



Australian Government
Civil Aviation Safety Authority

I, PHILIPPA JILLIAN SPENCE, Director of Aviation Safety, on behalf of CASA, make this instrument under regulations 91.040, 133.020, 138.020 and 201.025 of the *Civil Aviation Safety Regulations 1998*, and section 4 of the *Acts Interpretation Act 1901*.

Pip Spence
Director of Aviation Safety

Date 2021

Part 91, Part 133 and Part 138 Manuals of Standards — NVIS Amendments Instrument 2021 (No. 1)

1 Name of instrument

This instrument is the *Part 91, Part 133 and Part 138 Manuals of Standards — NVIS Amendments Instrument 2021 (No. 1)*.

Note NVIS is short for night vision imaging system.

2 Commencement

This instrument commences on 2 December 2021.

3 Amendment of Part 91 Manual of Standards

Schedule 1 amends *Part 91 (General Operating and Flight Rules) Manual of Standards 2020*.

4 Amendment of Part 133 Manual of Standards

Schedule 2 amends *Part 133 (Australian Air Transport Operations—Rotorcraft) Manual of Standards 2020*.

5 Amendment of Part 138 Manual of Standards

Schedule 3 amends *Part 138 (Aerial Work Operations) Manual of Standards 2020*.

Schedule 1 NVIS Amendments — Part 91 MOS

[1] Subsection 1.07 (6), Definitions and abbreviations

insert

NVIS operation has the meaning given in subsection 3 (1) of this MOS.

[2] Section 2.07, Table 2.07 (3), item 2

repeal and substitute

2	Aircraft	A, B, C, E or G	Below 10 000 ft AMSL	5 000 m	1 500 m horizontal 1 000 ft vertical	
2A	Aircraft	C	Below 10 000 ft AMSL	5 000 m	Clear of cloud	Operations must comply with conditions stated in subsection 2.07 (3A)
2B	Aircraft	Any class	Below 10 000 ft AMSL	5 000 m or less, but not less than 3 000 m. In all cases, only with a relevant CASA approval		Operations must comply with conditions stated in subsections 2.07 (3B) and (3C)

[3] After Table 2.07 (3), including the Notes

insert

- (3A) For item 2A in Table 2.07 (3), the conditions are that the flight must be:
- (a) an NVIS operation; and
 - (b) conducted:
 - (i) by an NVIS operator; or
 - Note* For NVIS operator, see section 3.02.
 - (ii) under the Part 138 MOS by an aerial work certificate holder; or
 - (iii) under the Part 133 MOS by an Australian air transport operator conducting a medical transport operation that is a Part 133 operation; and
 - (c) conducted by at least 2 NVIS crew members authorised (however described) to conduct an NVIS operation by:
 - (i) for an Australian aircraft — Part 61 of CASR; or
 - (ii) for a foreign registered aircraft — the NAA of the State of registry of the aircraft.
- (3B) For item 2B in Table 2.07 (3), the conditions are that the flight must be:
- (a) an NVIS operation; and
 - (b) conducted under Part 138 MOS by an aerial work operator; and
 - (c) conducted by at least 2 NVIS crew members authorised (however described) to conduct an NVIS operation by:
 - (i) for an Australian aircraft — Part 61 of CASR; or
 - (ii) for a foreign registered aircraft — the NAA of the State of registry of the aircraft; and

- (d) for a flight with visibility of 5 000m — one for which the operator holds a CASA approval under regulation 91.045; and
 - (e) for a flight with visibility of less than 5 000m but not less than 3 000 m — one for which the operator holds a CASA approval under paragraph (3C).
- (3C) For paragraph (3B) (e), CASA may approve a minimum in-flight visibility requirement of less than 5 000 m but not less 3 000 m for an NVIS operation in VMC for a particular class of airspace but only if:
- (a) the operation is not NVIS firefighting or NVIS firefighting support; and
 - (b) the operator's application includes a detailed risk assessment; and
 - (c) given the risks, approval (including subject to conditions if required) would not have an adverse effect on aviation safety.

[4] After subsection 2.07 (4)

insert

- (4A) Subsection (1) does not apply to the pilot in command of a rotorcraft in an operation:
- (a) to which Division 5 of Chapter 9 of the Part 138 MOS applies; and
 - (b) which is conducted using NVIS in accordance with Chapter 12 of the Part 138 MOS.

[5] Chapter 3, NVIS Flights

repeal and substitute

Chapter 3 NVIS Flights

Division 1 — Purpose, application and definitions

3.01 Purpose

For subregulation 91.085 (1), this Chapter prescribes requirements relating to an NVIS flight.

Note 1 This Chapter applies to all NVIS flights **except** those conducted by an Australian air transport operator in a Part 133 operation, and those conducted by an aerial work certificate holder in an aerial work operation: see item 1 of Table 91.035 which, in effect, applies regulation 91.085 to all other NVIS flights.

Note 2 This Chapter applies to NVIS flights conducted by a limited aerial work operator mentioned in Part 138: see item 1 of Table 91.035 and regulation 138.350, whose combined effect is to disapply regulation 91.085 from aerial work operations by aerial work certificate holders, but not from limited aerial work operators.

Note 3 For NVIS equipment requirements: see Division 26.17 of the Part 91 MOS. The effect of item 16 of Table 91.035 is that the Division 26.17 requirements apply to all NVIS flights except NVIS flights conducted as a Part 133 operation. The Part 133 MOS contains the equipment requirements for such flights.

3.01A Application

- (1) This Chapter applies to the use of NVIS by a flight crew member of an aircraft in an NVIS flight.
- (2) 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.

3.02 Definitions

(1) In this Chapter and Division 26.17:

contracted recurrent training has the meaning given by regulation 142.020 of CASR.

contracted checking has the meaning given by regulation 142.020 of CASR.

final approach and take-off area, or **FATO**, has the meaning given by the CASR Dictionary.

HLS means helicopter landing site.

HLS-NVIS basic means a HLS that does not conform to the requirement of a HLS-NVIS standard.

HLS-NVIS standard has the meaning given in section 3.04.

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

- (a) the aircraft is equipped for IFR flight in accordance with the regulations; and
- (b) the crew who operate the aircraft meet the relevant requirements for IFR flight under Part 61 of CASR.

IR is short for infra-red.

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

- (a) the aircraft is equipped for flight by night under the VFR in accordance with the regulations; and
- (b) the crew who operate the aircraft meet the relevant requirements for a VFR flight at night under Part 61 of CASR.

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

- (a) of an NVIS operator who holds an AOC, a Part 141 certificate, or an aerial work certificate for the NVIS operation; and
- (b) 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 mentioned in column 2 of item 1 or item 2 in Table 61.1025 of CASR.

NVIS flight has the meaning given by the CASR Dictionary.

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

NVIS operation means an NVIS flight that is any of the following operations using NVIS:

- (a) authorised Part 141 flight training that is for a person to qualify for an NVIS rating or endorsement;
- (b) training and checking for a Part 141 operator in relation to its personnel who carry out the activities mentioned in paragraph (a);
- (c) authorised Part 142 activity that is:
 - (i) authorised Part 142 flight training that is for a person to qualify for an NVIS rating or endorsement;
 - (ii) contracted recurrent training of personnel holding an NVIS rating or endorsement;
 - (iii) contracted checking of personnel holding an NVIS rating or endorsement;

- (d) training and checking for a Part 142 operator in relation to its personnel who carry out the activities mentioned in paragraph (c);
- (e) a flight test required under Part 61 of CASR;
- (f) an NVIS proficiency check under Part 61 of CASR;
- (g) a flight, conducted by a Part 141 operator or a Part 142 operator, for the purpose of ensuring the proficiency of an NVIS pilot;
- (h) 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;
- (i) a maintenance flight of an aircraft for the purpose of ensuring the serviceability of the aircraft, or the NVIS, for NVIS operations mentioned in any other paragraph of this definition;
- (j) a test flight of an aircraft for the purpose of certifying the aircraft, or the NVIS, for NVIS operations mentioned in any other paragraph of this definition.

Note 1 Unless otherwise expressly permitted (for example, under this Chapter, or under the Part 133 or Part 138 MOSs) NVIS must not be used in any other operations for safe air navigation by means of visual surface reference external to the aircraft conducting the operation.

Note 2 This Chapter does not apply to the use of NVIS by any crew member who is not directly involved in air navigation or terrain avoidance functions, and who uses NVIS solely for observation or surveillance.

NVIS operator means the operator for an NVIS operation.

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

- (a) holds each of the licences, ratings and endorsements required for the NVIS flight by Part 61 of CASR; or
- (b) 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.

NVIS proficiency check has the meaning given by regulation 61.010 for night vision imagining system proficiency check.

NVIS rating means a rating mentioned in column 2 of item 4 in Table 61.375 of CASR.

NVIS trainee pilot means a pilot who:

- (a) does not hold an initial NVIS rating under CASR Part 61; and
- (b) is undergoing:
 - (i) an approved course of training by a Part 141 or Part 142 operator, for the issue of such a rating; or
 - (ii) a flight test.

operator has the meaning given by the CASR Dictionary.

Note Operator, of an aircraft, means:

- (a) if the operation of the aircraft is authorised by an AOC, a Part 141 certificate or an aerial work certificate — the holder of the AOC or the certificate; or
- (b) otherwise — the person, organisation or enterprise engaged in aircraft operations involving the aircraft.

Part 141 means Part 141 of CASR.

Part 141 operator has the meaning given by the CASR Dictionary.

Part 142 means Part 142 of CASR.

Part 142 operator has the meaning given by the CASR Dictionary.

safety area means an area:

- (a) that is free of obstacles, other than those:
 - (i) with a height not exceeding 25cm above the surface level of the area; or
 - (ii) that are required for air navigation purposes; and

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

- (b) 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 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.

TLOF is short for touch down and lift of area.

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.

- (2) Subject to subsection (1), in this instrument words and phrases have the same meaning as in CASR.

Division 2 — Requirements for an NVIS flight

3.03 General requirements for NVIS flights

- (1) A rotorcraft in an NVIS flight may only take off from and land on:
 - (a) a HLS-NVIS standard; or
 - (b) subject to section 3.05 — a HLS-NVIS basic.
- (2) A pilot in an NVIS flight must be:
 - (a) an NVIS pilot; or
 - (b) in an NVIS flight that is an NVIS operation for the purpose of flight training or flight testing a pilot (the *NVIS trainee pilot*) for an NVIS rating or endorsement — the NVIS trainee pilot accompanied by an NVIS pilot mentioned in paragraph (a).
- (3) A trainee pilot must not conduct a solo NVIS flight.
- (4) Each air crew member who uses NVIS in an NVIS flight must be:
 - (a) an NVIS air crew member in an NVIS operation; or
 - (b) a person, otherwise qualified for the NVIS flight, who is under flight training or flight testing to become an NVIS air crew member.

Note Aircrew may only be carried in accordance with the requirements for NVIS operations.

3.04 HLS-NVIS standard

- (1) Subject to subsection (2), a HLS-NVIS standard is a HLS that meets all of the following requirements:
 - (a) the FATO must at least:
 - (i) be capable of enclosing a circle with a diameter equal to one-and-a-half times the D-Value (1.5xD) of the rotorcraft; and
 - (ii) be free of obstacles likely to interfere with the manoeuvring of the rotorcraft; and
 - (iii) incorporate a safety area of 0.25 x D, or 3 m around the FATO, whichever is larger; and
 - (b) a TLOF must be at least:

- (i) a cleared and, as far as practicable, stable, area capable of bearing the dynamic loads which may be imposed by the rotorcraft; and
 - (ii) an area of $0.83 \times D$.
- (2) For an NVIS operation only, a HLS-NVIS standard also includes a HLS that meets the FATO and TLOF criteria determined by the NVIS operator through a risk assessment, provided that the FATO and the TLOF so determined will deliver a level of safety that is at least equivalent to that which would otherwise arise from compliance with paragraphs (1) (a) and (1) (b).

3.05 HLS-NVIS basic

- (1) A rotorcraft for an NVIS flight must not land on or take off from a HLS-NVIS basic unless it is conducting an NVIS operation.
- (2) For subsection (1), the NVIS crew must consist of:
 - (a) at least 2 NVIS pilots; or
 - (b) 1 NVIS pilot and at least 1 NVIS air crew member; or
 - (c) 1 NVIS pilot and 1 NVIS trainee pilot; or
 - (d) 1 NVIS pilot, but only if the flight is conducted by an operator who holds a CASA approval under regulation 91.045 that is based on the applicant's detailed risk assessment.

3.06 No formation flights for NVIS flight

The pilot in command of an aircraft for an NVIS flight must not engage in formation flight with another aircraft.

3.07 Alternate lighting requirements

- (1) Subject to subsection (2), if an NVIS flight is conducted to a planned destination aerodrome that does not have runway or HLS lighting then the pilot must nominate a destination alternate aerodrome with lighting for the runway or HLS.
- (2) Subsection (1) does not apply if the NVIS flight is:
 - (a) an NVIS operation; and
 - (b) conducted by:
 - (i) at least 2 NVIS pilots; or
 - (ii) 1 NVIS pilot and 1 NVIS trainee pilot; or
 - (iii) 1 NVIS pilot and at least 1 NVIS air crew member.

Division 3 — Additional requirements for NVIS operations

3.08 Aircraft lighting

If, in an NVIS operation, the optimum performance of the NVIS is affected, or is likely to be affected, by the aircraft's exterior lighting, the pilot in command must:

- (a) if satisfied that there is no risk of collision with another aircraft — turn off the exterior lighting; or
- (b) if satisfied that there is such a risk — immediately cease the NVIS operation.

Note On ceasing the relevant NVIS operation, the pilot in command, if at a lower altitude, 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.

3.09 Minimum height under the NVFR or the IFR for NVIS operations

- (1) The pilot in command of an aircraft for an NVIS operation may, if it is operationally necessary, fly below:
 - (a) for a VFR flight at night — the minimum height prescribed under regulation 91.277; and
 - (b) for an IFR flight — the minimum height prescribed under regulation 91.305.
- (2) Under regulation 11.160 of CASR, the pilot in command of an aircraft for an NVIS operation is exempted from the requirements of regulation 91.277 or 91.305 (as the case requires):
 - (a) on condition that the requirements of this section are complied with; and
 - (b) on condition that the pilot in command makes no request to ATC for any clearance inconsistent with the requirements of this section; and
 - (c) on condition that an NVIS operation conducted under the IFR maintains VMC during flight below the minimum heights referred to in subsection (1); and
 - (d) only in so far as compliance with this section would otherwise be an offence under subregulation 91.277 (4) or 91.305 (4) (as applicable).

Note 1 It is not an offence to fly below the prescribed minimum heights in the circumstances mentioned in subregulation 91.277 (4) or 91.305 (4).

Note 2 This exemption expires 3 years after commencement: see paragraph 11.230 (1) (b) of CASR. Before it expires, Part 91 will be amended to accommodate the rules in this section without recourse to an exemption.

Note 3 The VMC criteria are contained in section 2.07.

- (3) If an NVIS operation is conducted:
 - (a) below the minimum height for a VFR flight at night, as prescribed under regulation 91.277; or
 - (b) below the minimum height for an IFR flight, as prescribed under regulation 91.305;then, NVIS must be used by each NVIS pilot and each NVIS air crew member who is involved in the operation.
- (4) If, for subsection (1), an NVIS operation is conducted by a single NVIS pilot as the only NVIS crew member then, subject to subsection (5), the operation must be conducted at or above 1 000 ft AGL.
- (5) An NVIS operation mentioned in subsection (4) may be conducted below 1 000 ft AGL only if it is:
 - (a) operationally necessary; and
 - (b) conducted at or above 500 ft AGL; and
 - (c) the subject of a detailed risk assessment given to CASA; and
 - (d) conducted by an operator who holds a CASA approval under regulation 91.045.
- (6) If, for subsection (1), an NVIS operation (other than one mentioned in subsection (4)) is conducted below 500 ft AGL in the hover with an NVIS air crew member, then despite any other provision in this Chapter the pilot in command may do any of the following:
 - (a) de-goggle as an individual;
 - (b) permit all or any particular NVIS air crew member to de-goggle;but only if, and for so long as, the de-goggling enhances operational safety.

Note Where the performance of the NVIS is degraded over areas of extensive illumination, and the terrain and obstacles can be visually identified and avoided, the pilot in command may elect to de-goggle either as an individual, or as a crew, in the interests of flight safety.

3.10 Weather requirements — cloud

- (1) The pilot in command of an aircraft for an NVIS operation must comply with one of the following for the operation:
 - (a) the in-flight cloud requirements set out in Table 3.10 (1) of this MOS; or
 - (b) the in-flight cloud requirements approved by CASA under subsection (3).
- (2) For Table 3.10 (1), for an NVIS aircraft and crew mentioned in an item of column 1 of the Table, that is conducting an NVIS operation of a kind mentioned in column 2 of the item, the minimum in-flight cloud requirements are set out in column 3 of the item.

Table 3.10 (1) In-flight cloud requirements

Item	Column 1 NVIS aircraft and crew	Column 2 Kind of NVIS flight for the NVIS operation	Column 3 Minimum in-flight cloud requirement
1	NVFR capable, with 2 NVIS crew members	Under the VFR	No more than scattered cloud up to 2 000 ft AGL within 2 NM either side of track.
2	IFR capable	Under the VFR	No more than scattered cloud up to 1 000 ft AGL within 2 NM either side of track
3	IFR capable	Under the IFR below LSALT	No more than scattered cloud up to 1 000 ft AGL within 2 NM either side of track.

Note NVFR capable and IFR capable are defined in subsection 3.02 (1), Definitions.

- (3) An NVIS operation may comply with in-flight cloud requirements lower than those provided for under paragraph (1) (a) (*reduced in-flight cloud requirements*) but only if the lower requirements are:
 - (a) operationally necessary; and
 - (b) the subject of a detailed risk assessment given to CASA; and
 - (c) approved by CASA under regulation 91.045.
- (4) If:
 - (a) an NVIS operation is NVFR capable; but
 - (b) the NVIS crew is only a single NVIS pilot;
 then the NVIS pilot must comply with night VFR weather minima.

[6] After section 26.73

insert

Division 26.17 — Equipment for NVIS flights

26.74 Purpose

- (1) For subregulation 91.810 (1), this Division prescribes requirements relating to:
 - (a) the fitment and non-fitment of NVIS equipment to an aircraft; and
 - (b) the carrying of NVIS equipment on an aircraft; and
 - (c) NVIS equipment that is fitted to, or carried on, an aircraft.

Note 3 The effect of item 16 of Table 91.035 is that this Division 26.17 applies to all NVIS flights except NVIS flights conducted as a Part 133 operation. The Part 133 MOS contains the equipment requirements for such flights.

26.74A Application

- (1) This Division applies in relation to the use of NVIS by a flight crew member of an aircraft in an NVIS flight.
- (2) This Division does not apply in relation 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.

26.75 Definitions

adverse event means any event or incident in which life or property is:

- (a) lost, injured or damaged in, on or by an aircraft in which NVIS are used; or
- (b) at significant risk of loss or damage in, on or by an aircraft.

Note The following are some examples of significant risks: a near miss; NVIS equipment failure, malfunction or abnormal operation; the failure, malfunction or abnormal operation of NVIS-related or affected equipment; unintentional I.M.C. penetration; inadvertent loss of visibility; abnormal degree or accelerated onset of fatigue.

NVIS certified means that an aircraft has been modified for NVIS flight by one of the following:

- (a) an approval under Part 21 of CASR;
- (b) the type certificate holder under the type certificate;
- (c) a supplemental type certificate.

NVIS compatible lighting means aircraft interior or exterior lighting:

- (a) with spectral wavelength, colour, luminance level and uniformity, that has been modified, or designed, for use with NVIS; and
- (b) that does not degrade or interfere with the image intensification capability performance of the NVIS beyond acceptable standards mentioned in subsection 26.76 (2).

26.76 Aircraft general and lighting standards for NVIS flights

- (1) An aircraft for an NVIS flight must be NVIS certified.

Note NVIS certification means that the aircraft also has NVIS compatible lighting.
- (2) The design of a required aircraft lighting system modification for an NVIS flight must be based on the requirements of:
 - (a) RTCA/DO-275, as in force from time to time); or

- (b) MIL-STD-3009, Lighting, Aircraft, NVIS Compatible, of the US Department of Defense, as in force from time to time).

26.77 Performance and other specifications for NVG image intensifier tubes

- (1) NVG image intensifier tubes for an NVIS flight must meet the minimum operational performance specification that is:
 - (a) defined in RTCA/DO 275, as in force from time to time, as modified in accordance with subsection (5); or
 - (b) approved in writing by CASA as equivalent to that under paragraph (a) in terms of tube resolution, system resolution, system luminance gain, photosensitivity and signal to noise ratio.
- (2) Each NVG image intensifier tube and associated NVIS equipment (the *NVG tubes and equipment*) must be:
 - (a) certified by its manufacturer as being for aviation use; and
 - (b) identified by the manufacturer's unique serial number; and
 - (c) acquired (with or without valuable consideration) by the aircraft operator directly from:
 - (i) the manufacturer or the manufacturer's official supplier (an *official source*); or
 - (ii) a person who acquired it directly from an official source (the *initial acquirer*); or
 - (iii) a person who acquired it as the first or later acquirer in a line of direct and provable acquisitions originating from the initial acquirer (a *subsequent acquirer*); and

Note 1 In this subsection, "acquired (with or without valuable consideration)" refers to, for example, an acquisition through a purchase or a donation or in any other way.

Note 2 CASA considers the source of second-hand NVG tubes and equipment to be a matter that may affect safety.

- (d) in the case of replacement of NVG image intensifier tubes with tubes that are sourced from other than an official source — as follows:
 - (i) replaced as a pair;
 - (ii) of the same form, fit and function as the tubes being replaced;
 - (iii) such that the replacement does not involve modification of the NVIS mounting frame or optical components;
 - (iv) compliant with paragraph (1) (a).

Note For guidance only, US AN/AVS 9 NVIS, although manufactured by different manufacturers, are produced to the same US Department of Defense specification and, therefore, these tubes are interchangeable.

- (3) If 2 or more NVIS pilots on an NVIS flight use dissimilar NVG image intensifier tubes and equipment, the pilot in command must use the highest level of NVIS tubes and equipment in terms of resolution, gain and acuity.

Note Use of dissimilar NVIS does not remove the requirement that the minimum standard of any set used must be in accordance with subsections (1) and (2).
- (4) An NVIS pilot who occupies a control seat of an aircraft during an NVIS flight must use the NVIS manufacturer's approved helmet mounted attachment device for the NVIS.

- (5) For paragraph (1) (a), column 3 of each item of Table 26.77 (5) (a) shows how a relevant operational performance specification in the paragraph of RTCA/DO-275 mentioned in column 1 of the item, and summarised (if any) in column 2 of the item, is modified.

Table 26.77 (5) Modifications of RTCA/DO 275

	Column 1	Column 2	Column 3
Item	RTCA/DO-275 (as in force from time to time)	Summary	Amended performance requirement
1	Para 2.2.1.1 System Resolution	1.0 cycles per milliradian (cy/mr). At 14° off axis = 0.81 cy/mr With a variable focus @ through infinity = 0.49cy/mr	1.3 cy/mr
2	Para 2.2.1.2 System Luminance Gain – Filmed non- autogating	= 2 500 foot-Lamberts (fL) per fL at an input light level of 1×10^{-4} fL	= 5 500 foot-Lamberts (fL) per fL at an input light level of 1×10^{-4} fL = 1750 cd/m ² /lx at an input light level of 1.1×10^{-3} lx
3	System Luminance Gain – Filmless autogating		=16 000 cd/m ² /lx at an input light level of 2×10^{-5} lx
4	Para 2.2.1.3 Field-of-View	38° vertical and horizontal	40°
5	Para 2.2.1.4 Magnification	1:1 +/- 2%	1:1
6	Para 2.2.1.7.1 Spectral Transmission	Meet Class B filter requirements	Class B filter
7	Para 2.2.1.10 Eyepiece Diopter Range	Adjustable +1.0 to -2.0, or Fixed -0.5 and -1.0	+2 to -6
8	Para 2.2.1.12 Objective Focus Range	Adjustable from beyond infinity to no greater than 45 cm close range	25 cm close
9	Para 2.2.13 Exit Pupil/Eye Relief	Type I – 25 mm, Type II – 20mm	25 mm
10	Para 2.2.2.3 Flip- Up/Flip Down	Required capability	Push button
11	Para 2.2.2.4 Fore- and-Aft Adjustment	Sufficient to align with users’ eyes	27 mm total
12	Para 2.2.2.4 Tilt Adjustment	Sufficient to align with users’ eyes	10°

	Column 1	Column 2	Column 3
Item	RTCA/DO-275 (as in force from time to time)	Summary	Amended performance requirement
13	Para 2.2.2.5 Interpupillary Adjustment	Desired but not required. If not installed, exit pupil must be large enough to see full FOV	51 to 72 mm
14	Para 2.2.2.6 Voltage Required	2.7 – 3.0 V DC 50mA nominal Backup power supply required	2.7 – 3.0 V DC 50mA nominal Backup available
15	Technology	Intensifier tubes not specified	Not specified
16	Photosensitivity filmed non- autogating	Not specified	1 800 μ A/lm
17	Photosensitivity filmless autogating		800 μ A/lm
18	Tube Resolution	Not specified	64 line pairs per millimetre (lp/mm)
19	Signal to Noise Ratio Filmed non- autogating	Not specified	21:1
20	Signal to Noise Ratio Filmless Autogating		25:1

26.78 Maintenance of the NVIS and its components

- (1) For an NVIS flight, the NVIS equipment must be maintained, stored, and checked for serviceability, in accordance with the manufacturer's requirements and procedures.
- (2) NVIS equipment must have a documented maintenance program to ensure that:
 - (a) maintenance, inspection, and serviceability standards for the NVIS are met; and
 - (b) a biennial assessment is made to identify and rectify any degradation in the compatibility of the aircraft lighting systems with the NVIS.

Note RTCA/DO-275 (as in force from time to time) provides guidance for the ongoing maintenance of installed NVIS compatible systems.

- (3) The maintenance program must include a method for assessing NVIS compatibility with any subsequent aircraft modification, equipment introduction or repair that may have an effect on the aircraft's NVIS compatibility.
- (4) Any item of equipment other than NVIS equipment, that is fitted to, or carried on, the aircraft must not at any time adversely affect the safe operation of the aircraft in an NVIS flight.
- (5) Maintenance of NVIS must be carried out by an organisation that:
 - (a) complies with regulation 30 of CAR or Part 145 of CASR as if the regulation or the Part applied to the organisation for the maintenance of NVIS and its related equipment; and
 - (b) is endorsed in writing by the manufacturer of the NVIS as an appropriate organisation to carry out maintenance on the NVIS.

- (6) To avoid doubt, for subsection (5), maintenance includes routine scheduled servicing of NVIS.
- (7) An organisation endorsed by a manufacturer under paragraph (5) (b) for any particular NVIS manufactured in the United States (the *US*) that complies with the specification mentioned in paragraph 26.77 (1) (a) is taken to be endorsed for any other NVIS that:
 - (a) is manufactured in the US and is available in Australia; and
 - (b) complies with the specification mentioned in paragraph 26.77 (1) (a).

Note This provision is to ensure that an endorsement given to an organisation by an original US manufacturer of paragraph 26.77 (1) (a)-compliant NVIS, is taken to be an endorsement for any other US manufactured NVIS available in Australia that complies with paragraph 26.77 (1) (a).

- (8) If:
 - (a) 1 or more image intensification tubes (tubes) fail for any reason during an NVIS flight; or
 - (b) 1 or more tubes fail at any time as a result of a suspected error in maintenance; then the operator must, within 28 days of the failure, report the failure to CASA through the Service Difficulty Reporting System using ATA Code 2590.
- (9) For paragraph (5) (b):

manufacturer means the person who is:

 - (a) the original manufacturer of the NVIS; or
 - (b) the original manufacturer of the NVG image intensification tubes fitted to the NVIS; or
 - (c) if parts of the NVIS are manufactured by different persons — the person who makes the final assembly of the parts into the NVIS.

26.79 Minimum aircraft equipment for NVIS flight

- (1) Subject to subsection (2), before an NVIS flight, the aircraft must be fitted with a serviceable radio altimeter that:
 - (a) conforms to the following requirements:
 - (i) it must have a display presentation that requires minimal interpretation for both an instantaneous impression of absolute height and rate of change of height;
 - (ii) it must be positioned to be instantly visible and discernible to each NVIS crew member from the person's station in the cockpit;
 - (iii) it must have an integral audio and visual low height warning that operates at a height selectable by the pilot;
 - (iv) it must provide unambiguous warning to each NVIS crew member of radio altimeter failure; and
 - (b) has a visual warning system that provides clear visual warning at each cockpit crew station of height below the pilot-selectable height; and
 - (c) has an audio warning system that:
 - (i) is unambiguous and readily cancellable;
 - (ii) when cancelled — does not extinguish any visual low height warnings; and
 - (iii) operates at the same pilot-selectable height as the visual warning.
- (2) CASA may approve an alternative visual and audio warning system that must be fitted to an aircraft before an operation, but only if the system produces warnings at least equivalent to those mentioned in paragraphs (1) (b) and (1) (c).

- (3) A rotorcraft for an NVIS operation must be fitted with a serviceable pilot-steerable searchlight, adjustable in both pitch and azimuth from the flight controls.
- (4) Before an NVIS operation, the operator and the pilot in command must be satisfied that:
 - (a) in an NVIS operation below 500 ft AGL; or
 - (b) in an NVIS operation from a HLS-NVIS basic using a searchlight with an NVIS compatible IR filter;

the risk of an adverse event as a result of NVIS failure below 500 ft AGL is controlled by:

- (c) the aircraft's capacity to revert immediately to a non-filtered search or landing light; or
- (d) the presence of 2 pilots, each of whom:
 - (i) is NVIS qualified and NVIS equipped; and
 - (ii) has access to dual flight controls.

Schedule 2 NVIS Amendments — Part 133 MOS

[2] Subsection 1.04 (2), Definitions and abbreviations

insert

NVIS operation has the meaning given in subsection 8.02 (1) of this MOS.

[2] Paragraph 5.10 (3) (i)

repeal and substitute

- (i) for night operations — the flight must be conducted in accordance with the requirements under this MOS for an NVIS operation.

[3] After Chapter 7

insert

Chapter 7A — Head-up display, enhanced vision system, and synthetic vision system

7A.01 Requirements for use of head-up display, enhanced vision system and synthetic vision system

RESERVED

Note Subregulation 133.255 of CASR permits the Part 133 MOS to prescribe requirements for the use of a head up display, enhanced vision system or synthetic vision system for a flight of a rotorcraft. This section has been reserved for any future provisions that would be appropriate following consultation.

[4] Chapter 8

repeal and substitute

Chapter 8 — NVIS flight

Division 1 — Purpose, application and definitions

8.01 Purpose

For subregulation 133.265 (3), this Chapter prescribes requirements for the use of an NVIS for a flight of a rotorcraft.

8.01A Application

- (1) This Chapter applies in relation to the use of NVIS by a flight crew member of an aircraft in an NVIS flight.
- (2) This Chapter does not apply in relation 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.

8.02 Definitions

- (1) In this Chapter:

final approach and take-off area, or *FATO*, has the meaning given by the CASR Dictionary.

HLS means helicopter landing site.

HLS-NVIS basic means a HLS that does not conform to the requirement of a HLS-NVIS standard.

HLS-NVIS standard has the meaning given in section 8.05.

IFR capable, for a rotorcraft, describes a circumstance in which the rotorcraft is:

- (a) equipped for IFR flight in accordance with the regulations; and
- (b) operated by a crew who meet the relevant requirements for IFR flight under Part 61 of CASR.

MOS is short for Manual of Standards.

NVFR capable, for a rotorcraft, describes a circumstance in which the rotorcraft is:

- (a) equipped for flight at night under the VFR in accordance with the regulations; and
- (b) operated by a crew each member of which meets the relevant requirements for a VFR flight by night under Part 61 of CASR.

NVIS is short for night vision imaging system.

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

- (a) of an NVIS operator who holds an AOC for the NVIS operation; and
- (b) 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 Chapter.

NVIS crew member means an NVIS pilot or an NVIS air crew member.

NVIS endorsement means an endorsement mentioned in column 2 of item 1 or item 2 in Table 61.1025 of CASR.

NVIS flight has the meaning given by the CASR Dictionary.

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

NVIS operation means an NVIS flight that is a medical transport operation.

NVIS operator means the operator for an NVIS operation.

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

- (a) holds each of the licences, ratings and endorsements required for the NVIS flight by Part 61 of CASR; or
- (b) if the rotorcraft is a foreign registered rotorcraft — is authorised by the rotorcraft's State of registry to pilot the rotorcraft for the NVIS flight.

NVIS proficiency check has the meaning given by regulation 61.010 for night vision imaging system proficiency check.

NVIS rating means a rating mentioned in column 2 of item 4 in Table 61.375 of CASR.

operator has the meaning given by the CASR Dictionary.

Note Operator, of a rotorcraft, means:

- (a) if the operation of the rotorcraft is authorised by an AOC, a Part 141 certificate or an aerial work certificate — the holder of the AOC or the certificate; or
- (b) otherwise — the person, organisation or enterprise engaged in rotorcraft operations involving the rotorcraft.

safety area means an area:

- (a) that is free of obstacles, other than those:
 - (i) with a height not exceeding 25cm above the surface level of the area; or
 - (ii) that are required for air navigation purposes; and

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

- (b) whose purpose is to reduce the risk of damage to a rotorcraft if it accidentally diverges from the load-bearing area primarily intended for landing or take-off.

Note 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.

used, using or uses, in relation to the use of NVIS, means used as the primary means of terrain avoidance for safe air navigation by means of visual surface reference external to the rotorcraft conducting the operation.

- (2) Subject to subsection (1), in this instrument words and phrases have the same meaning as in CASR.

Division 2 — Requirements for an NVIS flight

8.03 General requirements for NVIS flights

- (1) A rotorcraft in an NVIS flight may only take off from and land on:
 - (a) a HLS-NVIS standard; or
 - (b) subject to section 8.05 — a HLS-NVIS basic.
- (2) A pilot in an NVIS flight must be an NVIS pilot.
- (3) Each air crew member who uses NVIS in an NVIS flight must be:
 - (a) an NVIS air crew member; or
 - (b) a person, otherwise qualified for the flight, who is under flight training or flight testing to become an NVIS air crew member.

8.04 HLS-NVIS standard

- (1) Subject to subsection (2), a HLS-NVIS standard is a HLS that meets all of the following requirements:
 - (a) the FATO must at least:

- (i) be capable of enclosing a circle with a diameter equal to one-and-a-half times the D-Value (1.5xD) of the rotorcraft; and
 - (ii) be free of obstacles likely to interfere with the manoeuvring of the rotorcraft; and
 - (iii) incorporate a safety area of 0.25 x D, or 3 m around the FATO, whichever is larger; and
- (b) a TLOF must be at least:
- (i) a cleared and stable area capable of bearing the dynamic loads which may be imposed by the rotorcraft; and
 - (ii) an area of 0.83 x D.
- (2) For an NVIS operation only, a HLS-NVIS standard also includes a HLS that meets the FATO and TLOF criteria determined by the NVIS operator through a risk assessment, provided that the FATO and the TLOF so determined will deliver a level of safety that is at least equivalent to that which would otherwise arise from compliance with paragraphs (1) (a) and (1) (b).

8.05 HLS-NVIS basic

- (1) A rotorcraft for an NVIS flight must not land on or take off from a HLS-NVIS basic except in the course of an NVIS operation.
- (2) For subsection (1), the NVIS crew must consist of:
 - (a) at least 2 NVIS pilots; or
 - (b) 1 NVIS pilot and at least 1 NVIS air crew member; or
 - (c) 1 NVIS pilot, but only if, based on the applicant's detailed risk assessment, CASA grants an approval in writing subject to conditions (if any).
 - (c) 1 NVIS pilot, but only if the flight is conducted by an operator who holds a CASA approval under regulation 133.015 that is based on the applicant's detailed risk assessment.

8.06 No formation flights for NVIS flights

The pilot in command of an aircraft for an NVIS flight must not engage in formation flight with another aircraft.

8.07 Alternate lighting requirements for NVIS flights

- (1) Subject to subsection (2), if an NVIS flight is conducted to a planned destination aerodrome that does not have runway or HLS lighting then the pilot must nominate a destination alternate aerodrome with lighting for the runway or HLS.
- (2) Subsection (1) does not apply if the NVIS flight is:
 - (a) an NVIS operation; and
 - (b) conducted by:
 - (i) at least 2 NVIS pilots; or
 - (ii) 1 NVIS pilot and 1 NVIS trainee pilot; or
 - (iii) 1 NVIS pilot and at least 1 NVIS air crew member.

Division 3 — Additional requirements for NVIS operations

Note An NVIS operation means an NVIS flight that is a medical transport operation – see subsection 8.02 (1).

8.08 Helicopter lighting

If, in an NVIS operation, the optimum performance of the NVIS is affected, or is likely to be affected, by the rotorcraft's exterior lighting, the pilot in command must:

- (a) if satisfied that there is no risk of collision with another aircraft — turn off the exterior lighting; or
- (b) if satisfied that there is such a risk — immediately cease the NVIS operation.

Note On ceasing the relevant NVIS operation, the pilot in command, if at a lower altitude, 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.

8.09 Minimum height under the NVFR or the IFR

Note Section 5.10 in Division 2 of Chapter 5 of this MOS outlines the requirements for helicopter IFR flight and VFR flight at night below the minimum height.

- (1) If an NVIS operation is conducted at a height below that prescribed under regulation 91.277 or 91.305 (as applicable to the flight), then NVIS must be used by each NVIS pilot and each NVIS air crew member who is involved in the operation.
- (2) If a single NVIS pilot is the only NVIS crew member in an NVIS operation, then, subject to subsection (3), the operation must be conducted at or above 1 000 ft AGL (except for manoeuvres necessary for take-off and landing).
- (3) Except for manoeuvres necessary for take-off and landing, an NVIS operation mentioned in subsection (2) may be conducted below 1 000 ft AGL only if it is:
 - (a) operationally necessary; and
 - (b) not conducted below 500 ft AGL; and
 - (c) the subject of the operator's detailed risk assessment given to CASA; and
 - (d) conducted by an AOC holder who holds a CASA approval for the operation under regulation 133.015, that is based on the risk assessment.
- (4) If an NVIS operation (other than one mentioned in subsection (2)) is conducted in the hover then despite any other provision in this Chapter, the pilot in command may do any of the following:
 - (a) de-goggle as an individual;
 - (b) permit all or any particular NVIS air crew member to de-goggle;but only if, and for so long as, the de-goggling enhances operational safety.

Note Where the performance of the NVIS is degraded over areas of extensive illumination, and the terrain and obstacles can be visually identified and avoided, the pilot in command may elect to de-goggle either as an individual, or as a crew, in the interests of flight safety.

8.10 Weather requirements — cloud

- (1) The pilot in command of a rotorcraft for an NVIS operation must comply with one of the following for the operation:
 - (a) the in-flight cloud requirements set out in Table 8.09 (1) of this MOS; or
 - (b) the in-flight cloud requirements approved by CASA under subsection (3).
- (2) For Table 8.09 (1), for an NVIS helicopter and crew mentioned in an item of column 1 of the Table, that is conducting an NVIS operation of a kind mentioned in column 2 of the item, the minimum in-flight cloud requirements are set out in column 3 of the item.

Table 8.09 (1) In-flight cloud requirements

Item	Column 1	Column 2	Column 3
------	----------	----------	----------

	NVIS rotorcraft and crew	Kind of NVIS operation	Minimum in-flight cloud requirement
1	NVFR capable with 2 NVIS crew members	Under the VFR	No more than scattered cloud up to 2 000 ft AGL within 2 NM either side of track.
2	IFR capable	Under the VFR	No more than scattered cloud up to 1 000 ft AGL within 2 NM either side of track
3	IFR capable	Under the IFR below LSALT	No more than scattered cloud up to 1 000 ft AGL within 2 NM either side of track.

Note NVFR capable and IFR capable are defined in subsection 8.03, Definitions.

- (3) An NVIS operation may comply with in-flight cloud requirements lower than those provided for under paragraph (1) (a) (***reduced in-flight cloud requirements***) but only if the lower requirements are:
- (a) operationally necessary; and
 - (b) the subject of a detailed risk assessment given to CASA; and
 - (c) the AOC operator holds a CASA approval under regulation 133.015.
- (4) If:
- (a) an NVIS operation is NVFR capable; but
 - (b) the NVIS crew is only a single NVIS pilot;
- then the NVIS pilot must comply with night VFR weather minima.

[5] Paragraph 10.32 (6) (b)

omit

using NVIS,

insert

as an NVIS flight,

[6] Paragraph 10.32 (6) (e)

omit

using NVIS,

insert

if the flight is an NVIS flight,

[7] After section 11.58

insert

Division 14 — Equipment for NVIS flights

11.59 Purpose

- (1) For subregulation 133.360, this Division prescribes requirements relating to:
 - (a) the fitment and non-fitment of NVIS equipment to a rotorcraft; and
 - (b) the carrying of NVIS equipment on a rotorcraft; and
 - (c) NVIS equipment that is fitted to, or carried on, a rotorcraft.

11.59A Application

- (1) This Division applies in relation to the use of NVIS by a flight crew member of an aircraft in an NVIS flight.
- (2) This Division does not apply in relation 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.

11.60 Definitions

adverse event means any event or incident in which life or property is:

- (a) lost, injured or damaged in, on or by a rotorcraft in which NVIS are used; or
- (b) at significant risk of loss or damage in, on or by a rotorcraft.

Note The following are some examples of significant risks: a near miss; NVIS equipment failure, malfunction or abnormal operation; the failure, malfunction or abnormal operation of NVIS-related or affected equipment; unintentional I.M.C. penetration; inadvertent loss of visibility; abnormal degree or accelerated onset of fatigue.

NVIS certified means that a rotorcraft has been modified for NVIS operations by one of the following:

- (a) an approval under Part 21 of CASR;
- (b) the type certificate holder under the type certificate;
- (c) a supplemental type certificate.

NVIS compatible lighting means rotorcraft interior or exterior lighting:

- (a) with spectral wavelength, colour, luminance level and uniformity, that has been modified, or designed, for use with NVIS; and
- (b) that does not degrade or interfere with the image intensification capability performance of the NVIS beyond acceptable standards mentioned in subsection 11.61 (2).

11.61 General and lighting standards for NVIS flights

- (1) A rotorcraft for an NVIS flight must be NVIS certified.
Note NVIS certification means that the rotorcraft also has NVIS compatible lighting.
- (2) The design of a required aircraft lighting system modification for an NVIS flight must be based on the requirements of:
 - (a) RTCA/DO-275, as in force from time to time); or
 - (b) MIL-STD-3009, Lighting, Aircraft, NVIS Compatible, of the US Department of Defense, as in force from time to time).

11.62 Performance and other specifications for NVG image intensifier tubes

- (1) NVG image intensifier tubes for an NVIS flight must meet the minimum operational performance specification that is:
 - (a) defined in RTCA/DO 275, as in force from time to time, as modified in accordance with subsection (5); or
 - (b) approved in writing by CASA as equivalent to that under paragraph (a) in terms of tube resolution, system resolution, system luminance gain, photosensitivity and signal to noise ratio.
- (2) Each NVG image intensifier tube and associated NVIS equipment (the *NVG tubes and equipment*) must be:
 - (a) certified by its manufacturer as being for aviation use; and
 - (b) identified by the manufacturer's unique serial number; and
 - (c) acquired (with or without valuable consideration) by the rotorcraft operator directly from:
 - (i) the manufacturer or the manufacturer's official supplier (an *official source*); or
 - (ii) a person who acquired it directly from an official source (the *initial acquirer*); or
 - (iii) a person who acquired it as the first or later acquirer in a line of direct and provable acquisitions originating from the initial acquirer (a *subsequent acquirer*); and

Note 1 In this subsection, "acquired (with or without valuable consideration)" refers to, for example, an acquisition through a purchase or a donation or in any other way.

Note 2 CASA considers the source of second-hand NVG tubes and equipment to be a matter that may affect safety.

- (d) in the case of replacement of NVG image intensifier tubes with tubes that are sourced from other than an official source — as follows:
 - (i) replaced as a pair;
 - (ii) of the same form, fit and function as the tubes being replaced;
 - (iii) such that the replacement does not involve modification of the NVIS mounting frame or optical components;
 - (iv) compliant with paragraph (1) (a).

Note For guidance only, US AN/AVS 9 NVIS, although manufactured by different manufacturers, are produced to the same US Department of Defense specification and, therefore, these tubes are interchangeable.

- (3) If 2 or more NVIS pilots on an NVIS flight use dissimilar NVG image intensifier tubes and equipment, the pilot in command must use the highest level of NVIS tubes and equipment in terms of resolution, gain and acuity.

Note Use of dissimilar NVIS does not remove the requirement that the minimum standard of any set used must be in accordance with subsections (1) and (2).

- (4) An NVIS pilot who occupies a control seat of a rotorcraft during an NVIS operation must use the NVIS manufacturer's approved helmet mounted attachment device for the NVIS.
- (5) For paragraph (1) (a), column 3 of each item of Table 11.62 (5) (a) shows how a relevant operational performance specification in the paragraph of RTCA/DO-275 mentioned in column 1 of the item, and summarised (if any) in column 2 of the item, is modified.

Table 11.62 Modifications of RTCA/DO 275

	Column 1	Column 2	Column 3
Item	RTCA/DO-275 (as in force from time to time)	Summary	Amended performance requirement
1	Para 2.2.1.1 System Resolution	1.0 cycles per milliradian (cy/mr). At 14° off axis = 0.81 cy/mr With a variable focus @ through infinity = 0.49cy/mr	1.3 cy/mr
2	Para 2.2.1.2 System Luminance Gain – Filmed non- autogating	= 2 500 foot-Lamberts (fL) per fL at an input light level of 1×10^{-4} fL	= 5 500 foot-Lamberts (fL) per fL at an input light level of 1×10^{-4} fL = 1750 cd/m ² /lx at an input light level of 1.1×10^{-3} lx
3	System Luminance Gain – Filmless autogating		=16 000 cd/m ² /lx at an input light level of 2×10^{-5} lx
4	Para 2.2.1.3 Field-of-View	38° vertical and horizontal	40°
5	Para 2.2.1.4 Magnification	1:1 +/- 2%	1:1
6	Para 2.2.1.7.1 Spectral Transmission	Meet Class B filter requirements	Class B filter
7	Para 2.2.1.10 Eyepiece Diopter Range	Adjustable +1.0 to -2.0, or Fixed -0.5 and -1.0	+2 to -6
8	Para 2.2.1.12 Objective Focus Range	Adjustable from beyond infinity to no greater than 45 cm close range	25 cm close

	Column 1	Column 2	Column 3
Item	RTCA/DO-275 (as in force from time to time)	Summary	Amended performance requirement
9	Para 2.2.13 Exit Pupil/Eye Relief	Type I – 25 mm, Type II – 20mm	25 mm
10	Para 2.2.2.3 Flip-Up/Flip Down	Required capability	Push button
11	Para 2.2.2.4 Fore-and-Aft Adjustment	Sufficient to align with users' eyes	27 mm total
12	Para 2.2.2.4 Tilt Adjustment	Sufficient to align with users' eyes	10°
13	Para 2.2.2.5 Interpupillary Adjustment	Desired but not required. If not installed, exit pupil must be large enough to see full FOV	51 to 72 mm
14	Para 2.2.2.6 Voltage Required	2.7 – 3.0 V DC 50mA nominal Backup power supply required	2.7 – 3.0 V DC 50mA nominal Backup available
15	Technology	Intensifier tubes not specified	Not specified
16	Photosensitivity filmed non-autogating	Not specified	1 800 µA/lm
17	Photosensitivity filmless autogating		800 µA/lm
18	Tube Resolution	Not specified	64 line pairs per millimetre (lp/mm)
19	Signal to Noise Ratio Filmed non-autogating	Not specified	21:1
20	Signal to Noise Ratio Filmless Autogating		25:1

11.63 Maintenance of the NVIS and its components

- (1) For an NVIS flight, the NVIS equipment must be maintained, stored, and checked for serviceability, in accordance with the manufacturer's requirements and procedures.
- (2) NVIS equipment must have a documented maintenance program to ensure that:
 - (a) maintenance, inspection, and serviceability standards for the NVIS are met; and
 - (b) a biennial assessment is made to identify and rectify any degradation in the compatibility of a rotorcraft's lighting systems with the NVIS.

Note RTCA/DO-275 (as in force from time to time) provides guidance for the ongoing maintenance of installed NVIS compatible systems.

- (3) The maintenance program must include a method for assessing NVIS compatibility with any subsequent rotorcraft modification, equipment introduction or repair that may have an effect on the rotorcraft's NVIS compatibility.

- (4) Any item of equipment other than NVIS equipment, that is fitted to, or carried on, the rotorcraft must not at any time adversely affect the safe operation of the rotorcraft in an NVIS operation.
- (5) Maintenance of NVIS must be carried out by an organisation that:
 - (a) complies with regulation 30 of CAR or Part 145 of CASR as if the regulation or the Part applied to the organisation for the maintenance of NVIS and its related equipment; and
 - (b) is endorsed in writing by the manufacturer of the NVIS as an appropriate organisation to carry out maintenance on the NVIS.
- (6) To avoid doubt, for subsection (5), maintenance includes routine scheduled servicing of NVIS.
- (7) An organisation endorsed by a manufacturer under paragraph (5) (b) for any particular NVIS manufactured in the United States (the *US*) that complies with the specification mentioned in paragraph 11.62 (1) (a) is taken to be endorsed for any other NVIS that:
 - (a) is manufactured in the US and is available in Australia; and
 - (b) complies with the specification mentioned in paragraph 11.62 (1) (a).

Note This provision is to ensure that an endorsement given to an organisation by an original US manufacturer of paragraph 11.62 (1) (a)-compliant NVIS, is taken to be an endorsement for any other US manufactured NVIS available in Australia that complies with paragraph 11.62 (1) (a).
- (8) If:
 - (a) 1 or more image intensification tubes (tubes) fail for any reason during an NVIS operation; or
 - (b) 1 or more tubes fail at any time as a result of a suspected error in maintenance; then the operator must, within 28 days of the failure, report the failure to CASA through the Service Difficulty Reporting System using ATA Code 2590.
- (9) For paragraph (5) (b):

manufacturer means the person who is:

 - (a) the original manufacturer of the NVIS; or
 - (b) the original manufacturer of the NVG image intensification tubes fitted to the NVIS; or
 - (c) if parts of the NVIS are manufactured by different persons — the person who makes the final assembly of the parts into the NVIS.

11.64 Minimum equipment for NVIS flight

- (1) Subject to subsection (2), before an NVIS flight, the rotorcraft must be fitted with a serviceable radio altimeter that:
 - (a) conforms to the following requirements:
 - (i) it must have a presentation that requires minimal interpretation for both an instantaneous impression of absolute height and rate of change of height;
 - (ii) it must be positioned to be instantly visible and discernible to each NVIS crew member from the person's station in the cockpit;
 - (iii) it must have an integral audio and visual low height warning that operates at a height selectable by the pilot;
 - (iv) it must provide unambiguous warning to each NVIS crew member of radio altimeter failure; and

- (b) has a visual warning system that provides clear visual warning at each cockpit crew station of height below the pilot-selectable height; and
- (c) has an audio warning system that:
 - (i) is unambiguous and readily cancellable;
 - (ii) when cancelled — does not extinguish any visual low height warnings; and
 - (iii) operates at the same pilot-selectable height as the visual warning.
- (2) CASA may approve an alternative visual and audio warning system that must be fitted to a rotorcraft before an operation, but only if the system produces warnings at least equivalent to those mentioned in paragraphs (1) (b) and (1) (c).
- (3) Before an NVIS flight, the rotorcraft must be fitted with a serviceable pilot-steerable searchlight, adjustable in both pitch and azimuth from the flight controls.
- (4) Before an NVIS flight, the operator and the pilot in command must be satisfied that:
 - (a) in an NVIS operation below 500 ft AGL; or
 - (b) in an NVIS operation from a HLS-NVIS basic using a searchlight with an NVIS compatible IR filter;
 the risk of an adverse event as a result of NVIS failure below 500 ft AGL is controlled by:
 - (c) the rotorcraft's capacity to revert immediately to a non-filtered search or landing light; or
 - (d) the presence of 2 pilots, each of whom:
 - (i) is NVIS qualified and NVIS equipped; and
 - (ii) has access to dual flight controls.

Schedule 3 NVIS Amendments — Part 138 MOS

[1] Section 1.04, Definitions etc.

insert

ATSO (short for Australian Technical Standard Order) has the meaning given by Part 1 of the CASR Dictionary.

ETSO is short for European Technical Standard Order: see the CASR Dictionary.

(E)TSO, followed by an identifying letter and number, is a shorthand reference to both the TSO and the ETSO, each of which has the same identifying letter and number.

national aviation authority or *NAA* has the meaning given in the CASR Dictionary.

NVIS air crew member has the same meaning as in Chapter 12 of this MOS.

NVIS firebombing has the same meaning as in Chapter 12 of this MOS.

NVIS fire mapping has the same meaning as in Chapter 12 of this MOS.

NVIS incendiary dropping has the same meaning as in Chapter 12 of this MOS.

NVIS pilot has the same meaning as in Chapter 12 of this MOS.

TSO is short for Technical Standard Order of the FAA: see the CASR Dictionary.

[2] Section 1.04, Definitions etc., definition of CAO 82.6

repeal

- [3] **Section 1.04, Definitions etc., definition of NVIS operation**
repeal and substitute
NVIS operation has the same meaning as in Chapter 12 of this MOS.
- [4] **Section 1.04, Definitions etc., definition of NVIS qualified crew**
repeal
- [5] **Paragraph 4.02 (1) (c)**
repeal and substitute
(c) an operation for the purposes of training and checking air crew members under Chapter 24 of this MOS;
(d) an operation that is an NVIS operation.
- [6] **Paragraph 9.02 (2) (b)**
repeal and substitute
(b) for a positioning flight using NVIS and conducted under Chapter 12 of this MOS — the minimum height requirements under regulation 91.265 or 91.267, as the case requires.
- [7] **Paragraph 9.04 (2) (h)**
repeal and substitute
(h) for night operations — the flight must be conducted in accordance with the requirements for an NVIS operation;
- [8] **After subsection 9.14 (3)**
insert
(3A) The flight may be conducted using NVIS in accordance with Chapter 12 of this MOS.
Note See also the definition of *NVIS operation* and subsection 12.11 (5).
- [9] **Subsections 11.01 (2) and (3)**
repeal
- [10] **Subparagraph 11.03 (1) (d) (i)**
repeal and substitute
(i) the flight is conducted in accordance with the requirements for an NVIS operation; and
- [11] **Subparagraph 11.03 (1) (d) (ii)**
repeal
- [12] **Section 12.01 and 12.02**
repeal and substitute

Division 1 — Purpose, application and definitions

12.01 Purpose

For subregulation 138.350 (3), this Chapter prescribes requirements relating to an NVIS flight.

12.02 Application

- (1) This Chapter applies to an aerial work certificate holder.
- (2) This Chapter applies in relation to the use of NVIS by a flight crew member of an aerial work certificate holder in an NVIS flight.
- (3) This Chapter does not apply in relation to the use of NVIS, on an NVIS flight for an aerial work certificate holder, by a person who is not a flight crew member, unless the person is involved in air navigation or terrain avoidance functions.

Note 1 Regulation 138.350 which empowers this MOS Chapter does not apply to limited aerial work operators. Therefore, nothing in this Chapter applies to limited aerial work operators. However, regulation 91.085, and therefore Chapter 3 of the Part 91 MOS, does apply to a limited aerial work operator and contains the operational NVIS rules for such an operator.

Note 2 For NVIS equipment requirements: see Division 26.17 of the Part 91 MOS.

12.03 Definitions

- (1) In this Chapter:

HLS means helicopter landing site.

HLS-NVIS basic means a HLS that does not conform to the requirement of a HLS-NVIS standard.

HLS-NVIS standard has the meaning given in section 12.05.

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

- (a) equipped for IFR flight in accordance with the regulations; and
- (b) operated by a crew who 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:

- (a) equipped for flight in night VMC in accordance with the regulations; and
- (b) operated by a crew each member of which meets the relevant requirements for NVFR flight under Part 61 of CASR.

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

- (a) of an NVIS operator who holds an aerial work certificate for the NVIS operation; and
- (b) 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 Chapter.

NVIS crew member means an NVIS pilot or an NVIS air crew member.

NVIS endorsement means an endorsement mentioned in column 2 of item 1 or item 2 in Table 61.1025 of CASR.

NVIS firebombing means an NVIS operation, in an operational area for a fire, to fight the fire using water, fire retardant, or a similar substance, that is dropped from an aircraft equipped with a belly tank.

NVIS fire mapping means an NVIS operation, in an operational area for a fire, involving the carriage of one or more persons to map, locate or observe fires, or to control or direct firefighting operations.

NVIS flight has the meaning given by the CASR Dictionary.

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

NVIS incendiary dropping means an NVIS operation, in an operational area for a fire, to fight the fire using incendiaries for controlled burning that are dropped from an aircraft by means of an incendiary dropping device.

NVIS operation means an NVIS flight that is an aerial work operation conducted by an aerial work operator.

Note An aerial work operator is the holder of an aerial work certificate.

NVIS operator means an aerial work certificate holder for an NVIS operation.

NVIS pilot, for an NVIS operation, means a pilot who:

- (a) holds each of the licences, ratings and endorsements required for NVIS flight by Part 61 of CASR; or
- (b) 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.

NVIS rating means a rating mentioned in column 2 of item 4 in Table 61.375 of CASR.

operator has the meaning given by the CASR Dictionary.

Note Operator, of an aircraft, means:

- (a) if the operation of the aircraft is authorised by an AOC, a Part 141 certificate or an aerial work certificate — the holder of the AOC or the certificate; or
- (b) otherwise — the person, organisation or enterprise engaged in aircraft operations involving the aircraft.

safety area means an area:

- (a) that is free of obstacles, other than those:
 - (i) with a height not exceeding 25cm above the surface level of the area; or
 - (ii) that are required for air navigation purposes; and

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

- (b) 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 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.

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.

- (2) Subject to subsection (1), in this instrument words and phrases have the same meaning as in CASR.

Division 2 — Requirements for NVIS operations

12.04 General HLS-NVIS requirements

An aircraft in an NVIS operation may only take off from and land on:

- (a) a HLS-NVIS standard; or
- (b) subject to section 12.06 — a HLS-NVIS basic.

12.05 HLS-NVIS standard

- (1) Subject to subsection (2), a HLS-NVIS standard is a HLS that meets all of the following requirements:
 - (a) the FATO must at least:

- (i) be capable of enclosing a circle with a diameter equal to one-and-a-half times the D-Value (1.5xD) of the rotorcraft; and
- (ii) be free of obstacles likely to interfere with the manoeuvring of the rotorcraft; and
- (iii) incorporate a safety area of 0.25 x D, or 3 m around the FATO, whichever is larger; and
- (b) a TLOF must be at least:
 - (i) a cleared and, as far as practicable, stable, area capable of bearing the dynamic loads which may be imposed by the rotorcraft; and
 - (ii) an area of 0.83 x D.
- (2) A HLS-NVIS standard for a particular NVIS operation also includes a HLS that meets the FATO and TLOF criteria determined by the NVIS operator through a risk assessment, provided that the FATO and the TLOF so determined will deliver a level of safety that is at least equivalent to that which would otherwise arise from compliance with paragraphs (1) (a) and (1) (b).

12.06 HLS-NVIS basic

A rotorcraft for an NVIS operation may land on or take off from a HLS-NVIS basic but only if the NVIS crew consists of:

- (a) at least 2 NVIS pilots; or
- (b) 1 NVIS pilot and at least 1 NVIS air crew member; or
- (c) 1 NVIS pilot, but only if the operation is conducted by an NVIS operator who holds a CASA approval under regulation 138.025 (1) that is based on the operator's detailed risk assessment.

12.07 No formation flights

The pilot in command of an aircraft for an NVIS operation must not engage in formation flight with another aircraft.

12.08 Alternate aerodrome lighting requirements

- (1) Subject to subsection (2), if an NVIS operation is:
 - (a) conducted by a single NVIS pilot as the only NVIS crew member; or
 - (b) to a planned destination aerodrome that does not have runway or HLS lighting; then the pilot must nominate a destination alternate aerodrome with lighting for the runway or HLS.
- (2) Subsection (1) does not apply to an NVIS operation that is conducted by:
 - (a) at least 2 NVIS pilots; or
 - (b) 1 NVIS pilot and at least 1 NVIS air crew member.

12.09 Aircraft lighting requirements

If, in an NVIS operation, the optimum performance of the NVIS is affected, or is likely to be affected, by the aircraft's exterior lighting, the pilot in command must:

- (a) if satisfied that there is no risk of collision with another aircraft — turn off the exterior lighting; or
- (b) if satisfied that there is such a risk — immediately cease the NVIS operation.

Note On ceasing the relevant NVIS operation, the pilot in command, if at a lower altitude, 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.

12.10 Requirements related to NVIS crew members

Note Section 9.04 in Division 3 of Chapter 9 of this MOS outlines the requirements for helicopter IFR flight and VFR flight at night below the minimum height.

- (1) During an NVIS operation NVIS must be used by each NVIS pilot and each NVIS air crew member who is involved in the operation.
- (2) A pilot in an NVIS operation must be an NVIS pilot.
- (3) Each air crew member who uses NVIS in an NVIS operation must be:
 - (a) an NVIS air crew member; or
 - (b) a person, otherwise qualified for the operation, who is under flight training or flight testing to become an NVIS air crew member.
- (4) Subject to subsection (5), if a single NVIS pilot is the only NVIS crew member in an NVIS operation, the operation must be conducted at or above 1 000 ft AGL.
- (5) An NVIS operation mentioned in subsection (4) may be conducted below 1 000 ft AGL only if it is:
 - (a) operationally necessary; and
 - (b) not conducted below 500 ft AGL; and
 - (c) the subject of the operator's detailed risk assessment given to CASA; and
 - (d) conducted by an NVIS operator who holds a CASA approval for the operation under regulation 138.025 that is based on the detailed risk assessment.
- (6) If an NVIS operation is conducted below 500 ft AGL in the hover with an NVIS air crew member, then despite any other provision in this Chapter the pilot in command may do any of the following:
 - (a) de-goggle as an individual;
 - (b) permit all or any particular NVIS air crew member to de-goggle;
 but only if, and for so long as, the de-goggling enhances operational safety.

Note Where the performance of the NVIS is degraded over areas of extensive illumination, and the terrain and obstacles can be visually identified and avoided, the pilot in command may elect to de-goggle either as an individual, or as a crew, in the interests of flight safety.

12.11 Weather requirements — cloud

- (1) The pilot in command of an aircraft for an NVIS operation must comply with one of the following for the operation:
 - (a) the in-flight cloud requirements set out in Table 12.11 (1) of this MOS; or
 - (b) the in-flight cloud requirements approved by CASA under subsection (3).
- (2) For Table 12.11 (1), for an NVIS aircraft and crew mentioned in an item of column 1 of the Table, that is conducting an NVIS operation of a kind mentioned in column 2 of the item, the minimum in-flight cloud requirements are set out in column 3 of the item.

Table 12.11 (1) In-flight cloud requirements

Item	Column 1 NVIS aircraft and crew	Column 2 Kind of NVIS operation	Column 3 Minimum in-flight cloud requirement

1	NVFR capable, with 2 NVIS crew members	Under the VFR	No more than scattered cloud up to 2 000 ft AGL within 2 NM either side of track.
2	IFR capable	Under the VFR	No more than scattered cloud up to 1 000 ft AGL within 2 NM either side of track
3	IFR capable	Under the IFR below LSALT	No more than scattered cloud up to 1 000 ft AGL within 2 NM either side of track.

Note NVFR capable and IFR capable are defined in subsection 12.03, Definitions.

- (3) An NVIS operation may comply with in-flight cloud requirements lower than those provided for under paragraph (1) (a) (*reduced in-flight cloud requirements*) but only if the lower requirements are:
- (a) operationally necessary; and
 - (b) the subject of a detailed risk assessment given to CASA; and
 - (c) the aerial work operator holds a CASA approval under regulation 138.025.
- (4) If:
- (a) an NVIS operation is NVFR capable; but
 - (b) the NVIS crew is only a single NVIS pilot;
- then the NVIS pilot must comply with night VFR weather minima.
- (5) Subsection (1) does not apply to the pilot in command of a rotorcraft in an NVIS operation to which Division 5 of Chapter 9 applies.

[13] Paragraph 15.08 (3) (b)

repeal and substitute

- (b) visible through an NVIS, provided that the flight is conducted in accordance with the requirements for an NVIS operation.

[14] Paragraphs 15.11 (a) and (b)

repeal and substitute

- (a) as specified under Chapter 26 of the Part 91 MOS for rotorcraft IFR flight; and
- (b) with lighting as specified under section 22.07 as if it applied to the operation; and

[15] Section 16.01

repeal and substitute

Division 1 Preliminary

16.01 Application

This Chapter applies to the following operators (*operators*):

- (a) an aerial work certificate holder;
- (b) a limited aerial work operator.

[16] After sections 16.03

insert

Division 2 — NVIS firebombing

16.04 Application

This Division applies to an NVIS operator, and the pilot in command of the operator's aircraft, when engaged in NVIS firebombing (the *operation*).

16.05 Compliance

- (1) For subregulation 138.425 (2), the NVIS operator, and the pilot in command, of an aircraft engaged in NVIS firebombing must each ensure that the requirements of this Division are complied with.
- (2) An aeroplane may only be used in NVIS firebombing below the prescribed height if:
 - (a) the operation is the subject of the NVIS operator's detailed risk assessment given to CASA; and
 - (b) the NVIS operator satisfies CASA that the operator and the pilot in command are demonstrably capable and competent to conduct and carry out the operation; and
 - (c) the NVIS operator holds a CASA approval for the NVIS firebombing under regulation 138.025.

Note Applications for approvals are assessed by CASA in accordance with Subpart 11.B of CASR. Operators should note that CASA may apply conditions to an approval in accordance with regulation 11.056.

16.06 Crew composition, qualification and experience

- (1) The minimum crew for the operation must be at least 2 NVIS pilots, one of whom is the pilot in command.
- (2) The pilot in command of a helicopter for the operation must:
 - (a) hold a Grade 1 NVIS endorsement under Part 61 of CASR, or an equivalent qualification granted by an NAA; and
 - (b) satisfy the relevant instrument proficiency and recency requirements under Part 61 of CASR, or the equivalent requirements of the NAA.
- (3) Each pilot of a helicopter for the operation must have the following aeronautical experience:
 - (a) 1 500 hours of flight time as a pilot in command of a helicopter;
 - (b) 50 hours in the type or class of helicopter being used for the NVIS firebombing; and
 - (c) 100 hours of flight time in a helicopter conducting firebombing operations by day or night.

16.07 Use of a belly tank

- (1) An aircraft belly tank may only be filled or refilled from one of the following locations:
 - (a) for a helicopter on the ground — a source on the ground at a HLS-NVIS standard;
 - (b) for a helicopter in the hover and using the helicopter's on-board pump — a portable tank at a HLS-NVIS standard;

- (c) for an aeroplane on the ground — a source on the ground at an aerodrome;
 - (d) otherwise — any location, or multiple locations with particular common characteristics, for which the operator holds a CASA approval under regulation 138.025.
- (2) For paragraph (1)(c), CASA may approve a location or a kind of location (with or without conditions) if:
- (a) the operator’s application includes a detailed risk assessment; and
 - (b) taking into account the following:
 - (i) the risks identified by the operator or by CASA;
 - (ii) the nature of the operation;
 - (iii) the nature of the location or kind of location;
 - (iv) any conditions that would be imposed on an approval;
- approval of the location, or kind of location, would not have an adverse effect on aviation safety.

Note Conditions may include (but are not limited to), for example, limitations on flight time for particular operations or locations, requirements for underwater escape training, collection system and other equipment requirements, including additional search-lighting, prior survey of locations and environmental circumstances such as weather and degree of moonlight.

Division 3 — NVIS incendiary dropping

16.08 Application

This Division applies to an NVIS operator, and the pilot in command of the operator’s aircraft, when engaged in NVIS incendiary dropping (the *operation*).

16.09 Compliance

For subregulation 138.425 (2), the NVIS operator, and the pilot in command, of an aircraft engaged in NVIS incendiary dropping must each ensure that the requirements of this Division are complied with.

16.10 Crew composition, qualification and experience

The minimum crew must be:

- (a) 2 NVIS pilots, and 1 task specialist who is an incendiary dropping device operator; or
- (b) 1 NVIS pilot, and 1 NVIS air crew member, and 1 task specialist who is an incendiary dropping device operator.

[17] After sections 17.09

insert

Division 4 — NVIS fire mapping

17.10 Application

This Division applies to an NVIS operator, and the pilot in command of the operator’s aircraft, when engaged in NVIS fire mapping.

17.11 Compliance

For subregulation 138.430 (2), the operator, and the pilot in command, of an aircraft engaged in NVIS fire mapping must each ensure that the requirements of this Division are complied with.

17.12 Crew composition, qualification, and experience

- (1) The minimum crew for NVIS fire mapping conducted at or above 1 000 ft AGL must be the following:
 - (a) 1 NVIS pilot;
 - (b) 1 task specialist who is the fire mapping observer.
- (2) The minimum crew for NVIS fire mapping conducted below 1000 ft AGL must be the following:
 - (a) 1 NVIS pilot;
 - (b) 1 NVIS air crew member;
 - (c) 1 task specialist who is the fire mapping observer.

[18] Paragraph 22.07 (4), the Note

repeal and substitute

Note See also Chapters 9 and 12 of this MOS.

[19] After section 22.09

insert

22.10 Minimum equipment for NVIS incendiary dropping, NVIS fire mapping and NVIS firebombing

- (1) For NVIS incendiary dropping, an aircraft must be equipped with the following:
 - (a) an NVIS incendiary dropping device (including its associated systems), approved in writing by CASA, which meets at least the specifications set out in an NVIS incendiary dropping device airworthiness bulletin published by CASA for this provision, and as in force from time to time;
 - (b) fittings and mountings for the NVIS incendiary dropping device, and its directly associated systems, that have design approval under Subpart 21.M of CASR;
 - (c) 1 standby attitude indicator installation that complies with the requirements set out in column 2 of item 6 of Table 26.12 (7) in the Part 91 MOS.
- (2) For NVIS fire mapping, an aircraft must be equipped with the following:
 - (a) at least 1 GNSS, with a map display, that complies with the requirements of paragraph (a) of the definition of **approved GNSS** in section 1.06 of the Part 91 MOS;
 - (b) 1 standby attitude indicator installation that complies with the requirements set out in column 2 of item 6 of Table 26.12 (7) in the Part 91 MOS.
- (3) For NVIS firebombing, an aircraft must be:
 - (a) either:
 - (i) certified for flight under the IFR; or
 - (ii) if, on the basis of a safety case that demonstrates a level of safety for the NVIS firebombing operation that is at least equivalent to that of a aircraft

certified for operations under the IFR — certified for flight under the NVFR;
and

- (b) equipped with at least 1 GNSS, with a map display, that complies with the requirements of paragraph (a) of the definition of *approved GNSS* in section 1.06 of the Part 91 MOS.
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