

## Appendix B: Night Vision Imaging Systems flights

Appendix B contains chapter 3 of the Part 91 MOS (compilation 3, dated 6 August 2022) relating to flights conducted using Night Vision Imaging Systems (NVIS).

To assist the reader, appendix B also contains the VMC criteria that apply for NVIS operations from chapter 2 of the MOS.

Part 91 MOS operational rules for NVIS flights are generally restated by the Part 133 and 138 manuals of standards. If you are operating or training under other Parts (such as 133 or 138), the rules that apply to you may be varied by the Part 133 or 138 MOS requirements for NVIS.

To fully comprehend any broader obligations you may have, it is recommended you review section 2.3 of the latest version of the 'Night Vision Imaging Systems' multi-part advisory circular [AC 91-13, AC 133-09 and AC 138.06](#), referred to in this guide simply as AC 91-13).

### VMC minima for NVIS operations (MOS table 2.07 (3A) and (3B))

The following diagram and table detail the VMC criteria that apply for NVIS operations:

**Figure 28: NVIS visibility**

#### Class C airspace – Below 10,000 ft



#### Any airspace – Below 10,000 ft



Class of airspace	Height	Flight Visibility	Distance from cloud	Conditions
C	Below 10,000 ft AMSL	5,000 m	Clear of cloud <i>Also refer Table 30</i>	VMC minimum applies to all NVIS operations.
Any	Below 10,000 ft AMSL	5,000 m or less, but not less than 3,000 m. In all cases, only with relevant CASA approval	<i>Also refer Table 30</i>	VMC minima apply providing: <ul style="list-style-type: none"> <li>› the flight is conducted under the Part 138 MOS by an aerial work operator, and</li> <li>› there are least 2 authorised NVIS crew members                             <ul style="list-style-type: none"> <li>» for an Australian aircraft, under Part 61</li> <li>» for foreign registered aircraft, the NAA of the state of registry of the aircraft, and</li> </ul> </li> <li>› the operator holds a CASA approval (see MOS 2.07 3C below).</li> </ul>

**MOS 2.07 (3C)** CASA may approve a minimum in-flight visibility requirement of less than 5,000 m but not less than 3,000 m for an NVIS operation for a particular class of airspace provided:

- › it is not for NVIS fire bombing, fire mapping or incendiary dropping, and
- › the operator's application includes a detailed risk assessment, and
- › given the risks, approval including any conditions (if required) issued, would not have an adverse effect on aviation safety.



*Refer to AC 91-13 for guidance on risk mitigators which would support an application for an approval. This AC also notes that it is not intended to grant approvals for routine or expected NVIS police or EMS operations.*



*See the stipulations regarding minimum crew, class of operation, IFR or VFR, and cloud separation requirements set out in MOS 3.10 below.*

## CASR 91.085 MOS NVIS requirements

This regulation requires you to comply with chapter 3 of the MOS, which is set out below.

### Purpose and applicability (MOS 3.01 and MOS 3.01A)

The purpose of chapter 3 of the MOS is to prescribe the requirements relating to an NVIS flight.

This chapter applies to the use of NVIS by a flight crew member of an aircraft in an NVIS flight.

This chapter does not apply to the use of NVIS by a person on an NVIS flight who is not a flight crew member unless the person is involved in air navigation or terrain avoidance functions.

These MOS requirements are applicable to all NVIS flights except:

- › flights conducted by an Australian air transport operator under Part 133 (refer to 133.265 NVIS flights), or
- › flights conducted by an aerial work certificate holder under Part 138 (refer to 138.350 NVIS flights)

To be clear, for limited aerial work operations (spotting and aerial photography with no remuneration), the requirements of this appendix apply.

NVIS equipment requirements are set out in appendix A of this guide (in MOS 26.74 - 26.79). (Refer to the Part 133 MOS for NVIS equipment requirements for Part 133 operations.)

## Definitions (MOS 3.02)

Chapter 3 of the MOS has the following specific definitions:

**IFR capable**, for an aircraft, describes a circumstance in which:

- › the aircraft is equipped for IFR flight in accordance with the regulations, and
- › the operating crew meet the relevant requirements for IFR flight under Part 61 of CASR.

**NVFR capable**, for an aircraft, describes a circumstance in which:

- › the aircraft is equipped for flight by night under the VFR in accordance with the regulations, and
- › the operating crew meet the relevant requirements for a VFR flight at night under Part 61 - Flight crew licensing.

**NVIS air crew member**, for a particular NVIS operation, means an air crew member:

- › of an NVIS operator who holds an AOC, a Part 141 certificate, or an aerial work certificate for the NVIS operation, and
- › who is qualified (however described) to carry out the person's assigned functions as an air crew member for the operation in accordance with this MOS.

**NVIS crew member** means an NVIS pilot, an NVIS trainee pilot or an NVIS air crew member.

**NVIS endorsement** means an endorsement issued under Part 61 Flight crew licensing.

**NVIS flight** means a flight conducted using a night vision imaging system.

**NVIS operation** means an NVIS flight in any of the following operations:

- › authorised Part 141 flight training for a person to qualify for an NVIS rating or endorsement
- › training and checking for a Part 141 operator in relation to its personnel who carry out the activities mentioned above
- › authorised Part 142 activities including:
  - » training for a person to qualify for an NVIS rating or endorsement
  - » contracted recurrent training of personnel holding an NVIS rating or endorsement
  - » contracted checking of personnel holding an NVIS rating or endorsement
- › training and checking for the Part 142 operator in relation to its personnel who carry out the activities mentioned above
- › a flight test (Part 61 Flight crew licensing)
- › an NVIS proficiency check (Part 61 Flight crew licensing)
- › a flight, conducted by a Part 141 operator or a Part 142 operator, for the purpose of ensuring the proficiency of an NVIS pilot
- › training or checking for a Part 133 operator in relation to its crew members who conduct NVIS flights during the operator's medical transport operations
- › a maintenance flight for the purpose of ensuring the serviceability of the aircraft, or the NVIS, for NVIS operations mentioned in any other paragraph of this definition
- › a test flight for the purpose of certifying the aircraft, or the NVIS, for NVIS operations mentioned in any other paragraph of this definition.

**NVIS operator** means the operator for an NVIS operation.

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**NVIS pilot**, for an NVIS flight, means a pilot who:

- › holds each of the licences, ratings and endorsements required for the NVIS flight by Part 61 of CASR, or
  - › if the aircraft is a foreign-registered aircraft – is authorised by the aircraft’s state of registry to pilot the aircraft for the NVIS flight.
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**NVIS rating** means a rating issued under Part 61 Flight crew licensing.

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**NVIS trainee pilot** means a pilot who:

- › does not hold an initial NVIS rating (Part 61 - Flight crew licensing) and
  - › is undergoing an approved course of training by a Part 141 or a Part 142 operator for the issue of such a rating, or is undergoing a flight test.
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**Part 141 operator** holds a Part 141 certificate to conduct recreational, private and commercial pilot flight training, other than certain integrated training courses.

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**Part 142 operator** holds a Part 142 authorisation to conduct integrated and multi-crew pilot flight training, contracted recurrent training and contracted checking.

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**safety area** means an area:

- › that is free of obstacles, other than those:
  - » with a height not exceeding 25 cm above the surface level of the area or
  - » that are required for air navigation purposes, and
- › whose purpose is to reduce the risk of damage to an aircraft accidentally diverging from the load-bearing area primarily intended for landing or take-off.

**Note 1** Obstacles required for air navigation include, for example, a wind direction indicator.

**Note 2** The safety area does not need to be a solid surface. For example, a perforated metal deck may constitute part, or all, of a safety area.

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**used, using or uses**, in relation to the use of NVIS, means used for safe air navigation by means of visual surface reference external to the aircraft conducting the operation.

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## General requirements for NVIS flights (MOS 3.03)

A rotorcraft in an NVIS flight may only take off from and land on the following types of helicopter landing site (HLS):

- › an HLS-NVIS standard (refer MOS 3.04 below for the requirements), or
- › an HLS-NVIS basic (refer MOS 3.05 below for requirements).

A pilot in an NVIS flight must:

- › hold each of the licences, ratings and endorsements required for the NVIS flight under Part 61 (by definition), or
- › be an NVIS trainee pilot undertaking training or testing for an NVIS rating or endorsement provided they are accompanied by an NVIS pilot.

To be clear a trainee pilot must not conduct a solo NVIS flight.

Each air crew member who uses NVIS must be:

- › an NVIS air crew member in an NVIS operation, or
- › a person, otherwise qualified for the NVIS flight, being trained, or tested to become an NVIS air crew member.

**Note** Air crew members may only be carried in accordance with the requirements for NVIS operations.

## HLS-NVIS standard (MOS 3.04)

To meet the HLS-NVIS standard:

- › the HLS-FATO (final approach and take-off area) must:
  - › be capable of enclosing a circle with a diameter equal to one and a half times the D-value ( $1.5 \times D$ ) of the rotorcraft, and
  - › be free of obstacles likely to interfere with the manoeuvring of the rotorcraft, and
  - › incorporate a safety area of  $0.25 \times D$ , or 3 m around the FATO, whichever is larger.
- › the HLS-TLOF (touchdown and lift-off area) must be:
  - › a cleared, and as far as practicable, stable area capable of bearing the dynamic loads which may be imposed by the rotorcraft, and
  - › an area of  $0.83 \times D$ .

For NVIS operations only, the HLS-NVIS standard also includes an HLS that the NVIS operator after conducting a risk assessment has determined, will provide an equivalent level of safety to that which will meet the HLS-FATO and HLS-TLOF criteria above.



*The D-value (D) is the largest overall dimension of the helicopter when rotors are turning.*

## HLS-NVIS basic (MOS 3.05)

A rotorcraft for an NVIS flight must not land on or take off from an HLS-NVIS basic unless it is conducting an NVIS operation.

The NVIS crew must consist of:

- › at least 2 NVIS pilots, or
- › 1 NVIS pilot and at least 1 NVIS air crew member, or
- › 1 NVIS pilot and 1 NVIS trainee pilot, or
- › 1 NVIS pilot, but only if the flight is conducted by an operator who holds a CASA approval based on the applicant's detailed risk assessment.

## No formation flights for NVIS flight (MOS 3.06)

You must not fly in formation with another aircraft during a NVIS flight.

## Alternate lighting requirements (MOS 3.07)

If an NVIS flight is conducted to a planned destination aerodrome that does not have runway or HLS lighting, then you must nominate a destination alternate aerodrome with lighting for the runway or HLS.

This does not apply if it is a NVIS operation and it is conducted by:

- › at least 2 NVIS pilots, or
- › 1 NVIS pilot and 1 NVIS trainee pilot, or
- › 1 NVIS pilot and at least 1 NVIS air crew member.

## Aircraft lighting (MOS 3.08)

Despite other provisions of this MOS, if the optimum performance of the NVIS is affected by, or is likely to be affected by, the aircraft's exterior lighting, you must:

- › turn off the exterior lighting (if there is no risk of collision with another aircraft), or
- › immediately cease the NVIS operation (if there is a risk of collision with another aircraft).

**Note:** On ceasing the relevant NVIS operation, if at a lower altitude, you must immediately climb to at least the minimum altitude for a VFR flight at night, or an IFR flight, conducted without the use of NVIS.

## Minimum height under the NVFR or the IFR for NVIS operations (MOS 3.09)

You may (under CASR 11.160 - granting exemptions), if it is operationally necessary, fly below:

- › the minimum height prescribed for a VFR flight at night (refer 91.277 Minimum heights - VFR at night), and
- › the minimum height prescribed for an IFR flight (refer 91.305 Minimum heights - IFR flights).

For NVIS operations conducted with a minimum of 2 NVIS crew members, the following conditions apply:

- › the flight is an NVIS operation
- › there is an operational necessity to descend below the minimum height
- › you make no request to ATC for any clearance inconsistent with the requirements of this section
- › an NVIS operation conducted under the IFR maintains VMC during flight below the minimum heights listed in 91.277 or 91.305
- › NVIS is used by each NVIS pilot and each NVIS air crew member who is involved in the operation.

For NVIS operations conducted by a **single** NVIS pilot as the only NVIS crew member, the above conditions apply. However, the aircraft must remain at or above 1,000 ft AGL unless:

- › it is operationally necessary, and
- › the aircraft remains at or above 500 ft AGL, and
- › a detailed risk assessment has been provided to CASA, and
- › the operator holds a CASA approval.



| AC 91-13 provides further detail.

If an NVIS operation (other than one flown by a single NVIS pilot as the only NVIS crew member) is conducted below 500 ft AGL in the hover, then, despite any other requirements, you may de-goggle as an individual, or permit any NVIS pilot or air crew member to de-goggle, providing it enhances safety.

You may de-goggle as an individual, or permit all or any NVIS pilot or NVIS air crew member to de-goggle, providing it enhances operational safety when:

- › you are in an NVIS operation (other than one conducted by a single NVIS pilot as the only NVIS crew member), and
- › the performance of the NVIS used is degraded because of extensive illumination in the area being overflown, and
- › the continued use of the NVIS in such circumstances is likely to affect operational safety, and
- › terrain and obstacles in the area may be visually identified and avoided.

## Weather requirements – cloud

### (MOS 3.10)

For an NVIS operation you must comply with:

- › the in-flight cloud requirements set out in table 30 below, or
- › lower in-flight cloud requirements than those provided for in the table below but only if:
  - » operationally necessary, and
  - » the subject of a detailed risk assessment approved by CASA.

**Table 30 – In-flight cloud requirements and conditions**

NVIS aircraft and crew	Kind of NVIS flight for the NVIS operation	Minimum in-flight cloud requirement
NVFR capable, with 2 NVIS crew members (aircraft and crew are NVFR equipped and qualified)	Under the VFR	No more than scattered cloud up to 2,000 ft AGL within 2 NM either side of track.
IFR capable (aircraft and crew are IFR equipped and qualified)	Under the VFR	No more than scattered cloud up to 1,000 ft AGL within 2 NM either side of track
IFR capable (aircraft and crew are IFR equipped and qualified)	Under the IFR below LSALT	No more than scattered cloud up to 1,000 ft AGL within 2 NM either side of track.

If an NVIS operation is NVFR capable but the crew is only a single NVIS pilot, then they must comply with night VFR weather minima.