



**Civil Aviation
Advisory Publication
August 1999**

Non-Precision Approach Runways: Aerodrome Standards Considerations

This publication is advisory only. It gives the preferred method for complying with the Civil Aviation Regulations 1988 (CAR 1988). It is not the only method, but experience has shown that if you follow this method you will comply with the CAR 1988.

Read this advice together with the appropriate regulation and Civil Aviation Orders.

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The relevant regulations

- Regulation 89P of CAR 1988
- also regulations 89S, 89T, 89X and 92A of CAR 1988

Who this CAAP applies to

- aerodrome operators;
- aircraft operators desirous of conducting Non-Precision Approach (NPA) operations using either ground-based navigation aids or the satellite based Global Positioning System (GPS) navigation system.
- NPA procedure designers.

Why this publication was written

Previously, instrument approach procedures were designed to allow aircraft to descend down to the circling minima. CASA encourages NPA procedures to be provided if terrain permits, as NPA procedures enhance the safety of aircraft operations. The NPA procedures may use either ground-based navigation aids or GPS. However, before NPA procedures are provided for an aerodrome, the aerodrome must meet the appropriate aerodrome standards. This CAAP provides advice on the applicable standards which apply to a NPA runway.

Status of this CAAP

This is the second issue of CAAP 89P-1 and supersedes CAAP 89P-1(0). The title of the CAAP has been changed to apply to all NPA runways, instead of only GPS NPA runways.

For further information

Contact the CASA office closest to you.

1. General

1.1 – Instrument approach procedures are designed to enable pilots to operate under Instrument Flight Rules (IFR) in Instrument Meteorological Conditions (IMC). The instrument approach procedures may direct aircraft to either descend down to circling minima and conduct a visual circling approach, or to a runway aligned position down to the runway landing minima and conduct a straight-in approach.

1.2 – Where the instrument approach procedure does not provide a straight-in approach, the runway is still classified as a non-instrument runway. Where the instrument procedure provides for a straight-in approach, the runway is classified as an instrument non-precision approach (NPA) runway.

1.3 – CASA strongly recommends that, where terrain permits, NPA procedures be provided as they enhance the safety and efficiency of aircraft operations.

1.4 – NPA procedures may use ground-based navigation aids, such as VOR, DME, NDB, etc. Increasingly, NPA procedures may also be designed using GPS. The use of GPS allows NPA procedures to be provided to aerodromes which have no access to ground-based navigation aids.

1.5 – Before a GPS NPA procedure is designed and published for a particular runway, the runway must meet the standards of a NPA runway. At some aerodromes there may be a cost involved in meeting these aerodrome standards. Whilst it is the prerogative of an aerodrome operator to determine whether his or her aerodrome should be upgraded, CASA strongly recommends that aerodrome operators avail themselves of the benefit of GPS technology.

2. Who may request NPA procedures

2.1 – Request for NPA procedures may come from the Regional Airspace Planning and Advisory Committee (RAPAC), airline operators, aviation organisations, or aerodrome operators.

3. Who designs NPA procedures

3.1 – Currently, NPA procedures are designed by the Airservices Australia Procedure Design Section and other design organisations holding a delegation under CAR 178. Procedures are published in the Aeronautical Information

Publication document titled “Departure and Approach Procedures”, commonly known as DAP plates or charts.

3.2 – Any proposal for, and design of, instrument approach procedures to a runway should only be made with the knowledge that the runway meets the appropriate aerodrome standards for NPA. Use of a runway which does not meet the appropriate aerodrome standards for NPA procedures could result in unsafe situations.

4. Applicable aerodrome standards

4.1 – Aerodrome standards. The standards for a NPA runway are different to the standards applicable to a non-instrument runway in several aspects. These include:

- runway strip width
- approach OLS area and gradient
- availability of wind direction indicator near the threshold
- runway edge light spacing

4.2 – RUNWAY STRIP WIDTH

4.2.1 – Many existing aerodromes have runways of 30 metres width contained within runway strips 90m to 150m wide. NPA procedures may be designed for runways with strip widths down to 90m provided the landing minima is adjusted in accordance with design requirements. The 90m strip width for NPA procedures are limited only to runways used by code 1, code 2 and up to code 3C aeroplanes. (Runways accommodating aeroplanes above code 3C (eg. B737) require a minimum graded runway strip width of 150m).

4.3 – APPROACH OLS AREA AND GRADIENT

4.3.1 – The standard approach obstacle limitation surface (OLS) area for a NPA runway is considerably larger than a non-instrument runway. They are specified in Chapter 10 of CASA publication “Rules and Practices for Aerodromes”. For code 1 and code 2 runways, the increases are not extensive. For a code 3 runway, the differences in the approach OLS area are:

- length - increases from 3000m to 15000m
- length of the inner edge - 150m.
- side splay - increases from 10% to 15%

- approach gradient - down from 3.3% to 2% in the first section, 2.5% in the second section and horizontal for the third section.

4.3.2 – It should be noted that a code 3 runway also requires a 180m inner edge for the take-off surface, unless the runway is used only by aircraft with MTOW of less than 22700 kg and operating only in Visual Meteorological Conditions (VMC) during the day.

5. Addressing obstacles within the approach OLS area

5.1 – To facilitate the introduction of NPA procedures without compromising aircraft safety, the following procedures may be used in dealing with obstacles within the approach OLS area:

- Obstacles within 3000m of the inner edge of the approach surface (2500m for code 1 and 2 runways) are to be identified based on the applicable standard.
- Objects previously not identified as obstacles, but which are classified as obstacles under the applicable standards, are to be referred to the relevant CASA Office for assessment of their impact upon aircraft operations and the need for marking and/or lighting of such obstacles. The obstacle data should also be provided directly to the procedure designer concerned. In the case of Airservices, the Procedure Design Section contact is Tel: 02 6268 5081, Fax: 02 6268 5696.
- For areas beyond the 3000m, the procedure designer will obtain obstacle information from the national tall structure data bank and topographical maps.
- Before a new or revised procedure is cleared by CASA for publication, the procedure will be flight validated to ensure that the required obstacle clearances are provided in the design.
- The procedure designer will advise the aerodrome operator of the critical obstacles which govern the procedure minima, including allowances provided for the height of vegetation.
- After the NPA straight-in procedure is published, the aerodrome operator will be required to monitor the approach OLS area and report any new obstacles or potential obstacles to the relevant CASA Office and to the Airservices Procedure Design Section.

- 5.2 – If there is any query, contact the CASA aerodrome inspector responsible for the area in which the aerodrome is located.

6. Wind direction indicators

6.1 – AVAILABILITY OF A WIND DIRECTION INDICATOR NEAR THE THRESHOLD

6.1.1 – Because the primary wind direction indicator (WDI) may not be visible from the approach minima, NPA runways require WDI near the threshold to provide surface wind information to pilots of landing aircraft. However, if another acceptable means of providing surface wind information is available, such as through an aerodrome weather information broadcast (AWIB), or an approved observer with a suitable communication link, the WDI requirement may be waived. Alternative arrangements for provision of surface wind information should be made with the relevant CASA Office if there is no WDI near the threshold.

In addition, if a WDI is located near the threshold for NPA procedures purposes, and the NPA procedures are conducted at night, appropriate illumination of the WDI will have to be provided.

7. Runway edge lights

7.1 – RUNWAY EDGE LIGHT SPACING

7.1.1 – Existing runway edge lights for a non-instrument runway are normally spaced 90-100m apart. For a NPA runway, the lights should be spaced not more than 60m apart. However, NPA procedures may be provided for a runway with runway edge lights spaced at 90-100m apart, subject to the visibility minima being not less than 1.5 km and provided there are no extraneous lights around the aerodrome which may affect visual acquisition of the runway.

7.1.2 – Before NPA procedures are made available for night use, the lighting system will need to be checked. This checking will generally be done as part of the NPA flight validation process, or by the relevant CASA Office. The aerodrome operator concerned will be consulted if there is a problem with the aerodrome lighting.

8. Precautions for aerodrome works

8.1 – At aerodromes where NPA operations are conducted, aerodrome operators should ensure that time limited works are co-ordinated with arrival schedules to avoid risk to aircraft and persons on the ground.

9. GNSS precision approach runways

9.1 – Currently, development works are being done in the global navigation satellite system (GNSS) with local or wide area augmentation to enhance the accuracy of the system. It is likely that in the near future Cat I precision approaches will be able to be conducted to runways with no Instrument Landing System (ILS).

9.2 – The aerodrome standards will need to be met to support these operations are more stringent, particularly in regard to runway and approach lighting. Aerodrome operators should bear this in mind if they are considering upgrading their aerodrome lighting systems.

10. GPS NPA for HLS

10.1 – GPS NPA procedures may also be provided for helicopter landing sites (HLS), either on or off aerodromes. Currently, Australian standards do not specify NPA standards for HLS. In the interim, HLS meeting the NPA standards specified in ICAO Annex 14 Volume II are acceptable.

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