Australian Government
Civil Aviation Safety Authority

SUMMARY OF PROPOSED CHANGE

Proposed amendments to Part 172 MOS - Air traffic control vectoring procedures

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Introduction

CASA proposes a small change to the air traffic control (ATC) rules for vectoring aircraft to intercept the final approach course or track for an instrument approach procedure. In effect, we are proposing to continue the ATC vectoring procedures that applied immediately before we adopted amended International Civil Aviation Organization (ICAO) rules in late 2019.

The current ICAO-based rules require ATC to ensure aircraft are in level flight for 1 nautical mile (NM) before intercepting the localiser or lateral course for final approach and then in level flight for 2 NM before intercepting the glide path or vertical path to the runway.

Our proposal is that ATC would not be required to apply fixed distance level flight segments but instead would arrange descent so that an aircraft has opportunity to level off to dissipate speed - if this is necessary. The proposed change would be implemented by amending the Part 172 Manual of Standards (MOS).

Contents

Acknowledgement of Country

The Civil Aviation Safety Authority (CASA) respectfully acknowledges the Traditional Custodians of the lands on which our offices are located and their continuing connection to land, water and community, and pays respect to Elders past, present and emerging.

Artwork: James Baban.

Reference material

Acronyms

The acronyms and abbreviations used in this SPC are listed in the table below.

Table 1: Acronyms

Acronym	Description
AC	advisory circular
APV	approach procedure with vertical guidance
CASA	Civil Aviation Safety Authority
CDO	constant descent operation
GLS	ground-based augmentation system landing system
ICAO	International Civil Aviation Organization
MOS	Manual of Standards
NM	nautical mile(s)
PRM	precision runway monitor
RNP APCH AR	required navigation performance approach – authorisation required
SPC	summary of proposed change

Definitions

Terms that have specific meaning within this SPC are defined in the table below. Where definitions from the civil aviation legislation have been reproduced for ease of reference, these are identified by 'grey shading'. Should there be a discrepancy between a definition given in this SPC and the civil aviation legislation, the definition in the legislation prevails.

Table 1. Definitions

Table 2: Definitions

Term	Definition
continuous descent operation	An operation, enabled by airspace design, procedure design and ATC, in which an arriving aircraft descends continuously, to the greatest possible extent, by employing minimum engine thrust, ideally in a low drag configuration, prior to the final approach fix/final approach point. (ICAO)
vectoring	Provision of navigational guidance to aircraft in the form of specific headings, based on the use of an ATS surveillance system. (ICAO)

References

Legislation

Legislation is available on the Federal Register of Legislation website https://www.legislation.gov.au/

Table 3: Legislation references

Document	Title
Part 172 of the Civil Aviation Safety Regulations 1998	Air Traffic Service Providers
Part 172 Manual of Standards	Air Traffic Services

International Civil Aviation Organization documents

International Civil Aviation Organization (ICAO) documents are available for purchase from http://store1.icao.int/

Many ICAO documents are also available for reading, but not purchase or downloading, from the ICAO eLibrary (https://elibrary.icao.int/home).

Table 4: ICAO references

Document	Title
Doc. 4444	Procedures for Air Navigation Services — Air Traffic Management (PANS-ATM)

Purpose and scope of the proposed amendments

In mid-2019, we amended the Part 172 Manual of Standards (MOS) to replace the original Australian rules for ATC vectoring during close-spaced instrument approach operations with equivalent International Civil Aviation Organization (ICAO) rules.

This amendment was part of a broader change with the Part 172 MOS addressing an industry request to enable ground-based augmentation system landing system (GLS) for final approach guidance in certain conditions. The original Australian rules only allowed instrument landing system (ILS); whereas the new ICAO rules also allowed GLS as well as required navigation performance approach – authorisation required (RNP APCH AR) and approach procedure with vertical guidance (APV).

A consequential effect of the ICAO rules was a new requirement for ATC to arrange two level flight segments when vectoring an aircraft – a 1-NM segment for an aircraft's flight path immediately before its intercept point with the final approach path; and a 2-NM segment between that intercept point and the point at which the aircraft intercepts the vertical flight path (glide path).

The original MOS rules specified a 1-NM segment in straight flight before localiser intercept, but did not require any specific distance in level flight. Instead, ATC needed to issue descent to the commencement altitude for the instrument approach procedure soon enough to enable the aircraft to level off to reduce excess speed. This procedure meant that ATC clearances could provide a constant descent path, with the flight crew managing energy to comply with speed requirements. Any level off would only be, as necessary, for ATC separation or for situations where excess speed could not be adequately dissipated during descent.

There was a positive response to the consultation for the 2019 MOS amendment. However, one respondent said the level flight segments inhibited the use of continuous descent operations (CDO) – a procedure enabling an aircraft to descend continually from cruising level to landing. Despite this comment, being mindful of standardisation, we proceeded to implement the ICAO procedure in full.

The amended ICAO-based rules have not been operationalised in Australia. This is because the COVID-19 pandemic curtailed flight within Australia to the extent the affected instrument approach procedures were discontinued at the point the new ICAO-based rules were meant to be implemented.

With traffic levels returning to normal levels and Airservices Australia (AA) is now preparing to reintroduce those approach operations. AA informed CASA that the ICAO level flight requirements are incompatible with the airspace arrangements and traffic flow designs for Sydney (Kingsford Smith) aerodrome, particularly in the north and north-west. Implementing the level flight segments would either require extensive redesign of airspace and traffic flow arrangements or cause significant operating difficulties and inefficiencies. Accordingly, they asked CASA for relief from the 2 NM level flight segment.

In considering options for resolving the identified issue, we considered 3 options:

a. Option 1: Change the vectoring requirements but do so by re-continuing the original descent requirements as specified in the MOS until 2019 (i.e. going beyond removing the 2 NM level flight segment).

b. Option 2: Agree to the solution as requested, which would give relief from one of the two level flight requirements specified in ICAO Doc. 4444.

c. Option 3: Reject the request on the basis Australia is simply following the international rule and AA should arrange airspace changes to accommodate the ICAO rule.

CASA elected to proceed with Option 1 – re-continuing the original MOS vectoring requirement. We recalled that adopting the ICAO rule was primarily to facilitate more approach guidance options, and not because of a problem with the vectoring procedure or the original procedures on the whole. The original rules, in fact, were underpinned by a robust safety case and validated in 2 decades of operation, all within a supporting flight path and airspace configuration.

In support of Option 1, we also reflected on feedback about CDO during the 2019 consultation and now consider that this aspect should have been accounted for in the resulting rules. It is apparent the ICAO rules for vectoring are counterintuitive to CDO, which allows aircraft to descend smoothly and continuously at lower power settings from cruising altitude to the runway; therefore, reducing noise and improving fuel efficiency and environmental sustainability.

We are also aware ICAO has identified that the level flight distance requirement is problematic and that a change to those procedures is being contemplated. However, experience suggests any change to international rules will take at least 5 years, and we do not believe it would be appropriate to wait this long to address a current issue.

We rejected Option 2 as this would result in a hybrid rule - not conforming with ICAO or other international rules and not being consistent with the original safety case for approach operations at Sydney (Kingsford Smith) aerodrome. We also rejected Option 3 because changing the airspace and flight path arrangements to accommodate the ICAO procedure would be difficult to justify given the existing arrangements were originally fit for purpose for Sydney approach operations. Further, persisting with the ICAO rules without changing the existing flight path and airspace structure will add to ATC work complexity and cause delays and fuel burn inefficiencies whilst increasing aircraft noise. Both Options 2 and 3 would not support the principles of CDO.

Current and previous rules for vectoring

The particular ATC rules for vectoring are specified by cross-reference to section 6.7.3.2 in ICAO Doc. 4444. There are no equivalent rules specified in the Part 172 MOS.

Relevant to the proposed amendment, paragraph 6.7.3.2.4 of ICAO Doc. 4444 states:

> *When vectoring to intercept the final approach course or track, the final vector shall meet the following conditions:*
>
> *a) enable the aircraft to intercept at an angle not greater than 30 degrees;*
>
> *b) provide at least 1.9 km (1.0 NM) straight and level flight prior to the final approach course or track intercept; and*
>
> *c) enable the aircraft to be established on the final approach course or track, in level flight for at least 3.7 km (2.0 NM) prior to intercepting the glide path or vertical path for the selected instrument approach procedure.*

Cross-reference to a rule in ICAO Doc. 4444 is enabled by subregulation 172.075 (1) of the *Civil Aviation Safety Regulations 1998*, which states *'An ATS provider must ensure that any air traffic service that it provides is provided in accordance with the procedures and rules set out in ICAO Doc. 4444, as varied by Gen 1.7 of Part 1 of the AIP.'*

Previously, the equivalent rules were specified in section 10.4.2 of the Part 172 MOS. That section included the following:

> *10.4.2.1 …:*
>
> *(k) when vectoring an aircraft to intercept the ILS localiser course — the final vector:*
>
> *(i) enables the aircraft to intercept the ILS localizer course at an angle not greater than 30 degrees; and*
>
> *(ii) provides at least 1 NM straight flight prior to ILS localiser course intercept; and*
>
> *(l) the aircraft are cleared to descend to the appropriate glide path intercept altitude soon enough to provide a period of level flight to dissipate excess speed; and*

Key change proposal

We propose a small change to the Part 172 MOS that would:

a. rescind the application in Australia of paragraph 6.7.3.2.4 of ICAO Doc. 4444 (which specifies the vectoring and level flight segments requirement); and

b. as detailed in the attached consultation, re-introduce equivalent rules to those originally specified in subparagraphs 10.4.2.1 (k) and (l) of the Part 172 MOS.

The remaining rules in Section 6.7.3.2 of ICAO Doc. 4444 would remain in effect and unchanged.

Previous consultations

From 3 April 2019 to 1 May 2019, we consulted via CD 1903AS on replacing MOS rules with new ICAO rules.

In total, there were 6 respondents to that consultation, and all supported the proposal.

However, relevant to the current consultation, one respondent said the level flight requirement was not optimal or flexible, as flight crew ideally prefer a constant descent path, with energy managed to ensure compliance with any speed requirements etc. The respondent asserted that the existing MOS procedure is more flexible because it only requires a period of level flight as necessary to dissipate speed prior to G/S intercept required (in other words, only when requested by the flight crew).

We responded that it was our understanding both original and proposed ICAO rules required ATC to assign descent with enough time to allow aircraft to level off and dissipate speed if this is required and that neither required ATC to ensure the aircraft actually levels off. On reflection and in light of the airspace and flight path factors since revealed, we now consider that the respondent's comment was pertinent and - as is now the case - may have resulted in changes to the proposed 2019 rules.

Impact on industry

CASA has assessed that re-introducing the original vectoring rules will have little or no safety, operational or regulatory impact. This is because:

- The arrangement simply re-continues rules that were successfully in use for many years before the MOS was amended in 2019.
- The rules introduced in 2019 were never operationalised due to COVID-19, hence there is no procedure or practices to undo, and no resultant risk of confusion.
- Utilising the original vectoring procedures avoids the need to redesign the airspace and flight paths to accommodate the ICAO-based vectoring procedures.

Impact analysis

The proposed amendments will be submitted to the Office of Impact Analysis (OIA) for assessment. However CASA expects that the proposed amendments will have machinery impacts and that no further analysis in the form of an Impact Analysis (IA) will be required.

Submitting your view and what next

We would like to hear your views on the amendments we have presented. Please review the proposal and provide your feedback and any additional concerns not covered in this SPC.

Your feedback will make a valuable contribution to CASA's policy decision-making process and help to fully inform CASA of the perceived impacts (positive and negative) on the aviation community regarding the proposal.

CASA will consider all comments received as part of this consultation process and incorporate changes as appropriate. Comments on this consultation should be submitted through the online response (CASA Consultation Hub) form by close of business 4 April 2025.