




SUMMARY OF CONSULTATION



Proposed amendments to Part 61 Manual of Standards - Spin avoidance and stall recovery training

Part 61 Manual of standards

Date September 2020

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Overview

Recent fatal accidents have highlighted the risks associated with stall and spin avoidance training. Recovery from departures from controlled flight, particularly stall and spin, have long been a required competency in flying training and are described in the Part 61 Manual of Standards (MOS), which states the units of competency and the level of competence required for the issue of pilot licences, ratings and endorsements.

The Part 61 MOS supports the ongoing activities of Part 61 of the *Civil Aviation Safety Regulations 1998* (CASR) – Flight Crew Licensing. The regulations require that training for a flight crew licence or rating must be conducted by an operator authorised by CASA under Parts 141 or 142 of the CASR in accordance with an approved syllabus of training. The training and assessment must be conducted by a person authorised by CASA to the standards specified in the Part 61 MOS.

Advisory Circular (AC) 61-16 v1.0 Spin avoidance and stall recovery training, published in May 2020, was part of CASA's responses to the Australian Transport Safety Bureau's (ATSB) investigation *AO-2017-096 Collision with terrain involving Diamond DA40, VH-MPM* and subsequent safety advisory notice *AO-2017-096-SAN-012 Is incipient spin training permitted in your aircraft?*

The purpose of AC 61-16 v1.0 is to:

- clarify the definitions of wing drop at the stall and the incipient phase of a spin
- provide information regarding the interpretation of aircraft flight manual manoeuvre limitations with respect to intentional spinning
- promote safer practices around the advanced stall exercise, particularly about recovery from wing drop at the stall and avoidance of spins.

Publication of the AC precipitated a requirement to amend standards for advanced aeroplane manoeuvres, particularly parts of the stalling exercise known in the Part 61 MOS as the 'incipient spin manoeuvre'. The purpose of the changes is to remove any ambiguity in terminology and to assure training standards safely achieve desired outcomes.

Public consultation from 26 May 2020 to 26 Jun 2020 gained feedback on the proposed amendments to the following Part 61 MOS schedules:

- Schedule 2 - Competency standards
- Schedule 5 - Flight testing standards.¹

The proposed amendments remove the requirement for the induction of, and recovery from, spins at the incipient stage during flight training in favour of spin avoidance training with greater emphasis on slow flight, stall recognition and recovery from wing drop at the stall. This makes it consistent with spin avoidance and stall recovery training principles specified by the International Civil Aviation Organization (ICAO) for upset prevention and recovery training (UPRT).

¹ The changes to schedule 5 were brought about by the publication of the AC 61-16 v1.0.

Executive summary

From 26 May 2020 to 26 Jun 2020, CASA conducted public consultation regarding proposed amendments to the Part 61 MOS Schedule 2 Competency standards and Schedule 5 Flight testing standards which was brought about by publication of *AC 61-16 v1.0 - Spin avoidance and stall recovery training*.

The proposed amendment would remove the requirement for the induction of, and recovery from, spins at the incipient stage in favour of spin avoidance training with greater emphasis on slow flight, stall recognition and recovery from wing drop at the stall, making Australian training practice consistent with spin avoidance and stall recovery training principles specified by ICAO for UPRT.

The consultation consisted of a two-question survey asking if the proposed amendments would reflect the change in policy as set out in AC 61-16 v1.0, and if adopted, would it create any unintended consequences. Following each question was an opportunity to provide comment, and at the end of the survey a free text field was provided for further comment.

CASA received 16 responses from industry and individuals.

Predominantly, responses were in support of the proposal and they indicated that the proposed amendments to the Part 61 MOS were consistent with the training guidance in the AC, and that adoption of the amendments would create no unintended consequences.

Some responses referred to Recreational Aviation Australia (RAAus) aircraft and operations, noting that aircraft certified as light sport aircraft can be VH registered and used to conduct Part 141 or 142 flight training. The consultation and summary are limited to commentary on aircraft used in the conduct of training by a Part 141 or 142 operator, and the conduct of flight tests, for the grant of a Part 61 flight crew licence or rating.

Some responses and comments across all questions which did not support, or provided qualified support for the proposal, were of similar themes to those made during the consultation for [AC 61-16 v1.0 - Spin avoidance and stall recovery training](#), and have already been responded to in that Summary of Consultation.

From the feedback provided, CASA is satisfied that adoption of the proposed amendments into the Part 61 MOS will provide clarity to the flight training industry, and enhance safety, in the conduct of spin avoidance and stall recovery training. Removal of the requirement for students to demonstrate recovery from a spin at the incipient stage for the issue of a licence in no way prevents an operator who conducts flight training in aircraft approved for spinning from delivering such flight training.

CASA acknowledges the contributions made by the respondents and appreciates the feedback as beneficial to the effectiveness of the consultation process.

Discussion

AC 61-16 v 1.0 highlighted to pilots generally, flight training operators and instructors the risks associated with advanced stalling training when conducted in aircraft that are not certified for intentional spins. It proposed the move to training recovery from wing drop at the stall from the present 'incipient spin manoeuvre', precipitating this proposed amendment to the Part 61 MOS.

In order to gather maximum feedback and data, relevant questions were asked in both an open and closed format and respondents were encouraged to provide detailed comments against the proposed change. The respondents had the opportunity to voice concerns, raise related issues and offer suggestions and opinions using their knowledge and experience. The collection of both quantitative and qualitative data enabled a comprehensive analysis to be undertaken.

Several issues raised by respondents have been addressed by CASA in the Summary of Consultation (SOC) to AC 61-16. Consequently, this consultation and summary is limited to new commentary on the proposed amendments related to training and activities conducted by Part 141 and 142 operators in aeroplanes and related testing practices.

Respondent overview

CASA received 16 responses from 16 respondents. 3 (18.75%) respondents identified as licensed pilots, two (2) respondents (12.5%) were flight instructors and 3 respondents (18.75%) represented a Part 141 operator. Five (5) respondents (31.25%) did not identify as being from any of the above groups: however, all were pilots with additional qualifications; Part 141 operators, Training Industry Representative Organisations, Self-Administering Organisations, instructors, examiners, and an airline flight simulator instructor.

Of the 16 respondents, 7 of the 9 individuals, and 5 of the 7 respondents who represented organisations gave permission for their responses to be published on the CASA Consultation Hub web page.

Quantitative data

The 16 responses were initially assessed to determine whether the respondent opposed or supported, the proposed amendments.

The level of support for the proposed amendments was high with the majority (12 of the 16 respondents; 75%) agreeing that, once in force, the Part 61 MOS amendments will reflect the guidance information set out in AC 61-16 v1.0. Three (18.75%) respondents disagreed and one (6.25%) respondent did not respond to this question. Three respondents chose to add written feedback.

To the second question whether, once in force, the Part 61 MOS amendments will not create unintended consequences; 10 (62.5%) agreed and 6 (37.5%) disagreed. 6 respondents chose to add written feedback.

Proportions of the level of support by question is shown in Table 1. Suggested changes and opposing points of view that have not already been responded to in the SOC - AC 61-16 v1.0 Spin avoidance and stall recovery training will be discussed in the analysis of responses which follows.

Table 1 – Level of support by question

Question	Yes		No		Not Answered	
Do you agree that once in force, the Part 61 MOS amendments will reflect the change in policy as set out in AC 61-16 v1.0?	12	75.00%	3	18.75%	1	6.25%
Do you agree that once in force, the Part 61 MOS amendments will not create unintended consequences?	10	62.50%	6	37.50%	0	0.00%

Qualitative data

Each respondent was provided an opportunity to elaborate on their answer to each question in plain text. Comments made following each of the questions, and at the conclusion of the survey, were analysed and collated for consideration in the discussion under each question.

Eleven (11) of the respondents provided additional comment in the free text field following the two survey questions.

Qualitative responses were generally in agreement with each question but provided further comment and some suggestions for changes.

Question 1 - Do you agree that once in force, the Part 61 MOS amendments will reflect the change in policy as set out in AC 61-16 v1.0?

Option	Total	Percent
Yes	12	75.00%
No	3	18.75%
Not Answered	1	6.25%

Three (3) respondents provided text comment to this question, two (2) responded 'no' to the question and one did not provide a yes or no response.

Of the respondents who disagreed, the main theme was that pilots should be trained to recover from a spin at the incipient stage or beyond, and that the proposal reduces the extent of training which would result in further accidents due to the inability to recover from a spin, or a lack of awareness of what they were being trained to avoid.

Additionally, the point was made by one respondent that flight training operators should at least have access to aircraft certified for intentional spinning.

CASA's response

These points have previously been addressed by CASA in the SOC to the AC 61-16.

CASA continues to encourage exposure to spinning and spin recovery in aeroplanes approved for spinning with a qualified instructor to round out a pilot's awareness; however, the safety enhancement is achieved in training for spin avoidance.

One (1) respondent suggested the introduction of minimum height loss as a criterion for assessment of competence of stall recovery:

"Suggested amendment to the following references:

Section 2 Elements and performance criteria.

2.1 (f) suggest rewording to reference "Perform stall recovery with minimum height loss of 200 feet".

Rather than refer to simulated low level flight, a preference for flight tolerances to be provided in Part 61 MOS to refer to competency in minimum height loss for recovery with these manoeuvres."

CASA's response

National aviation authorities worldwide have shifted emphasis in stall recovery training from minimum height loss to energy management and reducing angle of attack in order to reduce the occurrence of accidents due to secondary or accelerated stalls during the recovery sequence. The focus of spin avoidance and UPRT literature is on regaining control rather than minimising height loss in the first instance. The CASA Flight Examiner Handbook echoes this in all references to the stalling exercise: "The examiner should place emphasis on the application of correct technique rather than the achievement of minimum height loss."

Comment was also made regarding the removal of some words in the underpinning knowledge for the section including slow flight:

"Underpinning Knowledge Section 3 (g), the proposal to remove the reference to "Hazards of unbalanced flight" removes one of the core principles to enable a pilot to understand potential consequences of operating an aircraft in an unbalanced state."

CASA's response

The removal of these words removes a duplication in section (b)(iv) of the same section. They remain extremely important underpinning knowledge.

Question 2 - Do you agree that once in force, the Part 61 MOS amendments will not create unintended consequences?

Option	Total	Percent
Yes	10	62.50%
No	6	37.50%
Not Answered	0	0%

Six (6) respondents provided comment to this question.

One 'yes' respondent who provided feedback, and one 'no' respondent also, disliked the use of the phrase 'wing drop', preferring to retain 'incipient spin'.

In addition, among the 'no' responses and throughout the survey, respondents expressed concern that the reduced extent of advanced stall recovery training would result in further accidents due to inability to recover from a spin, or the lack of awareness in what pilots were being trained to avoid.

CASA's response

These points have previously been addressed by CASA in the SOC to the AC 61-16. For clarity, the word 'incipient' will be removed from the Part 61 MOS where reference is made to stalling.

One respondent suggested to reflect current slow flight and stall training, the use of the term 'slow flight' should be replaced with 'flight at high angles of attack':

"...a small percentage of the briefing is dedicated to flight at or beyond the Critical Angle of Attack. A larger percentage of the briefing is dedicated to how the Stalling Speed changes with changes in Power, Flap, G force, Angle of Bank, Weight, etc, however this provides some, but minimal practical knowledge to the student that they can apply in an aircraft. AC 61-16 emphasis is in the incorrect place with discussion around slow speed flight as an exercise, as opposed to flight at high angles of attack."

Similarly, the respondent observed that stall, akin to the 'incipient spin manoeuvre' is often taught as a manoeuvre instead of a mode of flight which can occur unexpectedly:

"The current briefing describes in detail how to set the aircraft up for, perform and recover from a wings level power off stall, without even exploring the practical application of the exercise. a student can perform a stall at altitude, but then fails to see the approaching stall when given an engine failure after take-off.

Many instructors are not comfortable with stalling as they do not understand what is going on."

Several technical and writing suggestions were made by the same respondent which will be considered for inclusion in the amendment, in particular:

SLOW FLT performance criteria (a) would be better replaced with something like "aircraft correctly configured for the intended slow flight manoeuvre" as this more generic and applies to all manoeuvres.

Performance Criteria (c) (iii); earlier version of FAR 23 and don't have a stall warning device such as the Super Cub. Some Light Sport aircraft from my experience are the same, as are some homebuilt aircraft. Could I suggest that this be changed to "flight at speeds between 1.1 and 1.2 Vs". This would achieve the result in any aircraft.

Performance Criteria (d) could be re-written to say "except for multi-engine aeroplane operations, observe audible and visual stall warnings, and note aft control column (stick) position and recover aeroplane to flight in excess of 1.3 Vs at a lower Angle of Attack.". Once again, this starts to get instructors and students thinking more about Angle of Attack as opposed to airspeed.

"A5.1, different approach to this part of the training. Once again, I believe that this part of flight training is being conducted as a manoeuvre, as opposed to emphasis being

placed on real world application. Too much emphasis is being put on making the aircraft stall prior to recovery; emphasis needs to be placed on an awareness of an impending stall, and recovery initiated prior to the aircraft stalling, and as such I would suggest the following changes:

A5.1 – Recover from Impending Stall

- (a) Recognise the following symptoms of an impending stall by identifying two or more of the following:
 - (i) Control Column (stick) aft of neutral
 - (ii) Audible warning or visual signals of impending stall
 - (iii) Potentially light airframe buffet
- (b) Recover the aircraft from an impending stall by reducing Angle of Attack using smooth and coordinated control inputs before the aircraft enters a fully developed stall.
- (c) Recover from an impending stall in the following conditions:
 - (i) Straight and Level Flight;
 - (ii) A climbing turn in the take-off configuration;
 - (iii) A descending turn in the approach configuration;
 - (iv) A climb in the missed approach configuration;
 - (v) A steep level turn;

A5.2 – Recover from Stall

- (d) Recognise the symptoms of a fully developed stall by identifying:
 - (i) Control Column (stick) aft of neutral;
 - (ii) Audible warning or visual signals of impending stall;
 - (iii) Airframe buffet;
 - (iv) A nose down pitching tendency of the aircraft
 - (v) Loss of directional stability (wing drop)
- (e) Recover from a fully developed stall by performing the following:
 - (i) Reduce Angle of Attack
 - (ii) Minimize Yaw
 - (iii) Use available power and height to increase the aircraft energy state
 - (iv) Avoid Secondary Stall
 - (v) Re-establish desired flight path and aircraft control with balanced control application
- (f) Perform a stall and recovery in the following configurations
 - (i) Straight and Level flight
 - (ii) Approach configuration (flap and power)
 - (iii) Level Steep Turn

CASA's response

As a result of the consultation process, it is apparent that there has been over many years a drift in interpreting the meaning of and the significance of differences between wing drop at the stall and the incipient phase of the spin. The identified changes to the Part 61 MOS, associated with recent publication of CASA AC 61-16 on stall and spin avoidance training, will address these confirmed differences and inconsistencies in courses of training required by Part 61.

To conduct training for any licence, rating or endorsement a Part 141 or 142 operator is required to develop a course of training which must deliver pilot competency to the standards and tolerances prescribed in the MOS. To assist these operators further CASA will be developing additional guidance material with proposed amendments to the CASA Flight Instructor Manual utilising scenario-based training methodologies to enhance advanced stalling training outcomes.

Recognising the safety risks inherent in flight training, operators have a responsibility to ensure their instructors are competent to conduct flight training for the operator. They are required to ensure their instructors maintain the required competency to conduct stall and spin avoidance training safely.

Free text responses to the proposed amendments

Eleven (11) respondents provided comments in the free text field provided at the end of the survey.

Many comments reflected the positive quantitative responses.

"I feel that the proposed change is a better description of what is intended and will clear up a significant grey area in the flight training requirements"

"In the absence of widespread availability of suitable aircraft and suitably qualified instructors this seems like reasonable policy.

Further practical and writing style advice was also supplied in a number of responses.

"With reference to Scenario where go-around from approach configuration (significant change to trim state). Recommend the configuration be amended from approach configuration to landing configuration. Reason: Approach configuration implies less flap is extended depending on aircraft type. There may be additional airspeed until such time landing flap is selected when the approach speed is reduced to standard for full flap (depending on aircraft type) A Go Around at low altitude in the landing configuration can be significantly more critical because of the lower IAS and greater yaw and pitch up."

"Re Stalling in Turns in Slow Flight. An example of this manoeuvre is the so-called Precautionary Search which includes manoeuvring around a selected landing field. at low altitude and reduced airspeed. Currently this is not mentioned as an example of slow flight."

CASA's response

Where appropriate, these scenarios and others, which are common components of flight, are included in the amendment and are published in advisory and educational materials CASA produces from time to time.

The AC provides the operational scenarios most commonly associated with stall/spin accidents.

Many responders agreed that the amendment was beneficial; however, added that exposure to spinning, and being trained to recover, were also beneficial, especially to instructors.

"It sounds to me like the proposed training for recognition and prevention of a stall is fine, without having to induce an incipient spin in an aircraft "not" designed for spinning. I would like to input though that during training for an instructor rating, my instructor ensured that I experienced some spin exposure and ability to recover from same in an aircraft rated for spinning, "didn't take all that much exposure to get the idea". Down the track, that training enabled me to recover from an inadvertent spin with a student in an aircraft not rated for spinning.

CASA's response

CASA encourages student pilots to gain experience in spinning and recovery in aircraft certified for intentional spinning. Licensed pilots may add to their suite of skills with spinning flight activity endorsements or spinning training endorsements. A training operator with aircraft certified for intentional spinning and instructors qualified to conduct spinning training will have the capacity to deliver the above.

One respondent who agreed with the amendment in both questions sought a safety case for the change:

"To be consistent with the change policy required of 141 and 142 certificate holders CASA must publish the safety case that resulted in the change to stall training and examination that came with Part 61."

CASA's response

The amendment is in response to several stall training accidents both within Australia and internationally over many years. The changes harmonise with International standards and those of other foreign NAA's.

[AC 61-16 v1.0 - Spin avoidance and stall recovery training](#) provides the explanation for the amendments and refers to prior studies which make the safety case for change.

Summary and next steps

CASA thanks the many highly experienced people and organisations who contributed their time and input and acknowledges the feedback as beneficial to the consultation process.

There was strong agreement that the proposed amendments to the Part 61 MOS schedules 2 and 5, reflect the change in spin prevention and stall recovery training set out in AC 61-16 v1.0, and that there would be no unintended consequences which would adversely affect safety of training or training outcomes.

Based on industry feedback, CASA will adopt the policy taken by ICAO and other national aviation authorities to replace training and testing in the induction and recovery from the incipient stage of a spin with training in spin avoidance and the recovery from a stall with a wing drop.

CASA will undertake the following activities:

- The Part 61 MOS will be amended to replace reference to the 'incipient spin manoeuvre' with 'recovery from wing drop at the stall'. This will make it consistent with the proposal that formed the basis of this consultation.
- The sample syllabuses available on the CASA website will be amended to incorporate the changes made to the Part 61 MOS.
- The Flight Instructor Manual will be reviewed and amended in accordance with the AC and consequential MOS amendments.
- The Flight Examiner Handbook and Flight Test Forms will be amended in accordance with the AC and consequential MOS amendments.
- Direct contact will be made with Part 141 and 142 operators and organisations conducting flight activity endorsement training to raise awareness of the upcoming changes to flight training practises.
- Further advisory and educational materials will be made available via the Aviation Safety Advisory team and on the CASA website.

CASA anticipates publishing the proposed changes to the Part 61 MOS in September 2020.

Three months will be provided for Flight Training Operators to modify their syllabuses and expositions. These changes are not considered to be significant.

The proposed changes will commence in the fourth quarter 2020.