane flight operations.

CASA recognises there are safety risks associated with the conduct of flight training which must be managed by operators and flight instructors. Competency standards specified by CASA should never result in a pilot exceeding any limitations specified in the aircraft flight manual. That is, flight training activities should always be conducted within the limitations of the aircraft used to conduct the training. Flight training operators must ensure the aircraft used to conduct the training activities is suitable for achieving the training task.

Based on industry feedback, CASA will adopt these new standards and will undertake the following activities:

- Amend the Part 61 MOS to include new gyroplane competency standards.
- Publish sample syllabuses on the CASA website for gyroplane licensing .
- Further advisory and educational materials will be made available on the CASA website.
- CASA anticipates publishing the proposed changes to the Part 61 MOS in November 2020.

Provide a pathway for suitably experienced and qualified individuals to conduct training and testing for the new PPL(Gyroplane) and CPL (Gyroplane).

- Communicate more broadly with training operators and organisations in this sector to raise awareness of the upcoming changes and how they may apply for a Part 141 approval.