



# SUMMARY OF CONSULTATION



## Spin avoidance and stall recovery training

**Date** April 2020  
**File ref** D20/30462

## Overview

The main objective of the *Civil Aviation Act 1988* (the Act) is to establish a regulatory framework for maintaining, enhancing and promoting the safety of civil aviation, with an emphasis on preventing aviation accidents and incidents. This regulatory framework is supported by Manuals of Standards (MOSs), Advisory Circulars (ACs) and other forms of guidance and educational material.

This first proposed draft AC 61-16 v1.0 supports the ongoing activities of Part 61 of the *Civil Aviation Safety Regulations 1998 (CASR)* – Flight Crew Licensing, where the regulations require that training must be conducted by an operator authorised by CASA under Parts 141 or 142 of CASR, in accordance with an approved syllabus of training. The training and assessment must be conducted by a person authorised by CASA and satisfy the standards specified in the Part 61 MOS.

Following the investigation and subsequent release of an Australian Transport Safety Bureau report into a flight training accident, CASA determined changes needed to be made to the description of standards for advanced aeroplane manoeuvres, in particular the incipient spin manoeuvre. The purpose of the changes is to remove any ambiguity in the terminology and possible training methods. Training operators were alerted to the need to ensure aircraft they used for flight training were suitable for the manoeuvres being performed.

The primary aim of the consultation was to gain feedback on the draft AC, the purpose of which is to minimise the risks associated with advanced stalling training and minimising the potential for negative transfer of skills during training.

The proposed AC provides information and guidance regarding the conduct of advanced stalling exercises; in particular, stalls with a wing drop. Differences between wing drop at the stall and spin at the incipient stage are clarified, certification standards intended to provide margins of safety in specific modes of flight are discussed, and methods of training and practice are provided.

## Executive summary

CASA conducted public consultation regarding draft AC 61-16 v1.0 - *Spin avoidance and stall recovery training*, from 18 December 2018 to 27 January 2019. The draft AC proposes additional safety requirements and guidance in the practice of advanced stall training that will require associated amendment to the Part 61 MOS. The proposed amendment would remove the requirement for flight training in the induction and recovery of 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 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).

CASA received 75 responses to the survey, of which 15 represented organisations. The survey consisted of seven multiple choice questions rating level of agreement with aspects of the proposal. Following each question was an opportunity to provide comment regarding that topic. Each topic attracted between 31 and 56 comments. Numbers of comments for each are listed later in this evaluation. Thirty-nine of the respondents provided additional written feedback of a general nature. All responses were evaluated to determine whether respondents opposed, supported, or supported with some changes, the draft AC.

Responses were predominantly in support of the proposal and indicated that the AC was fit for purpose.

Some responses referred to Recreational Aviation Australia (RAAus) and The Gliding Federation of Australia (GFA) aircraft and operations. This consultation and summary is limited to commentary on aircraft used in the conduct of training by a Part 141 or 142 operator authorised by CASA, and the conduct of flight tests, for the grant of a Part 61 flight crew licence or rating.

Of the responses and comments across all questions which did not support, or provided qualified support for the proposal, the following themes were identified:

- A high level of support for training and testing of spin recovery balanced with recognition that there are fewer instructors and a shrinking fleet of aircraft capable of delivering this outcome.
- Mandating training and testing of spinning, requiring all training to be conducted in aircraft certified for intentional spinning, would be cost prohibitive to students and industry.
- Insufficient guidance regarding training for slow flight, stalling and stall with a wing drop.

From the feedback provided, CASA is satisfied that the draft AC, with enhancements drawn from the large volume of constructive feedback, will serve its intended purpose.

It explains:

- That caution should be exercised when conducting advanced stalling training.
- How to determine if an aeroplane is approved for conducting intentional spins.
- The change in terminology from 'incipient spin manoeuvre', to 'recovery from stall with a wing drop'.
- The underlying reasons for conducting the flight training activity.

The following changes to the draft AC will be made:

- It will be edited to include additional information on scenario-based training and the execution of slow flight and stalling exercises.
- A consultation will be conducted for the amendment of Part 61 MOS to remove the requirement for entry and recovery from spins at the incipient stage, in favour of avoiding spins with increased emphasis in stall awareness and training recovery from wing drop at the stall. This will make it consistent with the proposal that formed the basis of this consultation.
- The Flight Instructor Manual will be reviewed and amended in accordance with the AC and the consequential MOS amendments.
- The Flight Examiner Handbook and Flight Test Forms will be amended in accordance with the AC and the consequential MOS amendments.

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 highlights to flight training operators and instructors, the risks associated with advanced stalling training when conducted in aircraft that are not certified for intentional spins, and to minimise the potential for negative transfer of training.

In order to gather maximum feedback and data, relevant questions were asked in both an open and closed format with respondents encouraged to provide detailed comments on 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.

This consultation and summary is limited to commentary on aircraft, training and testing practices within Part 141 and 142 flight training operations. Some responses referred to RAAus and GFA aircraft and operations.

## Respondent overview

CASA received 75 responses with 30 (40%) respondents identifying as licensed pilots, none being student pilots. Nineteen (19) respondents (25%) were flight instructors and 11 respondents (15%) represented a Part 141 or 142 operator. Twelve (12) respondents (16%) did not identify as from any of the above groups however all were pilots with additional qualifications including aeronautical engineers, test pilots, senior flight instructors and examiners, and representatives of pilot associations. Three (3) respondents (4%) chose to not answer the question. (figure 1).

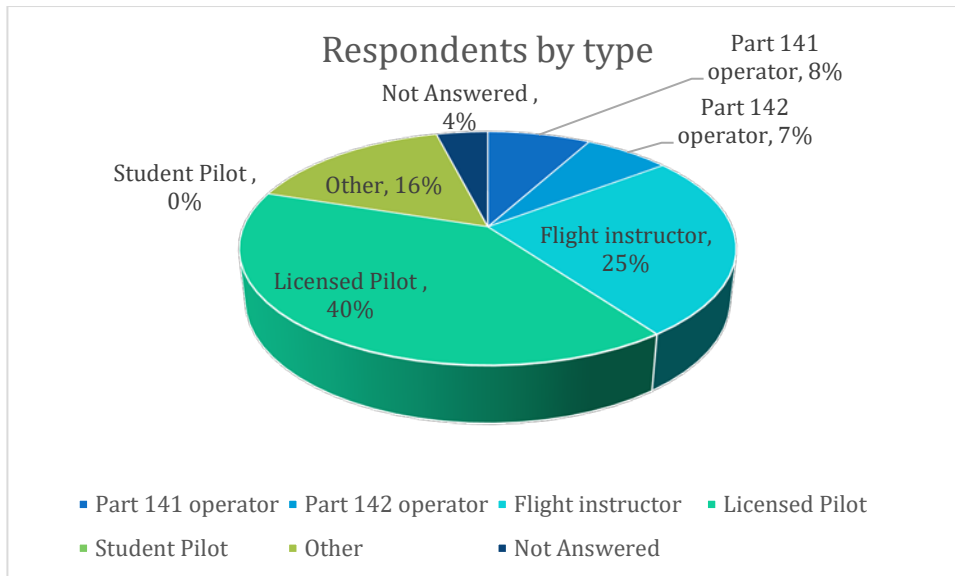


Figure 1 - Type of respondent across total submissions to consultation hub<sup>1</sup>

<sup>1</sup> Type of respondent was n =73 as two respondents choose not to answer.

## Quantitative data

Each of the 75 responses were initially assessed to determine whether the respondent entirely opposed, fully supported, or supported the proposal but with changes.

The level of support for the proposed AC was high with the majority of respondents agreeing (47%), or agreeing with some changes (35%), that the AC was fit for purpose and that replacement of incipient spin with stall with a wing drop in training and testing would produce competent pilots able to avoid a spin. Eleven percent (11%) of respondents opposed some or all of the proposed changes and 3% of respondents indicated it was not their area of expertise.

Following this initial assessment, each of the 75 responses was analysed against the seven specific questions<sup>2</sup> raised in the AC. Seventy-three (73) respondents answered all questions. Thirty-nine (39) respondents made general comments in the free text field provided at the end of the questionnaire.

Support for the proposed change in training and testing 'incipient spin' to 'stall with a wing drop' was strong, with the majority of respondents to questions one to four agreeing (44-53%) that the AC is fit for purpose and would enable an instructor to train, and a student to be trained, to competence in spin avoidance. A further 19-35% agreed the AC was fit for purpose, but with some changes, while 12-25% disagreed.

While there was support for the change to spin avoidance rather than spin recovery training (questions one to four), 52% of respondents felt recovery from spins should be trained (question five) and 41% also felt it should be tested (question six) for at least some levels of licence. Most of these respondents however also recognised in their comments the negative economic and practical impacts a change such as this would incur, and that gaining the experience of a spin and recovery so that a pilot knows what they are avoiding was the most important point raised. This awareness was also borne out in the general disagreement (54%) that flying schools should conduct all training in aircraft certified for intentional spinning (question 7).

Twenty-nine (29%) and 43% respectively disagreed with a requirement to train (question 5) or test (question 6) recovery from spins for the grant of a pilot licence.

---

<sup>2</sup> Hyperlink to the survey questions.

SUMMARY OF CONSULTATION ON  
SPIN AVOIDANCE AND STALL RECOVERY TRAINING

Proportions of the level of support by question is shown below. Suggested changes and opposing points of view will be discussed in the analysis of responses which follows.

**Table 1 – Level of support by question**

Question	Agree	Agree, but with changes	Disagree	Not my area of expertise	Not Answered
1 Is this AC fit for purpose?	47%	35%	11%	4%	3%
2 Do you agree the recovery from wing drop at the stall training proposed in this AC, will enable a pilot to safely avoid a spin?	44%	29%	21%	3%	3%
3 Do you agree the advice provided in this AC will enable a flight instructor to improve the way in which they teach spin avoidance?	53%	19%	19%	6%	3%
4 Is the instruction in spin avoidance in the proposed AC sufficient to ensure competence in this area, when qualifying for a pilot's licence?	45%	19%	25%	8%	3%
5 Do you think instruction in recovery from spins should be required training for the grant of a pilot's licence?	52%	13%	29%	3%	3%
6 Do you think testing a pilot's ability to recover from spins should be a required component of pilot licence flight test?	41%	11%	43%	3%	3%
7 Should flight training organisations be required to conduct all training for the grant of Recreational, Private and Commercial Pilot Licences, in aircraft certified for intentional spinning?	24%	16%	54%	3%	3%

Each respondent was provided an opportunity to elaborate on their answer to each question in plain text. Volumes of responses were generally largest from respondents agreeing but providing suggestions for changes.

## Provisions that received majority support

The following questions received majority support (greater than 65% agreed, or agreed, but with changes). CASA will implement the proposed changes.

Feedback on the questions was analysed and collated for consideration in the discussion under each question.

### Question 1 - Is this AC fit for purpose?

Of the 82% of supportive respondents 47% agreed, and 35% agreed with changes.

Forty (40) respondents provided comment to this question.

Comments regarding changes were of a constructive technical and editorial nature without changing the meaning of the explanations provided, or the arguments for substitution of 'incipient spin manoeuvre' as it appears in Part 61 MOS with 'stall with a wing drop'.

Some commented the AC was too long, or wordy and a similar proportion commented that it should be more specific. Requests for additional content centred around:

- differences in flight behaviour and recovery techniques for various types of aircraft
- discussion of the effects of varying weights, centre of gravity limits, control inputs or changes in power.

Of the respondents who disagreed (11%) the main theme was that pilots should be trained to recover from a spin at the incipient stage or beyond and that the proposal to reduce the extent of training would result in further accidents due to the inability to recover from a spin, or the lack of awareness of what they were being trained to avoid.

### CASA's response

Editorial and technical additions suggested by respondents will be incorporated where possible in the AC when published. A marked-up version of the AC showing the edits will be provided with this summary of consultation.

The additional detail requested in some respondent comments, such as type specific information, lies beyond the scope of the AC to provide. Descriptions specific to aircraft type are available in aircraft flight manuals, pilot handling notes, textbooks or the publications referenced in the AC.

Several respondents observed that the implementation of the proposal would require changes to the Part 61 MOS, Flight Instructor Manual (Aeroplane), Flight Examiner Handbook and test forms. This is acknowledged and CASA will consult on these changes shortly.

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. This concern is not supported by the experience of authorities which have adopted the spin avoidance model, where fatalities as a result of spin have not increased, and risks involved in advanced stall training have been reduced. This will be further discussed in the analysis of each of the question responses where it is raised. CASA's view, as proposed in the AC, draws from international experience and ICAO guidance. They affirm that:



- greater benefit can be gained from teaching spin avoidance rather than spin recovery, and
- greater focus must be provided to slow flight and the situations that lead to stall, and stall recovery up to, and including, the wing drop.

**Question 2 - Will training in the recovery from wing drop at the stall proposed in this AC enable a pilot to safely avoid a spin?**

Of the 73% of respondents who supported the proposal; 44% agreed, and 29% agreed, but with changes.

Forty (40) respondents provided comment to this question.

Most agreed that the AC delivered the desired safety outcome of spin avoidance and would provide economic and practical benefits.

"Spin avoidance is far more preferable from the perspectives of safety, airframe cost, student retention and training times."

A recurring comment, regardless of those who agreed or disagreed, was trainee pilots should experience a spin in order to know what they are avoiding, and to observe the technique for recovery. Typical of this point of view was:

"...many spins leading to death take place in turns (onto final etc) and this is not proposed for training. The student (and all pilots) needs to experience and develop a natural instinct in such conditions".

"Spins are a fact of life and all pilots should be trained in recovery from spins intentional or otherwise"

**CASA's response**

As will be discussed at question 5, increased training effort in slow flight, stall recognition and recovery (spin avoidance) offers greater benefit than spin recovery training.

CASA encourages exposure to spinning and spin recovery with a qualified instructor to round out a pilot's awareness, however, it is not a training requirement for any pilot licence. Also encouraged are spinning and aerobatics training leading to the grant of a flight activity endorsement.

Several respondents were surprised that training aircraft are not necessarily certified for intentional spinning or that they do not perform consistently when spun.

"GA and RAAUS aircraft that do not have a standard spin recovery should not have been certified in the first place. Aircraft used for training in particular should be cleared for fully developed spins."

As the draft AC describes, aircraft are designed and built to a number of certification standards which may be met in a variety of ways. Each aircraft will perform differently in many aspects of flight, including spinning. Some aircraft are suitable for particular kinds of training and not for others. For this reason, it is important to be familiar with the limitations contained in the flight manual of each aircraft flown. The operator and head of operations (HOO) are responsible for selecting aircraft and personnel appropriate for the task.

### **Question 3 - Will the advice provided in the AC enable a flight instructor to improve the way in which they teach spin avoidance?**

Seventy-two percent (72%) of respondents supported this aspect with 53% agreeing and 19% agreeing but with changes, 19% disagreed.

Thirty-one (31) respondents provided comments to this question.

#### **CASA's response**

Of the respondents who agreed, but with changes, most provided technical editorial advice that was too specific to types of aircraft to be within the scope of the AC.

There were several comments regarding use of aileron at the stall and departure from stalled flight which will be expanded on in the published AC.

"RAAus agrees this advice, if adopted, will ensure Instructors are clear about what the exercise is intended to achieve and alert Instructors to the differences in aircraft certification requirements and therefore potential aircraft responses in relation to spin avoidance versus spin training.

However, RAAus believes further ongoing education is required regarding the candidate understanding of the use of aileron as an instinctive response to a wing drops (thereby de-coupling roll recognition (wing drop) by pilots use of aileron at this time). The correct use of rudder as the primary control to arrest both the initial wing drop and further developed yaw with immediate removal of any roll input is essential to improvement in recovery from these upset scenarios."

Many respondents provided recommendations regarding the priority and order of training to best establish spin avoidance competency.

"Recommend in s10.2 the order of stall recovery training and spin avoidance be included for the information of instructors. eg. 1. Demonstrate Slow Speed Flight, 2. Demonstrate characteristics of a stall, 3. Correct stall recovery technique, 4. Recovery from a Straight and level stall without wing drop, 5. Recovery from a straight and level stall with a wing drop, 6. Recovery from a stall with and without a wing drop in the following configurations etc."

The order and nature of this training is defined by the flight training operator to achieve the final standards in the Part 61 MOS. Consequential amendments to the Part 61 MOS as a result of this AC consultation will be consulted shortly.

Of the 19% of respondents who disagreed, comments reiterated the previous theme of a student pilot experiencing a spin to at least know what they are avoiding, and how to recover.

"I think a student needs to experience a spin ...so that;

- 1) They know what they are trying to avoid
- 2) If they do mishandle a recovery from a stall or other event leading to an incipient spin, or progressing to a full spin they are not completely in the dark"

The avoidance of use of the rudder at the stall to induce a wing drop is pretty poor. Putting the onus on HOOs/CFIs to come up with "combinations" is not going to make much sense in the overall need for standardised training methods.

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

**Question 4 - Is the instruction in spin avoidance in the proposed AC sufficient to ensure competence in this area, when qualifying for a pilot's licence?**

Sixty-four percent (64%) of respondents provided support for this aspect of the AC (45% agreed and 19% agreed but with changes). 25% disagreed.

Thirty-three (33) respondents provided comments to this question.

All respondents recognised the need for correct handling in all phases of flight consistent with the AC proposal and its rationale:

"Most aircraft have to be flown well outside the normal envelope before a spin can fully develop. (To my knowledge). However, a stall/loss of control close to the ground accident I imagine is much more common. This comes back to correct aircraft handling for the phase of flight being conducted and all the associated training/skill set"

Respondents who agreed, and also those who disagreed, expressed that spin should, at least, be demonstrated:

"Should at least be demonstrated a Spin."

"Whilst avoidance is paramount recovery through honing skills and experiencing the sensation of spins will help take the panic out of an unfortunate error. Again it depends on the flight school and the instructors ability."

"Upset Prevention and Recovery Training is appropriate per ICAO: "all airplane operators, pilot schools, and training centers are encouraged to implement UPRT and to use this guidance, as applicable to the type of airplane in which training is conducted. Consider basic UPRT for all licences and advanced UPRT for ATPL per EASA requirements and ICAO recommendations."

"I would prefer all students be required to demonstrate full spin entry and recovery. There are too many pilots (especially many going straight into airlines) who are not competent in unusual attitudes, indeed many are scared out of mental self-control by such events. The PPL/CPL syllabus does not address this. As a very minimum the student pilot should experience and recognise a spin even if just a demonstration."

"A pilot and aircraft should be able to recover after a minimum of three spins."

"Spin avoidance and spin recovery are very different and must be trained as such"

Comment was also made regarding the experience and training level of instructors.

"Instructors need specific training in recognising and reacting to students counter intuitive actions and gain better familiarisation with specific aircraft types prior to instructing in these sequences and as mentioned with reference to POH handling instructions"

"If the Instructor is not competent at full spin recovery how is the student going to recognize when a spin is imminent and thus avoid it."

The AC describes the importance of operating with reference to flight manual and pilot operating

handbook limitations, and the responsibility of HOOs to ensure the safe delivery of training through use of suitable aircraft and adequately trained and qualified instructors.

## Provisions that received mixed support

Notwithstanding broad support for the proposed AC, many respondents felt that spinning and recovery should be at least trained and tested for the grant of a licence.

### Question 5 - Do you think instruction in recovery from spins should be required training for the grant of a pilot's licence?

Fifty-two (52%) of respondents agreed (10 providing comments) and 13% partially agreed (10 providing comments), 29% disagreed (22 providing comments). It should be noted that 'agree' and 'agree with changes' responses to this question appear contrary to the proposal in the draft AC, while 'disagree' responses actually support the proposal. However, elements of 31 of the 42 comments, including 4 'agree' responses and 8 'agree, but with changes' responses reflected general support for the AC.

Most respondents who provided comment, irrespective of position on this question, expressed that pilots should experience a spin and recovery during training to be aware of what they were training to avoid.

Among the 'agree' responses were:

"It may offer a last line in defense and will provide the student with increased handling experience and confidence. Too many pilots at all levels, are flying computers these days with insufficient stick and rudder skills to rely on when forced to revert to first principles."

Spin training "should be done in an appropriate aircraft with appropriately qualified instructor. I've never been in a spin, but think if I somehow did, I would get such a fright my performance would be poor. If everyone had been in and recovered from a spin, it would help their recovery."

"I would say yes for a Commercial Pilots Licence or higher. This is where pilots go from just having fun themselves, perhaps with their mates, to accepting money for their flying skills, and having passengers relying on their flying skills - so I believe it is a good place to require the additional skills demonstrated by passing spin training."

"Recognition and recovery at the incipient stage should be a requirement."

"Spin avoidance should be a requirement for licenses."

"Instruction in spinning and recovery should remain a requirement for the Flight Activity Endorsement."

"I believe that when this was a requirement more people were dying in training than in real stall/spin accidents."

"Slow flight and stall recognition and recovery is more important."

"Most pilots won't be flying aircraft that are intentionally spin-able."

"I believe as a minimum spin recovery should be demonstrated by an instructor during training."

SUMMARY OF CONSULTATION ON  
SPIN AVOIDANCE AND STALL RECOVERY TRAINING

"Agreed, but practical hands on training limited to spin avoidance training stalls with wing drop, or simulation"

"At a minimum extensive ground briefing of spins and spin recovery techniques should be mandated."

"I would suggest recovery from a wing drop would be sufficient. Bearing in mind the majority of modern training aircraft (80's onward) are not certified for spinning."

It was visible in the comments of many among those who provided an 'agree' response (that instruction in recovery from spins should be required training for the grant of a pilot's licence) in fact supported the AC proposal. The common theme was that they wanted the experience of spinning, rather than spin recovery training, to be part of the course of training for some level of licence so that pilots know what they are avoiding.

Among those who disagreed, most supported the AC proposal and cited further reasons to move to the spin avoidance philosophy:

"It is more important to teach students to recognise the symptoms leading to the spin than recovering from a developed spin."

"Most training aircraft are not certified for spinning."

"If you mean a fully developed 3 turn spin then it is a nice to have for most licence holders, but a must have for instructors and aerobatic pilots."

"We as an industry do not have enough qualified and experienced instructors who can safely and correctly teach spinning. ...to make spin training part of license training, the industry will be putting inexperienced instructors into this critical phase of flight and we will see an increase in spin related training accidents "

Just as anti-lock brakes avoid the need to know how to control brake lock and skidding in a car, aircraft that use anti-spin technology are valid and potentially safer aircraft. To force these to be spinnable, or force students to change aircraft just for spin training, is unnecessary.

"The harsh reality for these accidents is the only way to prevent them, is to not get into a spin in the first place."

"With the increasing number of aircraft types that may not be able to recover from a spin, stall and spin avoidance is becoming increasingly important."

"Spin recovery techniques need to be practiced regularly in order to be used effectively when required, whereas stall and spin avoidance practice should be employed constantly during every flight a pilot takes."

"Many new aircraft are not approved for spinning. As an industry we want to encourage operators to invest in new aircraft, therefore the requirement for spin training is not appropriate for these aircraft."

"The only reason I disagree is because many newer models of aircraft don't recover from spins. Teach the student to counter it, to fight all way to ground if needed, but more emphasis needs to be placed on not even getting into that position."

## CASA's response

Repeated analysis of spin incidents shows that fatalities are attributed primarily to spin being entered at altitudes from which a recovery could not be made, even when the pilot possessed the skills to recognise and recover from a spin. Worldwide experience has shown that there is not a net benefit in requiring spin recovery to be taught, and that more effort should be spent training recognition of slow flight and the symptoms of a stall with a view to spin prevention, or of recovery before a spin eventuates.

There is a limited and reducing number of aircraft certified for intentional spinning. There is also a small number of instructors with spinning training endorsements which challenges the industry's capability to deliver this training if mandated.

### **Question 6 - Do you think testing a pilot's ability to recover from spins should be a required component of pilot licence flight tests?**

Forty-one (41%) agreed, 11% agreed but with changes, 43% disagreed (supported the AC proposal). As above, 'agree' and 'agree with changes' responses to this question appear counter to the proposal in the draft AC while 'disagree' responses support the proposal. However, most comments reflected general support for the AC.

The two 'agree' respondents who added comments felt strongly that spin testing was essential.

"With spin related LOC accidents still accounting for approximately one quarter of accidents worldwide I think the answer to this question is obvious based on the data."

Of the 7 'agree with changes' responses, comments generally recognised the absence of intentional spin certified aircraft, that the cost and availability of an aircraft that could satisfy spinning and all other test requirements such as speed for navigation exercise, may render the suggested requirement impractical.

"Only by a qualified instructor with experience on a spin certified aircraft other than that demonstrate recovery from a wing drop should [suffice]"

"I was fortunate to receive training in both entering a stall and actually spinning in a certified aerobatic aircraft and so got used to the sensations as well as fully understanding the application of controls for recovery from a fully developed spin, rather than only having the "theoretical" knowledge. However, as many trainers are now not certified to the level of spinning/aerobatics, this state of flight becomes more difficult to provide the practical experience. In the absence of this practical experience, then the UPRT approach appears to be all that is left in a practical sense - other than more intensive training and drill in this regard, to replace the experience of spin recovery."

"Agree, but it should never be conducted as a part of a test, but as a part of the training, and endorsed only by the instructors-to-pilot..."

Of the 43% of respondents who disagreed, 33 added comments consistent with support for the draft AC:

"I would be surprised if there was more than a dozen Flight Examiners who would be comfortable spinning given their recent experience."

"Show competence in managing airspeed and AOA."

SUMMARY OF CONSULTATION ON  
SPIN AVOIDANCE AND STALL RECOVERY TRAINING

"Not part of a flight test necessarily (as it would just add another test due to the requirement to perform it in a suitable aircraft) but part it should be in the Syllabus and covered during course work and documented as such."

"Aircraft used for flight tests may not (be) operated in the appropriate category for fully developed spins; flight bags etc will usually be on the back seat to allow access by the pilot which is not permitted for spinning. Also, flight test officers may not be Spinning pilots or spinning instructors."

"The availability of suitable spin aircraft with appropriate straight-line performance for navigation is limited. It should be tested as part of the flight activity endorsement. For PPL and CPL the flight exam is often combined with a design feature endorsement, ie retractable and/or MPPC. These aircraft are not usually permitted to spin."

"If the normal training is correct and sufficient then a pilot should be able to recognise and recover before a spin is entered into. It would also be an added cost and logistic burden to conduct separate spin exercises in aerobatic aircraft. Spin activity endorsements should remain related to more advanced ratings."

"I would not like to see it required for any flight test other than for a flight instructor rating."

"Most pilots won't be flying aircraft that are intentionally spin-able."

"Slow flight and stall recognition and recovery is more important."

"Most PPL and CPL flight tests are conducted in aircraft that are not approved for spinning. Instructor rating candidates should be taught spin recovery as a minimum and probably should be assessed again at each proficiency check."

"Spin entry and recovery is an important but only a minor part of pilot licence training. There should be a requirement for formal training and certification which can be "ticked off" by the Flight Test Examiner in much the same way mandatory spin training is included in the Flight Instructor Rating training syllabus"

"Recognition of impending situation leading to stall/ spin should be tested"

"The minimum requirement being advocated is for the pilot to have had the experience certified in their log book"

"Risk not justified"

### **CASA's response**

As in question 5 above, worldwide data suggests that the capability to recover from a spin would not have saved the majority of pilots in fatal spin accidents as they occurred too low to effect a recovery. Greater benefit will be derived from training with emphasis on the characteristics and risks of slow flight and familiarity with aircraft control in flight regimes which typically lead to the stall.

**Question 7 - Should flight training organisations be required to conduct all training for the grant of Recreational, Private and Commercial Pilot Licences, in aircraft certified for intentional spinning?**

Twenty-four percent (24%) agreed, 16% agreed, but with changes, 54% disagreed.

As above, 'agree' and 'agree with changes' responses to this question appear contrary to the proposal in the draft AC while "disagree" responses support the proposal. However, comments from most respondents reflected general support for the AC.

Comments from the 24% of respondents who agreed centred around overall safety, whether the proposed changes are implemented:

"Requiring spin certified aircraft may seem like a contradiction to not requiring spin instruction however there are two advantages to doing so:

(1) It improves the safety of conducting spin avoidance training, i.e. an inadvertent spin would be recoverable

(2) It ensures that the highly recommended spin recovery training is available unless the student specifically does not want to do it."

"Definitely; or at least (for) the spinning component of the training"

"As stall recovery and spin avoidance training if incorrectly handled may lead to a spin."

Seventy-eight percent (78%) of respondents who agreed that spin should be tested for licensing (question 6) also agreed that flight training organisations should be required to conduct all training for the grant of Recreational, Private and Commercial Pilot Licences, in aircraft certified for intentional spinning (question 7).

Comments among the 16% who agreed, but with changes, were similar; differentiating the type of training to be conducted in aircraft certified for intentional spinning rather than requiring all training in such aircraft.

"As written that's just silly. But for ab initio basic training perhaps yes until basic flying skills are established and the pilot has gained confidence. Navigation exercises etc can be in more suitable aircraft that are not necessarily certified for spinning. A return during later training to a suitable aircraft to revise, and perhaps be introduced to more advanced recovery from unusual attitudes, would make sense. ...However, I accept that suitable aircraft may not be available in all circumstances to conduct intentional spin training."

"Yes, as far as a Recreational Private Lic is concerned."

"Any element that may include stalls should be done in an aircraft certified for intentional spinning."

"The actual spin test conducted in a spin capable aircraft. Training in spin should also be conducted in a spin approved aircraft."

"Yes, but only when the spin recovery is to be demonstrated. I.e. in that particular training session. Otherwise, no."

In selecting the disagree response (54%) most respondents recognised that at present the national training fleet contains aircraft in the normal category which are not certified for



intentional spinning.

"Only flight training that is spinning specific needs to be conducted in aircraft certified for intentional spinning."

"Not required if spin recovery training is not included. Only should be required for training involving spin recovery."

"Spin training is an element of emergency training; it is only part of total. There is no justification for all training to be done in aeroplanes suitable for spin training."

"There is no reason why the components of RPL, PPL and CPL, not involving spin stall recovery training would need to be conducted in an aircraft that is certified for spinning. Only the training associated with spin stall recovery would need to be conducted in an aircraft that is certified for spinning"

"I believe all RPL training should be conducted in aircraft that are approved for spinning. As this is the time to build good skill sets and the students are more likely to react incorrectly to the approaching stall spin conditions. RPL training tends to be done by less experienced instructors who may also be slower to recognize and react appropriately and should fly aircraft that are unable to become unrecoverable due to incorrect or late initial recovery techniques. However, as aircraft become faster and more complex it becomes more difficult to find a spin certified aircraft. ie a Multi engine CPL would be unable to fly a Spin Aircraft."

"Most new aircraft are not approved for spinning."

"This would mean that most flying schools would have to either change their entire fleet or close their doors. There would need to be a very convincing safety benefit to justify grounding thousands of training aircraft types that have been training pilots safely since the 1960s and putting Australia out of step with other ICAO countries."

"This would be a major disadvantage for the operators who solely utilising modern aircraft which are not certified for intentional spinning however equipped with modern safety features such as spin prevention and ballistic parachutes. Pilots choose to train in these aircraft because of the safety features and other luxuries it offers and they are highly unlikely to move on to any other single engine piston aircraft. Restricting training to intentional spin certified aircraft would be a disadvantage and an inconvenience for the trainees as well."

Some felt the certification standards of light sport aircraft fell short of the standards required to safely conduct stall and spin training:

"...LSA aircraft are not suitable for CPL training and flight testing as they are not representative of a typical first job aircraft, as well as having questionable stall/spin characteristics."

"If required competencies only extend to stall with a wing drop per this draft AC then FAR 23 certification standards provide adequate safety margins. Other certification standards may not be appropriate..."

Many recognised the cost implications of having spin-certified aircraft in a training fleet:

"No, because a lot of schools organisations do not have aircraft approved for spinning. Only a small percentage of training types are approved for spinning."

"There has been too much investment in these aircraft to date and it would be a heavy financial burden on operators to enforce the use of spin approved aircraft for training."

"Due to integration into the national training industry fleet of aircraft that are not permitted to spin, such as DA40 and SR20/22, it is impractical to require all flight training for the grant of a licence to be conducted in aircraft certified for intentional spinning."

It is simply not economically or physically possible, as GA flying training organisations already suffer financially ...to add the expense of additional / different aircraft would be industry crushing. Economics aside I don't recall any RAA registered aircraft having this ability. We would all be potentially safer if a CPL or ATPL held an aerobatic rating or advanced spinning (flight activity endorsement).

In addition, some respondents were concerned with instructor expertise, experience and capability:

"Too cost prohibitive for the industry. The problem isn't the aircraft, it is the instructors."

"Simply, cost! Fully developed spins should not be required. Instructors should be more strenuously tested on their ability to teach proper avoidance and incipient recovery techniques, particularly coordinated flight."

### **CASA's response**

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

However, commercial pilot licence training requires the use of aircraft which can cruise at higher speeds than initial training aircraft and are usually fitted with retractable undercarriage and a constant speed propeller. Few of these aircraft types have ever been certified for intentional spinning.

Mandating aircraft certified for intentional spinning for licence training would compromise choice of aircraft for flight training organisations and increase the overall cost of training aircraft if those capabilities were required in one aircraft. Organisations which presently have no aircraft capable of intentional spinning would be at an immediate operational and business disadvantage and would have disproportionate fleet replacement and renewal costs.

### **Free text responses to the AC**

Thirty-nine (39) respondents provided comments in the free text field provided at the end of the survey.

There was a significant volume of feedback to analyse. Many technical and editorial suggestions were made which will be adopted in the released publication, in particular; consistency with language and concepts described in documents which have come before it, and advice regarding the scenario-based training to best support spin avoidance training.

All other points made in the additional comments echoed those made in the comments following each question and have been addressed above.

## Summary and next steps

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

There was broad agreement that the AC achieves the purpose of making accessible information regarding stalling, wing drop, spinning and aircraft certification and linking them with training practices and choice of aircraft for aspects of flight training.

Based on community 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 spin avoidance and the recovery from a stall with a wing drop.

CASA will undertake the following activities:

- The AC will be edited and, when published, will include further information on scenario-based training and the execution of slow flight and stalling exercises.
- Consultation will be conducted regarding amendment of the Part 61 MOS to replace reference to the 'incipient spin manoeuvre' recovery from wing drop at the stall'. This will make it consistent with the proposal that formed the basis of this consultation.
- 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.

CASA anticipates that consultation on the proposed changes to the Part 61 MOS will occur in late March through to early April, 2020.

The proposed changes will commence in the second quarter 2020.