



SUMMARY OF CONSULTATION

Changes to publishing standards and calculation of visibility minima

Manual of Standards Part 173 Amendment Instrument 2019

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Overview

In May 2019, CASA consulted on a proposal to amend the Part 173 Manual of Standards (MOS) to permanently include a longstanding temporary exemption arrangement relating to instrument flight procedure publishing standards, and to clarify the requirements for calculating visibility minima.

About this consultation

The consultation closed on the 2 June 2019 and there were 9 completed responses in total. A summary of the feedback is provided in this document.

The consultation sought feedback on the proposal to amend Chapter 8 and omit Chapter 9 of the Part 173 MOS as well as some consequential amendments. Other proposed changes to the Part 173 MOS included consolidating various definitions into a new 'Definitions' section and some minor editorial changes.

For many years CASA has granted exemptions from the publishing requirements in the Part 173 MOS to Part 173 certified designers. Formally documenting the requirements in the MOS will avoid the time and cost impacts of setting the same standards via exemption and the requirement of renewal from time to time. The proposed changes to the Part 173 MOS reflect the terms of the existing exemption which means that instrument flight procedure designers do not need to change existing business practices.

In an endeavour to explain the intended policy on calculation of visibility minima, CASA held discussions with instrument flight procedure designers and incorporated the outcomes of these discussions into the proposed changes. Overall, the proposed changes to the standards for calculating instrument approach visibility minima were positive. The proposed changes will:

- a. For aircraft operators:
 - i. with respect to differing minimum altitudes and differing lengths of approach lighting, enable approach procedures that show a more gradual and operationally accommodating range of runway visual range (RVR)/visibility values
 - ii. allow RVR/visibility credit for localiser and GNSS-based approach procedures.
- b. For approach procedure design organisations:
 - i. provide consolidated standards for RVR/visibility calculations thereby simplifying the task of accessing the relevant standards for these calculations
 - ii. eliminate misinterpretations that decision height minima must be upwards adjusted to account for a runway having no approach lighting or a short length approach lighting system.
- c. For aerodrome operators:
 - i. permit instrument approach procedures with closer coupling/alignment, between visibility minima and the existing and likely range of approach lighting systems. Closer coupling allows better minima and thus greater continuity of landing operations in all weather conditions.

Respondents

There were 9 respondents in total, 6 of which consented to having their comments published and 3 requested their submissions be confidential. Respondents included 1 airline, 4 aerodrome operators, 1 aerodrome consultant and 3 Part 173 certified procedure design organisations.

Respondents generally appear to be in favour of all proposed changes, with some additional comments proposing further change and requesting provision of additional information and requirements.

Key feedback

Proposal no. 1 – Amend publishing standards in section 8.9 of the Part 173 MOS

- 6 respondents were undecided and selected the option 'Undecided / Not my area of expertise', with no additional comments provided.
- 2 respondents annotated their response to 'Agree with changes', with no comments provided.
- 1 respondent disagreed with the proposed changes and annotated their response to 'Disagree', with several comments provided.

Section 8.9 of the Part 173 MOS sets the publishing standards for instrument flight procedure designs. Currently all Part 173 certified designers are exempt from complying with these requirements under CASA Instrument EX134/17.

The standards in the Part 173 MOS reflected original publishing standards used at the time of the initial release of the MOS in 2003. Since then there have been changes to the regulatory arrangements for the publication of aeronautical data, such as instrument flight procedure charts and, more significantly, the introduction of Part 175 of *Civil Aviation Safety Regulations (CASR)*—Aeronautical Information Management in 2014. CASR Part 175 introduced standards for aeronautical information management, including the use of a Data Product Specification (DPS) to set the publishing standards for the Integrated Aeronautical Information Package (IAIP). All aeronautical information, including all instrument flight procedure charts published in the Australian Aeronautical Information Publication (AIP) and the Departure and Approach Procedures (DAP) handbook, must now comply with a DPS. Until recently, it has not been possible to amend the MOS to reflect the changed situation. Instead, CASA granted exemptions from the requirements. The terms of these exemptions reflect the existing and ongoing DPS arrangements according to CASR Part 175.

The only respondent that disagreed with proposal no. 1 disagrees with the changes to paragraphs 8.9.1.1 and 8.9.1.2 of the Part 173 MOS, in particular the introduction of the word 'must'. The changes to these paragraphs of the Part 173 MOS are:

8.9.1 - Procedures to be prepared in accordance with data product specifications.

8.9.1.1 A certified designer must comply with format and drafting conventions specified in a data product specification given to the certified designer under regulation 175.160 of CASR.

8.9.1.2 A certified designer must ensure that its operations manual includes a description of the processes and documents used to present the standards, rules and procedures mentioned in the data product specification.

The respondent believes such a change is more stringent than existing arrangements and instead proposes 'should' be used instead of 'must'.

There is a direct link between the publication requirements under CASR Part 175.160 (DPS and Publication Standards) and the proposed changes for the Part 173 MOS, and it is evident that complying with an Aeronautical Information Service (AIS) issued DPS is a regulatory requirement under CASR Part 175. Therefore, use of the term 'must comply' and 'must ensure' in the proposed changes to the Part 173 MOS ensures that a Part 173 certified designer fulfils their regulatory obligations required by the CASR.

Proposal no. 2 – Amend the standards in subsection 8.1.6 for calculating visibility minima, and omit Chapter 9 of the Part 173 MOS

- 5 respondents were undecided and selected the option 'Undecided / Not my area of expertise', with no additional comments provided.
- 2 respondents annotated their response to 'Agree with changes', with no comments provided.
- 2 respondents annotated their response to 'Agree with changes', with further comments provided.

There has been an ongoing issue with the standards for determining visibility minima in section 8.1 of the Part 173 MOS. Due to the formatting of the requirements, the standards have sometimes been interpreted as requiring instrument flight procedure designers to adjust an approach vertical minimum to account for the visibility minima. However, the intended policy is that visibility minima must be adjusted taking into account the vertical minima, and not vice versa. Further, the calculation standards set out in section 8.1 of the Part 173 MOS are restrictive when compared to international standards for allowing an operational benefit (reduced visibility minima) for runways equipped with approach lighting systems that are shorter than the standard 900 m in length.

To address these issues, CASA proposes to consolidate paragraphs 8.1.6.1, 8.1.6.2 and subsection 9.1.1 of the Part 173 MOS into a single section. The new section will have standards that require visibility minima calculations to be based on runway alignment and length of approach lighting (if any) provided for the runway.

The following comment was made in relation to the High Intensity Runway Lighting (HIRL) :

The requirement for a minimum visibility of 1200m for HIRL 'out' (High Intensity Runway Lighting) or runways without HIRL used to be included in Table 8-1 Minimum Visibility. Is HIRL removal an oversight or will the AIP be considered the source? It remains unclear how the "ALS out" situation and varying approach lighting lengths will be managed.

HIRL is not a component of the criteria to calculate or determine the approach visibility. The more important factor for the calculation of the approach visibility in the existing Table 8.1 criteria, is the length of approach lighting system in metres or zero metres for a runway with no approach lighting system of the type of high intensity Approach Lighting System (ALS) in

operation. This may be a Full ALS (ALS with a Category I, or Category II and III, lighting system that is at least 720 m long), an Intermediate ALS (ALS that is at least 420 m and less than 720 m long), a Basic ALS (ALS that is at least 210 m and less than 420 m long) or a No ALS (the runway has no approach lighting system or has an ALS that is less than 210 m long). HIRL is therefore not a factor in the determination of the approach visibility calculation and was deliberately removed.

The following comment was made in relation to the table referencing in the Part 173 MOS:

8.1.6.1B The requirement to publish the larger of the calculated or the tabulated value will have a negative impact on some published approach procedures where visibility minima calculated in accordance with the current MOS 173, Chapter 9. (E.g. Sydney ILS and GLS RWY 34R approach). We suggest the Table in this paragraph should be given a number and referenced by that number, the same as other Tables in MOS.

CASA investigated the matter and could not establish what the negative impact would be. However, CASA agrees to add a table reference and number to the new table in the Part 173 MOS, this will be done during the final editing process.

The following comment was made in relation to the units of measurement used:

8.1.6.1C The current formula in MOS Chapter 9 states the units of measurement used (m). The new formula does not explicitly state that feet are supposed to be used for MDH or DH, creating a potential for confusion.

The proposed formula already contains the necessary conversion factor required to convert minimum decision height (MDH) or decision height (DH) (published in feet) into meters (m). Therefore, no amendment is required to the proposed change.

The following comment was made in relation to calculated visibility for higher aerodrome elevations:

8.1.6.3 The table is only valid for an aerodrome at sea level. This should be stated, and a provision made for the calculated visibility to be used in case of higher aerodrome elevations.

CASA's response to the comment above is that the values as published in Table 8-2 are based on existing ICAO PANS-OPS criteria and methodologies used to determine circling visibility values. From a procedure design perspective, there is no issue in using the existing values as per Table 8-2 of Part 173 MOS, as these numbers are derived from the recommendations in ICAO PANS-OPS Doc 8168.

To provide additional guidance as to the origin of the figures in Table 8-2 and how these are calculated, the circling visibility calculation table will be retained at the end of the existing paragraph 9.1.2.1. This table will also be inserted as follows at the end of the note (Figure 1 below), in paragraph 8.1.6.3 of the Part 173 MOS:

[13] Paragraph 8.1.6.3, after the Table

Insert

Note: The values in Table 8-2 have been determined allowing for an omni-directional wind of 25 knots, an achieved bank angle of 25°, an OAT of ISA + 15, an altitude of aerodrome elevation plus 1 000 ft and the average visual manoeuvring speed for the aircraft category. Subject to an absolute minimum value of 2 km, the values were derived using the following formula:

$V = 0.9D$

Where V = circling visibility

D = diameter of turn at the average manoeuvring speed for category

0.9 = minimum downwind spacing, in nautical miles, to achieve alignment on final approach.

The circling visibility recognises that the pilot must be able to see the runway from the downwind position.

Figure 1: Proposed note in paragraph 8.1.6.3 of the Part 173 MOS

CIRCLING VISIBILITY

Category	A	B	C	D
IAS (kt)	90.00	125.00	170.00	195.00
TAS (1000ft, ISA + 15)	93.70	130.14	176.99	203.01
r (km)	0.51	0.98	1.81	2.38
E(km)	0.21	0.29	0.39	0.45
D=2r +2E	1.43	2.54	4.41	5.67
0.9D	1.29	2.29	3.97	5.11
Min. Circling Visibility	2.00	2.40	4.00	5.00

Figure 2: Circling Visibility table

The following comment was made in relation to maximum visibility values:

There is nothing mentioned regarding maximum visibility values. What to do in the case that the calculated visibility value is > 5 km. Logically the published visibility will be 5 km, but the criteria does not state this.

CASA agrees with the comment made by the respondent and therefore proposes to publish a maximum visibility value of 5km. CASA reviewed other international standards that allow an offset instrument flight procedure a reduction in the visibility criteria for straight-in non-precision approaches (NPAs) and approaches with vertical guidance (APVs). Based on the results of the review of other international standards and flight trials conducted by CASA, the following amended definition for ‘straight-in approach procedure closely aligned with runway centreline’ now allows offset NPAs and APVs to also qualify for lesser visibilities:

8.1.6.1 straight-in approach procedure closely aligned with runway centreline means a straight in approach procedure that:

- (a) utilises precision approach (ILS or GLS), ILS localiser, GNSS, VOR, VOR/DME, NDB and NDB/DME guidance for the final approach segment, and

(b) to qualify for lesser visibilities the final approach track is offset by not more than 10 degrees for Cat A and B aeroplanes or by not more than 5 degrees for Cat C and D aeroplanes.

A comment was made that all paragraph 8.1.6.1 A (a), (b) and (c) straight-in approaches were subject to PANS-OPS Vol II and Doc 9905 criteria. Paragraph 8.1.6.1 A (c) was amended to split sub-paragraph (c) below:

8.1.6.1 A Application of procedures for determining visibility for straight-in approaches (other than Category II, Category III and Special Authorisation Category approaches). The procedures for determining visibility in paragraphs 8.1.6.1B and 8.1.6.1C apply to the following runway approach procedures when conducted as a straight-in approach:

- (a) precision approach procedures with a DH of not less than 200 ft;
- (b) approach procedures with vertical guidance;
- (c) non-precision approach procedures.

that meet the ICAO PANS-OPS Vol II and ICAO Doc 9905 requirements for a straight-in approach procedure.

A comment was made in relation to the provision/calculation of visibilities when straight-in minima is not possible and only circling minima is published. The request to amend this part of the existing Part 173 MOS criteria is outside the scope of this Project (CD 1904AS), however this comment will be reviewed under the MOS 173 PIR Project (Project AS 04/02).

Proposal no. 3 – Dictionary, consequential and editorial amendments

- 5 respondents were undecided and selected the option 'Undecided / Not my area of expertise', with no additional comments provided.
- 1 respondent selected the option 'Not Answered', with no additional comments provided.
- 3 respondents annotated their response to 'Agree with changes', with no comments provided.

The proposed changes to section 8.9 of the Part 173 MOS required CASA to make consequential amendments to paragraphs 2.1.1.1 (r), 6.1.2.3 and 6.1.3.1 (b) of the Part 173 MOS.

CASA considers the overall response to the proposed change acceptable.

Future direction

Overall, respondents have strongly supported the proposals. CASA will now undertake to implement the changes in the Part 173 MOS. CASA is also currently undertaking a complete PIR of the Part 173 MOS (Project AS 04/02 - CASR PART 173 - Review of CASR Part 173 Manual of Standards (MOS)—Instrument Flight Procedure Design) and will further update the existing Part 173 MOS as a result of discussions with industry.

Published Responses

Where consent has been given to publish a response, the submitted responses can be viewed on the CASA [website](#).