Australian Government
Civil Aviation Safety Authority

CAAP 178-1(1)

Civil Aviation Advisory Publication
October 2004

Non-Precision Approaches

This publication is advisory only. It consolidates information on the relevant regulatory requirements relating to the subject for ease of reference. It is intended to aid in the understanding of and compliance with regulatory requirements.

Always read this advice in conjunction with the appropriate regulations.

Contents...

References

- AIP Australia
- Regulation 178 of the *Civil Aviation Regulations 1988* (CAR)
- CASR Part 173 Instrument Flight Procedure Design
- CASR Part 139 Aerodromes
- ICAO Procedures for Air Navigation — Air Operations DOC 8168-OPS/611 Volume 1 – Flight Procedures
- ICAO Procedures for Air Navigation — Air Operations DOC 8168-OPS/611 Volume II – Construction of Visual and Instrument Flight Procedures
- CAAP 89P–1 Non-precision approach runways – Aerodrome standards considerations
- CAAP 179A – 1 Guidelines for Navigation using GNSS

Who this CAAP is intended to assist

- Pilots and operators of aircraft using non-precision approach procedures (NPA)
- Individuals and organisations conducting flight crew training
- Aerodrome operators

Why this CAAP was written

- The purpose of this publication is to provide guidance on the conduct of NPAs and compile the relevant requirements, standards and practices in one document
- This publication also provides information on changes to NPA design and charting

Status of this CAAP

This is the second issue of CAAP 178-1.

For further information

For further information contact your local CASA office or CASA Operations and Flight Crew Licensing Standards, Canberra.

ABBREVIATIONS

AGL	Above ground level
AMSL	Above mean sea level
APV	Approach with Vertical Guidance
AWIB	Automatic Weather Information Broadcast
AWS	Automatic Weather Stations
CAR	*Civil Aviation Regulation 1988*
CASR	*Civil Aviation Safety Regulation 1998*
CFIT	Controlled flight into terrain
DA	Decision altitude
DAP	Departure and approach procedures
DH	Decision height
DME	Distance Measuring equipment
EMS	Emergency Medical Service
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HLS	Helicopter landing site
IAL	Instrument approach & landing chart
IAP	Instrument approach plate
ICAO	International Civil Aviation Organisation
LLZ	Localizer
MAPt	Missed approach point
MDA	Minimum Descent Altitude
NDB	Non-directional beacon
NPA	Non-precision approach
OLS	Obstacle limitation surface
PA	Precision approach
PANS-OPS	Procedures for Air Navigation ICAO Doc 8168
PAPI	Precision approach path indicator
RNAV	Area Navigation
TSO	Technical Standard Order
T-VASIS	“T” Visual approach slope indicator system
VAA-H	Visual approach area-helicopter
VHF	Very high frequency
VNAV	Vertical navigation
VOR	VHF Omni directional radio range

1. Introduction

1.1 Relevant Documents

Aeronautical Information Publication Australia

AIP ENR Section 1.5 contains the rules and procedures for instrument approach procedures including non-precision approach procedures.

ICAO Procedures for Air Navigation — Air Operations, DOC 8168-OPS/611

This document is commonly referred to as PANS-OPS and contains the criteria used in the design of instrument approaches in Australia. Volume I – Flight Procedures is published for the information of pilots and aircraft operators. Volume II is intended for use by persons engaged in the design of instrument flight procedures.

CASR Part 173 Instrument Flight Procedure Design Manual of Standards (MOS)

CASR Part 173 regulates the design of instrument flight procedures. Additional rules for the design of instrument procedures are contained in the CASR Part 173 MOS in cases where rules differ from or are additional to those contained in PANS-OPS.

CASR Part 139 Aerodromes

The standards for aerodromes that are serviced by NPAs are contained in CASR Part 139 MOS.

2. General

2.1 WHAT IS A NON-PRECISION APPROACH?

The term NPA has been traditionally used to describe an instrument approach procedure other than a precision approach. Precision approach systems currently in general use are ILS (Instrument Landing System) and MLS (Microwave Landing System).

An NPA is characterized by a Minimum Descent Altitude (MDA), a Missed Approach Point (MAPt) and a lack of electronic vertical course guidance, and may use any of a number of navigation systems for course guidance including NDB, VOR, LLZ or RNAV.

NPAs are designed to permit safe descent to a Minimum Descent Altitude (MDA), and further descent must not be made unless the pilot is able to proceed visually. Unlike a Decision Altitude (DA) associated with a precision approach, where loss of height during the initial stage of a missed approach is taken into account, obstacle clearance is not assured if descent below the MDA occurs, and pilots need to ensure that descent is arrested prior to reaching the MDA.

Non-precision approaches terminate in a visual segment that may provide for:

- a "straight-in" landing, or
- a circling approach that requires manoeuvring to align the aircraft with the landing runway, or
- a visual leg from a point where the MDA is reached to the circling area of the aerodrome.

Note: New instrument approach procedures are in the process of development, which have characteristics that are not necessarily associated with either non-precision or precision approaches. Additionally aircraft equipment and piloting techniques can be used to permit many approaches to be flown in a manner similar to an ILS and some operators are now describing approaches as either "ILS" or "non-ILS" rather than non-precision or precision.

It is expected that the terms non-precision and precision will eventually lose their significance and a review of terminology is currently being considered within ICAO.

However, as the classification of approaches is not yet resolved, in this CAAP the term NPA and the general application of the term are retained.

2.2 Vertical Navigation

Non-precision approaches are designed as a series of decreasing minimum altitudes to a minimum descent altitude (MDA). A fix is located at each point at which critical obstacles have been passed by an adequate margin, and it is safe to continue descent to the next safe altitude.

In the past NPAs have commonly been flown as a series of descending steps conforming to the minimum published altitudes. This technique is colloquially referred to as the "dive and drive" method. Unfortunately many Controlled Flight into Terrain (CFIT) accidents have been attributed to this technique, due to human errors such as descending before a step is reached or failing to arrest descent. In addition the aircraft's descent is more difficult to manage due to changes in airspeed, rate of descent, and configuration.

Australian NPAs are now published with a constant angle approach path, which clears all minimum altitudes, and facilitates the use of a stabilized descent technique. This method of promulgation is now the standard adopted for Australian non-precision approach procedures and the constant angle stabilized approach technique is the recommended flight technique for all aircraft.

Figure 1 shows an example of an NPA profile.

DIST BY DME	2.1	3	4	5	6	7	8	9.1					
ALT (3° APCH PATH)	580	855	1175	1495	1810	2130	2450	2800					

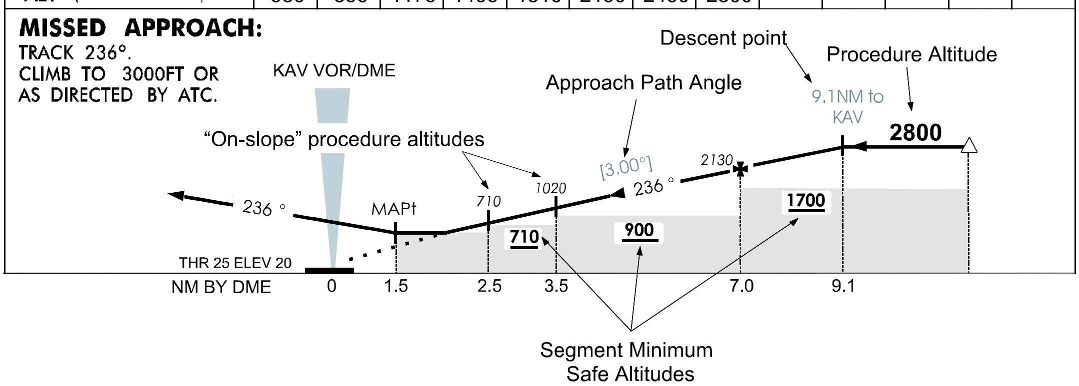

Figure 1 – Typical Constant Angle Approach Profile

2.3 WHAT'S A PROCEDURE ALTITUDE?

AIP defines procedure altitude as follows:

> ***Procedure Altitude**: A specified altitude, flown operationally at or above the minimum altitude and established to accommodate a stabilized descent at a prescribed descent gradient/angle in the intermediate/final approach segment.*

The term *procedure altitude* is used to identify that an altitude is promulgated to facilitate flying the procedure. This is in contrast to segment minimum safe altitudes that provide minimum obstacle clearance. The procedure altitude is therefore a recommended level, and an aircraft is not required to maintain the procedure altitude, unless instructed by ATC. A procedure altitude will always be at or above the minimum altitude for obstacle clearance.

Procedure altitudes are shown on the profile diagram at the commencement of the procedure and at each fix or significant point on the approach.

2.4 WHAT ARE THE SHADED AREAS ON THE PROFILE DIAGRAM OF AN NPA?

At each stage of a non-precision approach a *segment minimum safe altitude,* depicted as a "not below altitude" (e.g. **1700)** identifies the lowest altitude that provides the required obstacle clearance. ICAO has identified that many CFIT accidents have occurred because pilots did not possess good situational awareness in regard to terrain beneath the approach flight path. Australian charts are shaded beneath the segment minimum safe altitude to graphically illustrate the presence of obstacles or terrain to aid vertical situational awareness.

2.5 CAN I DESCEND TO THE MINIMUM SEGMENT ALTITUDE INSTEAD OF FOLLOWING THE CONSTANT ANGLE APPROACH PATH?

Yes. Obstacle clearance is provided at or above the segment minimum safe altitude (shaded areas). The constant angle vertical approach path is the recommended flight path designed to enable a stabilized descent.

2.6 WHAT IS THE MINIMUM DESCENT ALTITUDE (MDA)?

The MDA is the lowest altitude that can be used in IMC. Flight below the MDA reduces the clearance above obstacles and is not permitted in IMC.

The published MDA may include an allowance for barometric error, depending upon the location and the availability of an actual aerodrome barometric pressure. Instrument approach charts identify when an allowance is added to the MDA, by use of a shaded minima box or by publishing an additional MDA.

Where a 24-hour air traffic service is available the published MDA normally is based on the use of the local aerodrome QNH as reported by ATC and no allowance is added to the MDA.

At other aerodromes, an allowance of 100ft is included in the published MDA to provide for the accuracy of a forecast aerodrome QNH. If an actual aerodrome QNH is available (e.g. AWIS) the 100ft tolerance for forecasting accuracy is not required and the MDA may be adjusted accordingly.

Where a forecast QNH (TAF) is not available and Area QNH is used the allowance of 100ft may be insufficient to take into account the forecasting tolerance and the pilot must add 50ft to the published MDA.

2.7 WHAT ALLOWANCE SHOULD BE MADE FOR WIND?

Timing specified for holding and approach procedures includes an allowance for adverse winds. Pilots should not rely solely upon the design allowances and adjustment should be made for known or estimated winds to ensure that the aircraft remains within the design obstacle protection area, and to facilitate the successful completion of the approach within normal operating limits.

2.8 CAN I USE A VNAV SYSTEM TO FLY THE APPROACH?

A variety of certified or approved vertical navigation systems are available, or are expected to become available. However, at present NPAs in Australia are not designed to provide obstacle clearance solely by use of a vertical navigation system (VNAV).

Until NPAs are designed to provide obstacle clearance based on VNAV tolerances, any published altitude limitations must continue to be observed. Provided all such requirements are monitored and met, a VNAV system may be used to assist in flying a stabilized approach.

2.9 CAN I FLY AN RNAV APPROACH?

Yes. At present the only Area Navigation (RNAV) instrument approach procedures available in Australia are based on GPS. These procedures, commonly referred to as a GPS/NPA, from 25th November 2004 will be identified on approach charts as $RNAV_{(GNSS)}$ approaches. Aircraft equipped with TSO C129a or other approved GNSS systems may conduct $RNAV_{(GNSS)}$ approaches. Not all aircraft fitted with GPS (including FMC equipped aircraft) are approved for approach operations and pilots should determine the operational approvals applicable to each aircraft type.

Although many aircraft fitted with modern Flight Management Computer (FMC) systems have the capability to fly other approach procedures using RNAV, including procedures based on conventional navigation aids, the use of RNAV in place of the ground-based aid is not approved in Australia.

An RNAV system may also be used to assist in flying a conventional approach. However, it is necessary for the navigation system upon which the procedure is based to be monitored (NDB, VOR, etc) to ensure that the obstacle clearance requirements of the approach are met, and that the procedure is flown within the tolerances of the navigation system on which the procedure is based.

3. Straight-in approaches

3.1 WHAT IS A STRAIGHT-IN APPROACH ?

A non-precision approach that is aligned with a suitable runway may permit an aircraft that becomes visual at or above the MDA to continue descent and land “straight-in”. This is commonly referred to as a *straight-in* or *runway* approach.

Approaches where the final approach course is not suitably aligned with a landing runway, or where the runway does not meet the required standard, will terminate at a circling MDA from which some manoeuvring is normally required before the aircraft can conduct further descent.

A straight-in approach is identified by the use of the runway direction in the title, e.g. RWY 14 NDB, and may be also be annotated in the minima box. e.g. by the letters S-I (straight-in).

Note: Refer also to special procedures applying to helicopter approaches in Section 7.

3.2 What are the Advantages of a Straight-in Approach?

It is commonly acknowledged that runway approaches are much safer than circling approaches. In Australia, instrument approach procedures are designed as straight-in approaches wherever possible.

3.3 Why aren't all approaches Straight-in Approaches?

In order for the aircraft to be able to safely land straight-in, the pilot needs to be able, at or before reaching the MDA, to sight the runway, align the aircraft with the centerline, and continue descent without significant changes to the descent rate, while visually avoiding any terrain in the runway approach area. In many cases a straight-in approach also permits a lower MDA but this also limits the amount of time and distance available to the pilot to complete the visual segment of the approach.

Therefore the approach alignment, descent gradient, runway dimensions and runway approach surfaces all need to meet appropriate standards. Where these standards can be met, a runway approach will be designed, but in those cases where it is not possible to comply with the standards only a circling approach is published.

3.4 What are the Standards Required for the Publication of a Runway Approach?

Alignment. To avoid the necessity to conduct turns close to the ground, the alignment of the final approach course needs to be closely aligned to the runway centreline. PANS-OPS design rules permit the final approach course to intersect the extended runway centerline at an angle up to 30° for Category A/B procedures and at up to 15° for Category C/D. The final approach course also needs to intersect the extended runway centerline at a sufficient distance from the threshold to allow a turn onto the runway heading to be completed safely.

Note: Instrument approach procedures are designed to accommodate varying aircraft performance by the use of an Aircraft Performance Category based upon approach speed. Approach procedures in Australia are designed for Category A, B, C & D. Category A applies to aircraft with low approach speeds, and each successive category applies to aircraft with higher approach speed. A separate Category H applies to approaches designed for use by helicopters only. Refer AIP ENR 1.5

Descent gradient. For an approach to be safe the descent gradient should be neither too steep, nor too shallow. A steep approach requires high rates of descent which can result in inadvertent descent below critical altitudes. An approach that is too shallow can also increase risk. Straight-in approach procedures are normally designed with a 3° (5.2%/320 ft per NM) gradient, but where necessary this may be increased to a maximum of 3.72° for Cat A/B procedures or 3.5° for Cat C/D. A descent gradient of less than 3° is not normally published.

Runway Standards. Runways serving straight-in approaches need to be of adequate dimensions to enable an aircraft to land after becoming visual at the MDA and must provide adequate clearance from obstacles on the visual segment of the approach path. Runways that conform to these standards are termed non-precision approach runways (NPA runways). Runways that do not meet these standards may conform to a lesser standard suitable for VFR or circling IFR approaches and are referred to as non-instrument runways.

In Australia runway standards are contained in the CASR Part 139 MOS. These standards are based on ICAO Annex 14 requirements modified to meet Australian circumstances.

Obstacle Limitation Surfaces (OLS). Runway standards incorporate a set of surfaces surrounding an aerodrome referred to as the OLS. Critical to the safe conduct of a straight-in approach is the surface immediately below the approach path. For straight-in non-precision approaches, the Australian standard specifies an approach surface gradient of 3.33% along the final approach flight path and obstacles in this area should not be permitted above the approach surface. In cases where this is not possible and obstacles penetrate the approach surface an assessment of risk is required. Where obstacles are assessed to constitute an unacceptable risk, they may be required to be removed unless the risk can be mitigated by other means such as lighting and marking. Where penetrating obstacles cannot be removed or the risk reduced to an acceptable level, a straight-in approach is not published.

Note: For details on OLS dimensions refer to CASR Part 139 MOS.

Runway and Runway Strip Width. A pilot conducting a straight-in NPA after sighting the runway has limited time and distance in which to align the aircraft for landing, and the runway strip width must be enough to ensure that a safe landing can be made. For runways with strip width less than 300m the MDA is raised slightly to allow additional time and distance for manoeuvring to align the aircraft with the runway. Where the strip width does not meet the minimum standard, a straight-in landing minimum is not published.

3.5 If I Don't Know What the Wind is Can I Descend to the Straight-in MDA?

Yes, but you need to consider the possibility that you might need to circle and it may be advisable to limit descent to the circling MDA. In most cases the landing MDA is lower than the circling MDA, and if descent is continued to the lower altitude a circling approach may not be possible. Pilots should not commit to a straight in landing unless they can be satisfied that wind conditions are suitable.

Windsocks, even if located near the threshold of the landing runway, can be difficult to interpret until late on final approach especially in poor visibility or at night, and should not be relied upon. In many cases windsocks are located near the centre of the aerodrome which reduces their visibility.

Automatic Weather Stations (AWS) have been installed by the Bureau of Meteorology at most aerodromes served by instrument approaches, but many of those installations are not equipped with VHF broadcast facilities. The cost of adding VHF capability is quite low and operators can arrange with the Bureau of Meteorology for a VHF broadcast facility to be installed. (Normally the cost of installation is borne by the operator).

An Automatic Weather Information System (AWIS) facility broadcasting on VHF provides a very good source of wind information. In addition, where the published minimum altitude is based on a forecast aerodrome QNH, an AWIB enables the published minimum altitude to be reduced by 100ft.

3.6 Why is the Visibility for a Straight-in Approach Usually Greater than for Circling?

In order for a successful straight-in approach and landing to be conducted, the pilot of an aircraft conducting a runway approach must be able to see the runway prior to or on reaching the MDA. The visibility published on Australian charts is determined by calculating the distance from the runway threshold to the point on a normal 3° descent path at which the MDA is intercepted. A margin of 160m is added to that distance to allow visual reference to a reasonable amount of runway. Visibility for a straight-in approach therefore varies only with the height of the MDA above the runway.

Visibility for circling operations varies with aircraft category. It is based on the radius of turn that an aircraft in each category would require in adverse wind conditions to manoeuvre from a downwind position to align with the landing runway.

4. Circling approaches

4.1 WHEN IS A CIRCLING APPROACH PUBLISHED?

A circling MDA will normally be shown for a straight-in approach procedure to permit circling to other runways, however where all the requirements for a runway approach cannot be met, ***only*** a circling approach is published.

In some cases, although the final approach course may be runway-aligned, other factors will preclude the authorisation of a straight-in approach. Those factors may include:

- Final approach course not within the alignment criteria
- Final approach gradient too steep
- Obstacles above the 3.33% OLS
- Runway not surveyed to the required standard
- Aerodrome status. (Certified and registered aerodromes are operated under rules that require regular safety inspections, reporting of aerodrome serviceability/status, and the monitoring of obstacles.)

4.2 HOW ARE CIRCLING ONLY APPROACHES IDENTIFIED?

An NPA that only provides for a circling procedure is identified in the title by reference to the navigation system only. (e.g. NDB) Where more than one circling approach procedure is published at an aerodrome, the procedures title includes a suffix using letters from the beginning of the alphabet. e.g. NDB A, VOR B.

For RNAV procedures the suffix may also be used to indicate the direction of the final leg to aid in pilot orientation. For example, $RNAV_{(GNSS)}$ E indicates an approach from an easterly direction. The letters N, S, E, and W are used as the suffix in these cases.

4.3 VISUAL LEGS

In rare cases a procedure may specify descent to a position outside the circling area, and require that a visual leg be flown from that position to establish the aircraft within the circling area. In such cases obstacle clearance on the visual leg is the responsibility of the pilot and the visual leg must be flown clear of cloud and in sight of ground or water in conditions meeting specified altitude and visibility.

5. DME or GPS Arrivals

5.1 Is a GPS or DME Arrival an NPA?

Yes. A DME or GPS arrival is a procedure unique to Australia that provides a non-precision approach to a circling minimum. A DME or GPS arrival is designed using the same criteria as used in conventional NPA design.

5.2 What is Different about a DME or GPS Arrival?

DME or GPS arrivals are normally designed to permit descent from the en-route phase without the need to locate the aircraft overhead the navigation aid or conduct a sector entry. Entry to the procedure is often available from any direction but commonly is limited to sectors or specific tracks. Where sectors are promulgated, an aircraft can be manoeuvred to intercept any particular track, provided this is done prior to reaching the Final Approach Fix (FAF). This procedure enables an arriving aircraft to be positioned on a convenient track for subsequent circuit entry or a straight-in approach, but prior to reaching the FAF the aircraft must be established on the final approach course and from the FAF the aircraft speed must be established within the range of speeds specified for the final leg.

5.3 Where is the FAF on a DME or GPS Arrival?

The FAF is annotated on the approach chart, except for some procedures designed to old criteria. In such cases the final approach commences at 10 DME/GPS.

5.4 How are DME or GPS Arrivals Charted?

The charting of DME or GPS arrivals varies between chart suppliers but in general they have usually been shown as series of descending steps on particular tracks or within a specified sector.

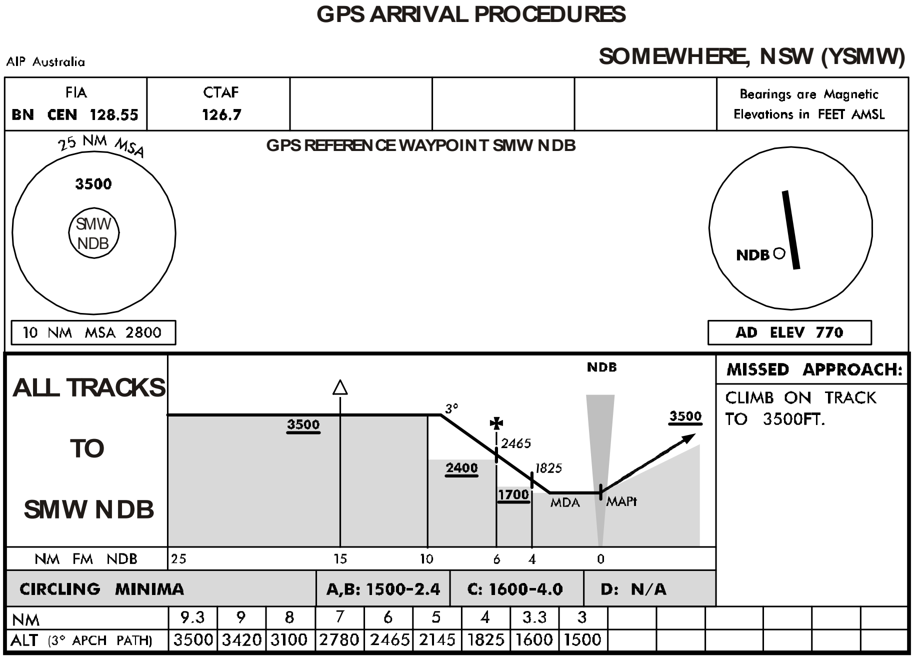

Figure 2 - Example of New Format DME or GPS Arrival Chart

AIP/DAP DME and GPS arrival charts are being progressively redrawn in a format similar to normal NPA charts, and incorporating a constant approach path. The constant approach path is designed to provide a 3° constant angle approach where possible, and terminating at a circling MDA within the circling area (Refer Fig 2).

5.5 CAN I USE GPS FOR TRACK GUIDANCE ON A GPS ARRIVAL?

No. GPS arrivals are designed using the navigation tolerances applicable to the ground-based aid (NDB or VOR). These tolerances include allowances for the accuracy of the navigation aid and piloting accuracy.

6. The visual segment

6.1 WHEN MAY I DESCEND BELOW THE MDA?

Descent below the MDA may be made when visual contact is made with the runway or runway environment (i.e. the runway threshold or approach lighting or other markings identifiable with the runway) and kept in sight during the subsequent approach and landing. The approach procedure may support a straight-in visual segment or a "circle-to-land" procedure may be required.

6.2 STRAIGHT-IN APPROACH

If the NPA is a runway approach and, at an altitude above the straight-in MDA, you have the runway in sight and the required visibility you may continue descent. In doing so you must nevertheless be sure that obstacles in the approach path are avoided. Protection from obstacles beneath the approach path is aided by aerodrome design standards, including Obstacle Limitation Surfaces (OLS). Aerodrome standards, based on ICAO Annex 14 and modified to suit Australian operating conditions, are published in CASR Part 139 Manual of Standards.

Aerodrome standards supporting a straight-in non-precision approach provide for an OLS beneath the final approach, which is surveyed to identify obstacles above a 3.33% gradient from the end of the runway strip.

The approach OLS 3.3% surface provides a buffer to a normal 3-degree (5.2%) approach path. Obstacles penetrating above the OLS that may be considered a hazard to an aircraft conducting a visual approach will be marked and/or lit, unless removed. Other precautions such as installing visual approach guidance (PAPI or T-VASIS) may also be used.

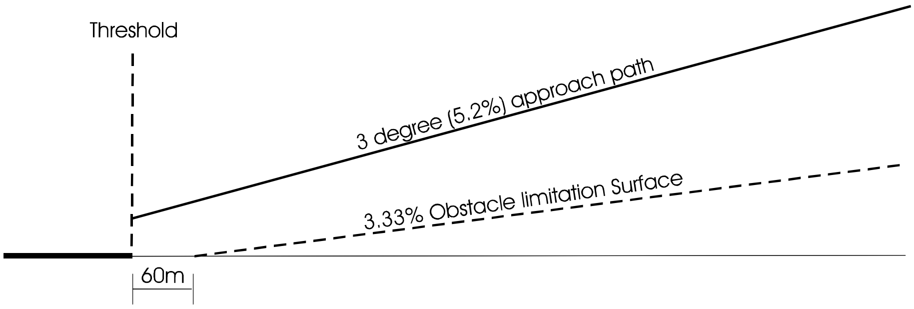

Figure 3 - Approach Obstacle Limitation Surface

It will be safe to continue on a visual descent below the MDA, provided the approach path of the aircraft is consistent with the protection afforded by runway standards. If an aircraft is flown below a normal (3 degree) approach then the safety margin between the aircraft and obstacles beneath the approach is reduced.

Instrument approaches that use distance measurement, either DME or GPS, are provided with an altitude/distance table that enables a constant angle approach to be flown. Provided, on establishing visual contact, the aircraft continues a stabilized descent to the runway, a safe margin above the approach OLS will be maintained.

In recognition of the added safety afforded by straight-in approaches, some NPAs without DME have been published as straight-in approaches. (e.g. RWY 12 VOR). As an altitude/distance scale is not available in those cases, the distance and approach angle to the runway from the point at which the pilot becomes visual will vary.

Descent should not be continued below the MDA until the aircraft is established on a safe approach path, in order to ensure clearance from obstacles beneath the approach. This may necessitate flying level at the MDA until a safe approach angle to the runway is intercepted.

6.3 CIRCLING APPROACH

Circling approaches normally require manoeuvring to align the aircraft with a suitable runway. Circling is a visual procedure that can be very hazardous if not executed correctly.

Circling rules are published in AIP ENR 1.5 Section 1.7. These rules have been developed as the result of many years' experience, and if followed, enable the safe termination of an instrument approach.

What is the circling area?

The circling area is an area bounded by arcs drawn from the runway ends within which obstacle protection at the MDA of not less than 300ft for CAT A/B and 400FT for Cat C/D is provided. The size of the circling area is based on the maximum IAS permitted for each aircraft Category. In order to maintain obstacle protection the aircraft must be maintained within the circling area by visual reference to the runway. The maximum speeds are published in PANS-OPS and reproduced in the Australian AIP in AIP ENR 1.15 Table 1.1

Category	KIAS
A	100
B	135
C	180
D	205

Table 1 - Maximum circling IAS

By day, and complying with the rules for circling, a pilot may elect to descend below the MDA, but in doing so must take responsibility for obstacle clearance. As spot heights on IAL charts do not necessarily indicate the highest terrain, or all obstacles in the circling area, pilots should only exercise this option when they are familiar with the terrain in the circling area. Although instrument approach charts show significant obstacles they do not provide detailed terrain information. Without detailed local knowledge, it is generally a safer option to utilize the obstacle protection afforded by remaining at the MDA.

What is the purpose of a no-circling area?

The circling MDA is calculated by adding a minimum obstacle clearance of 300ft (Cat A/B) or 400ft (Cat C/D) to the highest obstacle in the circling area. In order to permit a lower MDA, a no-circling area is sometimes published to eliminate obstacles in part of the circling area. Provided a pilot avoids the no-circling area, the required obstacle clearance applicable above all other obstacles is maintained.

Within the no-circling area, as the required obstacle clearance at the MDA is not provided, conditions need to be such that the pilot can see and avoid obstacles. For that reason, circling should not be conducted within the no-circling area unless by day and in VMC.

In some cases the missed approach point is located within the no-circling area, and a circling approach may not be possible if the no-circling area is entered before reaching the missed approach point. To avoid this limitation it is advisable to descend to the MDA as early as possible to achieve visual contact before entering the no-circling area.

Why are the rules different for day and night?

At night it may not be possible to maintain visual clearance from obstacles even if those obstacles are lit or shown on instrument approach charts. For this reason the rules for circling at night require that the MDA is maintained until in a position where a normal descent can be conducted, and the aerodrome Obstacle Limitation Surfaces (OLS) are intended to enable a safe approach to be conducted in those circumstances. (Refer AIP ENR 1.5 para 1.7.2). However the responsibility for maintaining adequate obstacle clearance still remains with the pilot and caution should be exercised. Descent should not be commenced or continued until obstacles that may affect a safe visual approach from the MDA are identified or passed.

Note: Aerodromes that are Certified or Registered are required under CASR Part 139 to meet standards for the survey and monitoring of Obstacle Limitation Surfaces. Aerodromes that are not certified or registered (referred to currently as "unlicensed" and under CASR Part 173 as "other" aerodromes) are not required to meet OLS standards and pilots should ensure that they are familiar with terrain in the circling area before conducting an approach.

Missed approach during circling

If visual reference is lost during circling, a missed approach must be executed. However, as the position at which the missed approach is initiated can be anywhere within the circling area, and the aircraft may commence the missed approach from below the MDA, the procedure designer has no means of designing a single procedure that will ensure obstacle clearance in all cases.

In executing a missed approach from within the circling area, the assumption is made that the area above the aerodrome is generally free of hazardous obstacles and a climbing turn should be made in that direction. Climb overhead the aerodrome should be continued to a safe height and the aircraft then tracked to establish flight on the published missed approach.

Why is a circling MDA published at some locations when the final approach is runway aligned?

Final approach course alignment is only one of a number of criteria that need to be met for a straight-in approach. Unless all the requirements can be satisfied, only a circling MDA is published.

Does that mean that a straight-in approach cannot be made in those cases?

No. It means that the instrument approach procedure and/or the runway approach surfaces do not meet all the associated safety standards. If on becoming visual the pilot assesses that the aircraft is in a suitable position to land straight-in, and the pilot is considers that it is safe to do so, a straight-in approach can be conducted provided the rules for circling are followed. Those rules include the requirement to be established within the circling area before leaving the MDA. (AIP ENR 1.5 Section 1.7). If the decision is made to “circle” straight-in, the pilot should take into account that the runway and the runway approach area may not meet the standards for a straight-in approach and caution should be exercised.

7. Helicopter procedures

7.1 What Approaches Can I Fly in a Helicopter?

All fixed-wing Category A approaches can be flown by appropriately equipped helicopters, provided the speeds flown are within the Cat A range. The use of V_{at} is not applicable to helicopters.

7.2 Are Helicopter Approaches Different to Fixed wing Approaches?

Approaches which are designated Cat H are designed to different parameters and can only be flown by helicopters. Helicopter approach procedures are designed to criteria that are more appropriate to the flying speeds, performance, and handling characteristics of helicopters. Differences include increased maximum permissible approach gradients, shorter segment lengths, and may include increased missed approach gradients.

7.3 Why Aren't Some Helicopter Approaches Published in the AIP/DAP?

Instrument approach procedures that are designed for emergency medical services (EMS) approaches to helicopter landing sites (HLS) are not published in the AIP/DAP. (These operations are designated "specialised helicopter operations" under CAR 178). Unlike fixed wing operations, which are designed to terminate in a standard aerodrome environment, EMS helicopter approaches deliver the aircraft to a point near a helicopter landing site from which specific procedures are needed for each approach to enable the visual segment to be conducted safely. The CASR Part 173 Manual of Standards requires a helicopter operator to publish in the company operations manual specific operational procedures for each approach and HLS.

7.4 What is the VAA-H?

The VAA-H is an Australian concept devised to facilitate the visual termination of a helicopter RNAV approach at an HLS, and performs a similar function to the circling area at an aerodrome.

The VAA-H provides obstacle clearance within an area 0.5 NM either side of the nominal track from the MAPt to the HLS, and relies upon visual navigation using key features or "lead-in points" to navigate to the HLS so that continued flight past the MAPt to the HLS is possible in visibility that may be as low as

800m. Descent from the MDA is not permitted until the HLS is sighted and a normal approach can be completed.

A particular feature of the VAA-H is that missed approach obstacle protection is assured provided the missed approach is commenced at the MDA from a position within the VAA-H. This enables the helicopter to proceed past the MAPt in circumstances where the successful completion of the visual segment is not assured without compromising the safety of the missed approach.

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