I, SHANE PATRICK CARMODY, Acting Director of Aviation Safety, on behalf of CASA, make this instrument under paragraph 28BA (1) (b) of the Civil Aviation Act 1988 and subregulations 5 (1), 207 (2), 215 (3), 217 (1) and 308 (1) of the Civil Aviation Regulations 1988.

Shane Carmody  
Acting Director of Aviation Safety and  
Chief Executive Officer

July 2007

Civil Aviation Order 82.6 Instrument 2007

1 Name of instrument
This instrument is the Civil Aviation Order 82.6 Instrument 2007.

2 Duration
This instrument:
(a) commences on the day after it is registered; and
(b) stops having effect at the end of 30 June 2008.

Note: The temporary nature of this instrument is to facilitate a controlled trial of night vision goggles by approved operators.

3 Transitional
An instrument issued before the commencement of this Order that has the effect of authorising use of night vision goggles (NVG) is revoked to the extent that the instrument relates to the use of NVG.

4 Civil Aviation Order 82.6
Schedule 1 makes Civil Aviation Order 82.6.
1 Definitions

In this Order:

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

(a) lost or damaged in, on or by a helicopter in which NVG are used; or
(b) at significant risk of loss or damage in, on or by a helicopter.

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

**aerial fire fighting** means an operation in an operational area for a fire to fight the fire from the air using only the following:

(a) a multi-engine helicopter equipped with a belly tank that:

(i) is capable of being filled and refilled while the helicopter is on the ground; and

(ii) during the operation, is only filled or refilled while the helicopter is on the ground;

(b) a flight crew of at least 1 pilot and 1 aircrew member.

**aerial fire fighting support** means an operation for:

(a) the tactical insertion or extraction of firefighting crews in an operational area for a fire; or

(b) the carriage of persons to map, locate or observe fires, or to control or direct firefighting operations.

*Note* In this Order, aerial fire fighting support does not include aerial fire fighting in the form of, for example, water bombing.

**aided flight** means a flight in which NVG are used in an operational position by trained personnel to enhance night vision.

*Note* Aided flight is associated with the procedure of goggle-up where the crew member places NVG in the operational position.

**aircrew member** means a crew member of a helicopter (other than a supernumerary crew member) assigned by the operator:

(a) to assist the pilot in the operation of the helicopter; or

(b) to operate the winch on the helicopter; or

(c) to supervise rappelling or sling load operations; or

(d) to supervise or assist a medical, paramedical or rescue crew member in the performance of his or her duties on the helicopter.
approved NVG flight simulator means a flight simulator approved by CASA for NVG initial qualification training by a trainee who holds an endorsement for the aircraft which is simulated.

approved operator means an operator who has the approval mentioned in subparagraph 1 (c) (iii) of Appendix 1 to use NVG for the trial.

CAR 1988 means the Civil Aviation Regulations 1988.

de-goggle means the action of transferring from NVG flight to non-NVG (unaided) flight by removing the NVG from a usable position.

Note The expression is also used as a command and is opposite to goggle-up.

devoid of surrounding cultural lighting means that at 500 ft above the terrain, and any object on it, in an area there is insufficient ground lighting to maintain an unaided visible horizon.

emergency medical services means an operation where transportation is required to facilitate emergency or medical assistance by an aircraft carrying 1 or more of the following:

(a) medical personnel;
(b) medical supplies (including equipment, blood, organs or drugs);
(c) ill or injured persons, and other persons directly involved in, or associated with, their retrieval or care.

Note The expression is also used as a command and is opposite to de-goggle.

HLS means a helicopter landing site.

HLS-NVG basic means a HLS that:

(a) does not conform to the guidelines contained in CAAP 92-2 (1) for standard HLS night operations; and

(b) is unlit or unprepared.

HLS-NVG standard means a HLS that:

(a) conforms to the guidelines contained in CAAP 92-2 (1) for NVG standard HLS night operations; and

(b) is unlit; and

(c) does not require a windsock.

HLS operations for a helicopter means:

(a) take off or landing at a HLS; or

(b) operations at a HLS that do not involve a landing on skids or wheels; or

(c) HLS similar operations:

(i) that are approach to the hover, winching, sling load operations, rappelling, hovering, deplaning, emplaning or similar types of operations; and

(ii) for the conduct of which each relevant crew member is qualified.
law enforcement, for an operation, means an operation for the enforcement of the laws applying in Australian territory, including, customs, waterways or border protection laws.

LSALT, or lowest safe altitude, means not less than 1 000 feet above the highest obstacle located within 10 miles of the helicopter in flight, except when take-off or landing is necessary.

marine pilot transfer means an operation, in accordance with Civil Aviation Order 95.7.3, to transfer a marine pilot from:

(a) land to ship; or
(b) ship to land or
(c) ship to ship.

minimum NVG crew means the minimum number of NVG aided and NVG qualified crew members required for a particular flight or operation.

Note CASA approval is not required for a person to use NVG only for observation or surveillance that is not the primary means of terrain avoidance for safe air navigation using visual surface reference external to the aircraft. However, a person engaged in such unapproved use is not part of the minimum NVG crew.

NVD, or night vision device, means night vision enhancement equipment fitted to, or mounted in or on, an aircraft, or worn by a person in the aircraft, and that can:

(a) detect and amplify light in both the visual and near infra-red bands of the electromagnetic spectrum; or

(b) provide an artificial image representing topographical displays.

NVFR means night visual flight rules.

NVG, or night vision goggles, means a self-contained binocular night vision enhancement device, usually helmet mounted or otherwise worn by a person that can detect and amplify light in both the visual and near infra-red bands of the electromagnetic spectrum.

NVG aircrew member means a person who:

(a) has successfully completed NVG aircrew member training and is qualified in accordance with this Order; or

(b) is an NVG aircrew member instructor; or

(c) is an NVG pilot, an NVG flight instructor, an NVG FOI or an NVG testing officer who has complied with the aircrew member training and competency requirements of Appendix 3.

NVG aircrew member instructor means a person qualified in accordance with this Order to instruct air crew members.

NVG CCF, or NVG capability check flight, means:

(a) if carried out by a TCO — an NVG proficiency check flight to test aeronautical skills and knowledge for use of NVG, carried out in accordance with:

(i) the requirements of this Order for an NVG CCF; and

Page 4 of 36 pages
(ii) the operator’s training and checking manual; and

(b) otherwise — an NVG base check flight to test aeronautical skills and knowledge for use of NVG, carried out in accordance with:

(i) the requirements of this Order for an NVG CCF; and

(ii) Part C of the operator’s operations manual.

NVG compatible lighting means aircraft interior or exterior lighting with spectral wavelength, colour, luminance level and uniformity, that has been modified, or designed for use with NVG, and does not degrade or interfere with the image intensification capability performance of the NVG beyond acceptable standards.

NVG flight instructor means an NVG pilot who is a flight instructor qualified in accordance with this Order and approved in writing by CASA to conduct NVG training.

Note NVG flight time must be logged in the specialist column of the aircrew flying log book.

NVG FOI means a CASA flying operations inspector appointed to carry out some, or all, of the duties of an NVG FOI or an NVG testing officer.

NVG initial training means training to qualify a person for an NVG pilot or NVG aircrew member qualification.

NVG operation means a permitted NVG operation under subclause 5.1 of Appendix 1.

NVG operator means an operator approved by CASA under clause 2 of Appendix 1 to conduct NVG operations.

NVG pilot means a person who:

(a) has successfully met the requirements of this Order for the issue of an initial NVG endorsement and had his or her log book endorsed accordingly; or

(b) is an NVG flight instructor, an NVG training and checking pilot, an NVG FOI or an NVG testing officer.

NVG testing officer means a person appointed in writing by CASA to be an NVG testing officer to:

(a) conduct NVG flight tests; and

(b) issue endorsements for NVG qualifications based on those flight tests.

NVG training means training undertaken by a pilot, or aircrew member, for NVG flight in accordance with the relevant training requirements and competency standards mentioned in this Order.

NVG training and checking pilot means an NVG pilot who is a training and checking pilot for a TCO, qualified in accordance with this Order and approved in writing by CASA to conduct training and checking.
NVG training provider means:

(a) a training organisation in Australia approved by CASA to provide NVG initial training for this Order; or

(b) a training organisation outside Australia approved by the relevant national aviation authority, recognised by CASA, to provide NVG initial training.

Note The national aviation authorities, recognised by CASA, are listed in CAAP 174-1.

NVG trial means the controlled trial of NVG in accordance with this Order by NVG operators approved by CASA to participate in the trial.

NVIS, or night vision imaging system, means the system in which all of the elements required to operate an aircraft effectively and safely using NVG are integrated, including NVG and associated equipment, NVG compatible lighting, other associated aircraft components and equipment, associated training and recency requirements and continuing airworthiness.

Note NVIS is synonymous with aviator night vision imaging systems, sometimes called ANVIS.

resolution means the capability of NVG to present an image that makes clear and distinguishable the separate components of a scene or object.


search and rescue means an operation by an aircraft to search, locate, rescue, or provide immediate assistance to, a person threatened by a grave and immediate danger or a hostile environment.

TCO, or training and checking organisation, means a training and checking organisation approved by CASA under subregulation 217 (1) of CAR 1988 for this Order.

unaided flight means the NVG is in a non-operational position when night vision is not being enhanced by any other means.

Note Unaided flight is associated with the de-goggle procedure where the crew member places the NVG in the non-operational position.

use, in relation to NVG, means use as the primary means of terrain avoidance for safe air navigation by means of visual surface reference external to the aircraft.

Part 2 — Directions and exemptions

2 Direction — instruments and equipment

Under subregulation 207 (2) of CAR 1988, for a helicopter in any class of operation permitted under this instrument to use NVG, CASA approves NVG that comply with all of the requirements of this Order and directs NVG use only in accordance with this Order.

3 Direction — operations manual

Under subregulation 215 (3) of CAR 1988, CASA makes the directions that appear in this Order.
4 Specified operators — provision of a TCO
Under subregulation 217 (1) of CAR 1988, CASA specifies that each NVG operator must provide a TCO for NVG initial training unless the training is provided by an NVG training provider.

5 Direction — operations manual
If an operator does not have, or use, a TCO or NVG training provider for training, the operator may only conduct training, other than initial training, if the operations manual specifies the line and role training requirements in Part C of the operations manual.

6 Exemption — minimum height for V.F.R. flights at night
Under subregulation 308 (1) of CAR 1988, the pilot in command of a helicopter is exempt from compliance with subregulation 174B (1) of CAR 1988 if:
(a) he or she is engaged in conducting an operation that is 1 of the following permitted NVG operations:
   (i) search and rescue, law enforcement, emergency medical services or aerial fire fighting;
   (ii) NVG training for an operation mentioned in subparagraph 6 (a) (i);
   (iii) an NVG positioning flight for an operation mentioned in subparagraph 6 (a) (i);
   (iv) NVG initial training by a TCO or NVG training provider; and
(b) he or she uses NVG for the operation in accordance with this Order and the operator’s operations manual; and
(c) it is operationally necessary to fly below the relevant LSALT that would apply but for this exemption.

7 Exemption — navigation lights
Under subregulation 308 (1) of CAR 1988, the operator and the pilot in command of a helicopter in an NVG operation are each exempt from compliance with subregulation 195 (1) of CAR 1988 for a navigation lighting requirement of Part 13 of CAR 1988 if he or she is complying with a lighting requirement of this Order that is at variance with the requirement of Part 13.

Note The pilot in command should put a note in the free text section of the flight notification to advise air traffic control that he or she is goggle equipped and may be operating without displaying lights.
Part 3 — Conditions on each air operator’s certificate

8 AOC condition

8.1 For paragraph 28BA (1) (b) of the Act, an AOC is subject to the condition that the AOC holder must comply with this Order for the use of NVG.

8.2 This Order does not affect the operation of any other Civil Aviation Order.

9 Conditions for use of NVG by an AOC holder

9.1 An AOC holder (the holder) may only use a night vision device that is in the form of NVG and the use may only be in accordance with this Order and the holder’s operations manual.

9.2 If a TCO, or an NVG training provider, is approved by CASA to use NVG for NVG initial training, the TCO or the training provider must also have an AOC that authorises NVG flying training.
Appendix 1

Use of NVG

1  Restricted use of NVG

NVG may only be used in an operation:

(a) in accordance with this Order; and

(b) by an operator who has prepared a risk assessment for operations using NVG; and

(c) if the operator:

(i) complies with the directions in Appendix 2, or with any other directions issued by CASA under subregulation 215 (3) of CAR 1988, about the information, procedures and instructions to be included, revised or varied in the operator’s operations manual; and

(ii) ensures compliance with the operations manual; and

(iii) has the written approval of CASA to use NVG for the NVG trial in accordance with clause 2 and the approval has not been suspended or revoked under clause 3.

Note 1  Directions are set out in this Order. CASA may issue other directions under subregulation 215 (3) of CAR 1988 to individual operators of its own volition or on request.

Note 2  Under subregulation 215 (9) of CAR 1988, each member of an operator’s operations personnel must comply with all instructions in the operations manual in so far as they relate to the person’s duties and activities.

Note 3  The NVG trial is defined in subsection 1 of this Order.

2  Approval to use NVG for the trial

2.1  An operator may apply to CASA in writing for approval to use NVG in accordance with this Order.

2.2  CASA may issue the approval only if the operator demonstrates that it complies with the requirements of this Order.

2.3  An approval may be issued subject to conditions that are necessary in the interests of safety.

3  Suspension, revocation or variation of approval

3.1  An approval stops having effect if:

(a) it is suspended or revoked by CASA; or

(b) the operator tells CASA in writing that the operator wants to surrender the approval.

3.2  If the approval is revoked or surrendered, the operator must return the approval instrument to CASA within 14 days.
3.3 CASA may vary, suspend or revoke an approval if:
   (a) the operator does not comply with:
       (i) this Order, including any conditions mentioned in the operator’s approval under clause 1A; or
       (ii) the operations manual; or
   (b) CASA is refused access to the operator to assess its continued compliance with this Order or with the conditions of its approval.

3.4 To avoid doubt, in this clause revoke has the same meaning and effect as cancel.

4 Reporting for NVG trial

4.1 At intervals not exceeding 3 months, each approved operator must report to CASA in writing:
   (a) the number and nature of NVG operations conducted in the preceding 3 months, including if no operations were conducted; and
   (b) on any matter mentioned in subclause 4.4.

4.2 If, during an operation under the NVFR or the I.F.R., an adverse event occurs (with or without NVG), the operator must ensure that the pilot in command of the helicopter completes and submits to CASA, within 24 hours of completion of the operation, the web based or other approved reporting form.

4.3 The operator must complete his or her investigation into an adverse event as soon as possible and report the results to CASA immediately after that.

4.4 Without affecting any requirement to report to the Australian Transport Safety Bureau (ATSB), each approved operator must report to CASA any Immediately Reportable Matters and any Routinely Reportable Matters involving the use of NVG which it reported to the ATSB.

4.5 Each approved operator must report to CASA details of any unusual or abnormal operation of its NVIS.

   Note The ATSB reporting format is acceptable as a form for this report.

5 Permitted NVG operations

5.1 NVG as the primary means of terrain avoidance for safe air navigation by means of visual surface reference external to an aircraft may only be used in the following helicopter NVG operations (permitted NVG operations):
   (a) search and rescue;
   (b) law enforcement;
   (c) aerial fire fighting;
   (d) aerial fire fighting support;
   (e) emergency medical services;
   (f) marine pilot transfer;
   (g) provision of:
       (i) NVG initial training; or
(ii) NVG training for 1 or more of the operations mentioned in paragraphs (a) to (f); or

(iii) NVG CCF or NVG flight tests;

(h) positioning flight for an operation mentioned in paragraphs (a) to (f), inclusive;

(h) NVG flight for demonstrating NVG technology.

5.2 A permitted NVG operation under the V.F.R. must be conducted at, or above, LSALT unless permitted otherwise in accordance with subsection 6 of this Order.

5.3 A permitted NVG operation may only be conducted in a helicopter that is at least equipped and maintained for NVFR.

Note NVG operations are an adjunct to flight under the NVFR. It is intended that the flight crew in an I.F.R.-capable aircraft may derive an operational advantage from NVG use if they so chose and hold the appropriate approvals. Therefore, before commencing an approved NVG operation in an I.F.R.-capable helicopter, the pilot in command must change from flight under the I.F.R. to flight under the NVFR.

5.4 A pilot who manipulates the flight controls of a helicopter may only use NVG in accordance with this Order and the operator’s operations manual.

5.5 An aircrew member who is directly involved in an air navigation or terrain avoidance function of a helicopter may only use NVG in accordance with this Order and the operator’s operations manual.

Note This requirement does not apply where NVG are used by an appropriately trained person for observation or surveillance which is not the primary means of terrain avoidance for safe air navigation using visual surface reference external to the aircraft.

6 NVG qualifications

6.1 NVG qualifications are as follows:

(a) NVG pilot;

(b) NVG chief pilot;

(c) NVG testing officer

(d) NVG flight instructor;

(e) NVG training and checking pilot;

(f) NVG aircrew member instructor;

(g) NVG aircrew member.

6.2 Only an NVG flight instructor may instruct a pilot for initial NVG pilot qualification.

6.3 Only an NVG aircrew member instructor may instruct an aircrew member for initial NVG aircrew member qualification.

Note See Part 4 of Appendix 3 for the requirements to be met to hold an NVG qualification.

7 Prerequisites for training

Before commencing NVG training with an operator, a person must meet the prerequisite requirements mentioned in Part 6 of Appendix 3 of this Order.
8 Training requirements

NVG training by an operator must:

(a) for initial training — be conducted by a TCO or NVG training provider; and

(b) for other training — be conducted by:

(i) an TCO or NVG training provider; or

(ii) an NVG flight instructor or other person approved by CASA and acting in accordance with the line and role training requirements in Part C of the operator’s operations manual; and

(c) meet the requirements of:

(i) Part 6 of Appendix 3 of this Order; and

(ii) the operator’s operations manual.

*Note* Training guidelines and an example of a syllabus that would meet the requirements for CASA approval are set out in CAAP 174-1 (0).

9 NVG endorsements

9.1 An applicant may obtain an NVG pilot qualification only by a log book endorsement entered by CASA or an NVG testing officer.

9.2 An applicant may obtain an NVG aircrew member qualification only by a log book endorsement entered by CASA or an authorised person.

*Note* This log book entry must be in a form other than an authorised person’s “sticky label”.

9.3 Subject to clause 10, the log book endorsement of an NVG aircrew member qualification may only be made after the applicant has successfully completed the training and competency assessment for the qualification in accordance with the requirements of an NVG training syllabus approved by CASA.

9.4 The applicant for endorsement of an NVG qualification must be eligible for the qualification in accordance with the eligibility and prerequisite requirements in this Order.

9.5 The log book endorsement must specify 1 or more NVG qualifications.


10 Endorsements based on recognition of training and experience

10.1 CASA may issue a person with a log book endorsement for a particular NVG qualification if, having taken into account the interests of the safety of air navigation, CASA is satisfied that:

(a) the person has training and experience comparable to the requirements of the competencies detailed in this Order for the particular NVG qualification; and

(b) the person can demonstrate that he or she has completed, and been examined on, the regulatory component of an NVG ground training course approved by CASA; and
(c) in a flight test, conducted by an NVG testing officer or an NVG FOI, the person has demonstrated competency in each of the matters mentioned in paragraphs 31 (a) to 31 (l) of Appendix 3.

Note Guidelines on the restricted circumstances in which CASA may issue a log book endorsement under subsection 10 are set out in CAAP 174-1 (0) and in the Flight Crew Licensing Procedures Manual.

10.2 CASA may accept that a flight test conducted outside Australia by an NVG training provider meets the requirements of subparagraph 10.1 (e) if the person gives CASA persuasive written evidence that the competencies mentioned in the subparagraph have been demonstrated in the flight test.

Note 1 See the requirements for such a provider in subparagraph (b) of the definition of NVG training provider.

Note 2 Persuasive evidence is normally a signed statement by a person approved by the relevant NAA for NVG testing, recording for each of the competencies that it has been demonstrated.

11 Endorsement and experience requirements for operations

11.1 Before commencing a permitted NVG operation, a pilot must meet the endorsement and experience requirements of this Order.

11.2 Unless otherwise approved by CASA, before an NVG pilot may use NVG for the first time in a helicopter for which he or she holds a type endorsement, he or she must, within the preceding 4 weeks, have had an NVG CCF in the helicopter type.

12 Competency, recency and NVG CCF capability

For an operation requiring a person to have a particular NVG qualification, the person must have competency, recency and capability in terms of NVG CCF in accordance with the requirements of this Order and the operator’s operations manual.

13 NVG capability check flights

NVG CCF may only be conducted for an operator by the following:

(a) for an NVG pilot:
   (i) an NVG FOI; or
   (ii) an NVG testing officer; or
   (iii) if the operator has a TCO — an approved NVG training and checking pilot employed by the TCO; or
   (iv) otherwise — the operator’s NVG qualified chief pilot or another approved senior NVG pilot;

(b) for an NVG aircrew member:
   (i) if the operator has a TCO — an NVG aircrew member instructor appointed by the TCO; or
   (ii) otherwise — an approved senior aircrew member appointed by the operator.
14  **Flight testing and issuing endorsements**

14.1 Only an NVG FOI, or an NVG testing officer appointed by CASA specifically for the purpose, may conduct an NVG flight test or issue an NVG endorsement for the following:

(a) an initial NVG pilot qualification;

(b) an NVG flight instructor qualification;

(c) an NVG training and checking pilot qualification;

(d) recognition of training and experience for clause 10 of this Appendix.

14.2 An NVG aircrew member qualification may only be awarded in accordance with the procedures set out in the operator’s operations manual by an NVG aircrew member instructor approved for training and checking by:

(a) CASA; or

(b) the operator’s TCO.
Appendix 2

Directions under subregulation 215 (3) of CAR 1988 about the information, procedures and instructions in an operator’s operations manual

Part 1 — Preliminary

1 Scope and structure

1.1 NVG operations are to be controlled primarily through the operator’s operations manual which must:

(a) contain information, procedures and instructions as directed by CASA under subregulation 215 (3) of CAR 1988; and

(b) contain information, procedures and instructions about the matters set out in Part 2 of this Appendix; and

(c) be accepted by CASA, and varied or amended only with CASA’s agreement.

1.2 Before an operator conducts an NVG operation, the matters provided for in Appendix 3 must be complied with.

Note Guidelines on how the requirements of Appendix 3 may be met in a way acceptable to CASA are set out in CAAP 174-1 (0).

2 Directions apply

2.1 The directions in Part 2 of this Appendix apply to each operator who conducts a permitted NVG operation unless other directions are issued to the operator in substitution for, or in addition to, these directions.

2.2 An operator’s operations manual must contain, as a minimum, the information, procedures and instructions required by Part 2 of this Appendix in the detail, and to a standard, acceptable to CASA.

Note The effect of these directions is that the operations manual must contain the information, procedures and instructions directed by this Appendix. The information, procedures and instructions contained in the operations manual must be complied with. Guidelines on how the requirements of Part 2 may be met in a way acceptable to CASA are set out in CAAP 174-1 (0).

Part 2 — Directions about information to be contained in an operations manual for NVG operations.

3 Operations manual

For subregulation 215 (3) of CAR 1988, CASA directs that the operations manual of an NVG operator must address, as a minimum, the matters listed in clause 4 in the detail, and to a standard, acceptable to CASA.

4 Operations manual directions

4.1 NVG training

4.1.1 Detailed training programs for any initial qualification training to be carried out, including the following:

(a) pre-course qualification requirements;
(b) ground and flight training syllabus;
(c) risk management plan;
(d) training facilities;
(e) equipment requirements;
(f) competency outcomes;
(g) adequate numbers of qualified training personnel;
(h) crew resource management;
(i) fatigue management training, including in human factors limitations and physiological limitations in NVG flight, for the following:
   (i) the chief pilot responsible for NVG operations or the approved NVG senior pilot appointed to carry out the duties of chief pilot for NVG operations;
   (ii) the operator’s safety manager (however described);
   (iii) each member of a flight crew for an NVG operation.

4.1.2 Ongoing training programs for all NVG flight crew ensuring the following is maintained:
   (a) NVG recency including regaining lapsed recency;
   (b) NVG CCF.

4.1.3 Qualifications for the pre-flight and post-flight inspection procedures and standards that are to be used by the flight crew to establish whether the relevant NVG are serviceable for use before and after a flight.

4.1.4 Procedures to be followed for introducing new aircraft or personal equipment to ensure compatibility with the NVG environment.

4.1.5 Procedures to be followed when introducing new crew, passengers or patients and their equipment and baggage to the NVG environment to ensure NVG compatibility.

4.1.6 Procedures to be followed to prevent, or address the incidence of, overconfidence or complacency in any member of an NVG flight crew.

4.2 Airworthiness and maintenance of night vision equipment and aircraft

4.2.1 Aircraft and NVG pre-flight and post-flight procedures including:
   (a) equipment checks; and
   (b) procedures, including aircraft and NVG equipment, inspection criteria; and
   (c) storage; and
   (d) quarantine; and
   (e) logging of defects.

4.2.2 Manufacturer’s inspection criteria to be kept in the company technical library with copies accessible for ready reference to all NVG crew.

4.2.3 MEL related to lighting systems.
4.2.4 Mounting system requirements for handling by pilots and other crew members.

4.2.5 Stowage and use procedures for crew members not using head mounted attachments.

4.2.6 Procedures that ensure NVG operations are only conducted in a helicopter that is equipped and maintained for NVFR.

4.2.7 Manufacturer’s requirements for the maintenance and modification of aircrew flying helmets for NVG use.

4.3 NVG flight operations

4.3.1 Procedures and plans
Operational procedures and risk management plans (including fatigue awareness and management) for all intended NVG flight profiles including over water and shipboard operations.

4.3.2 Post-NVG endorsement requirements
(a) Post-NVG endorsement experience required before a person may be a pilot in command.

(b) NVG capability check flights required for an NVG pilot using NVG for the first time in a helicopter for which he or she holds a type endorsement.

4.3.3 Equipment
Equipment to be carried and used on NVG flights or operations and associated limitations and serviceability.

4.3.4 NVG flight crew composition, roles and responsibilities
(a) Minimum NVG crew composition, qualifications, and experience requirements for each intended NVG flight profile.

(b) Crew stations, duties and responsibilities for all crew in all phases of NVG flight.

(c) Procedures, crew duties, crew co-ordination and phraseology for transition between flight under the I.F.R. and flight under the NVFR.

(d) Logging of NVG flight time.

4.3.5 Weather and environment
(a) Minimum weather conditions and alternate aerodrome requirements at departure, en route and at the destination or area of operations.

(b) Thunderstorm avoidance instructions.

(c) Guidance material on other operational environment conditions that may affect NVG flight, including smoke, snow and dust haze, atmospheric moisture, predicted moon data, for example, moon rise and set times, elevation, ambient illumination and similar matters.
4.3.6 Dissimilar NVG

(a) Where dissimilar NVG are to be used:
   (i) a hierarchical list of the various NVG in terms of level; and
   (ii) a statement requiring the pilot in command to wear the highest level of NVG.

(b) A specific risk management plan for resolving any human factor or risk issues resulting from the differences between the dissimilar NVG.

4.3.7 NVG flight

(a) Pre-flight preparation, briefing, procedures and documentation.

(b) Minimum NVG flight altitudes and requirements and limitations on flight below LSALT if such flight is permitted in accordance with this Order.

(c) Crew goggle up and de-goggle procedures and the procedures to ensure the delineation of aided and unaided flight.

(d) Procedures for the use of aircraft landing lights and searchlights when below LSALT for descent, approach, landing or take off, including procedures for wire and obstacle detection and avoidance using white light (for example from a steerable searchlight or night sun).

(e) Restrictions on in-company and formation NVG flights.

(f) Advice and guidance on the fatigue issues of NVG operations and the physiological stressors of NVG operations.

(g) Flight and duty times.

(h) Guidance for NVG operations over low contrast terrain.

(i) Limitations and requirements for the carriage of passengers.

4.3.8 HLS operations

(a) Register for HLS-NVG standard operations (as per CAAP 92-2 (1)) and HLS-NVG basic operations.

(b) HLS procedures for HLS-NVG basic and HLS-NVG standard operations.

4.4 Phraseology

4.4.1 The operations manual must provide for standard crew phraseology for all phases of NVG flight and must, at a minimum, contain phraseology for:

(a) informing or advising of terrain or other obstructions when operating below LSALT; and

(b) aircrew members providing “the con” for the flying pilot, i.e. verbal corrections to rates of closure, movement, climbs and descents and verbal means of creating accurate mental pictures of the obstacle environment; and

(c) transition between flight under the I.F.R. and flight under the NVFR; and

(d) ensuring scan sector observation responsibility; and

(e) informing crew of emergency situations; and
(f) NVG single tube failure and double tube failure and for selection of back up power; and

(g) informing or advising of obstacles or terrain, or of hazards such as whiteout, brown out, wires or other obstructions;

(h) flight into deteriorating in-flight visibility situations or loss of visual reference (including brownout or whiteout) and

(i) for multiple-crew NVG operations — for “eyes in” and “eyes out” of the cockpit or the aircraft, including to ensure that at all times when the aircraft is below LSALT at least 1 crew member is conducting an NVG scan outside the front of the aircraft.

4.4.2 For single crew NVG operations, the operations manual must contain procedures to remind a single crew member to maintain a vigilant scan outside the helicopter.

4.5 Emergency procedures

4.5.1 The operations manual must provide for procedures, crew duties and crew co-ordination in the event of the following:

(a) in-flight serviceability issues of NVG equipment including:

   (i) single tube failure; and

   (ii) double tube failure (unit failure); and

   (iii) equipment malfunctions (for example, causing “chicken wire”); and

(b) NVG flight into deteriorating weather and visibility or complete loss of visibility conditions (including brownout or whiteout) including:

   (i) when visibility is inadvertently lost on departure from, or arrival at, or over, a HLS; and

   (ii) when in-flight “turn back” procedures, precautionary landings or reversion to unaided flight and flight rules are needed; and

(c) recovery to V.M.C. flight after inadvertent I.M.C. penetration; and

(d) aircraft malfunctions and emergencies.
Appendix 3   NVG equipment, operations, qualifications and training

Part 1 — Scope and structure

1   Matters to be complied with

The requirements of this Appendix for NVG equipment, operations, qualifications and training must be complied with for an NVG operation.

Part 2 — Minimum equipment and aircraft standards for NVG operations

2   Aircraft lighting standards

2.1   Before an aircraft can be used in an NVG operation, the aircraft lighting systems must be:

   (a) NVG compatible; or

   (b) if not compatible — modified to be compatible.

2.2   The design of an aircraft lighting modification for NVG operations must be based on the requirements of RTCA/DO-275, unless an alternative suitable design is demonstrated and acceptable to CASA.

2.3   The requirements of MIL-STD-3009 aircraft, NVIS compatible lighting may also be used if appropriate.

2.4   Before an NVG operation may commence with aircraft lighting modified to be NVG compatible, an advice about the design of the modification must be:

   (a) submitted to CASA or an authorised person appointed for regulation 35 of CAR 1988; and

   (b) accepted by CASA.

2.5   If an operator does not modify exterior helicopter lighting, he or she must prepare a risk management plan to support this outcome.

2.6   If the helicopter’s exterior lighting adversely affects NVG performance, the pilot in command must:

   (a) if he or she is satisfied there is no risk of collision with another aircraft —
       turn off the exterior lighting; or

   (b) if he or she considers there is such a risk — immediately cease NVG operations.

2.7   An operator intending to conduct NVG operations must have an approved system of maintenance which includes procedures to ensure that the ongoing maintenance, inspection, and serviceability standards for the incorporated NVG system (including the NVG itself) will be met.

2.8   The approved procedures mentioned in subclause 2.7 must include a method for assessing NVG compatibility with any subsequent aircraft modification, equipment introduction, or repair.

2.9   Maintenance of NVG must be carried out by an organisation that:

   (a) complies with regulation 30 of CAR 1988 as if the regulation applied to the organisation for the maintenance of NVG and its related equipment; and
(b) is endorsed by the original equipment manufacturer (OEM) of the NVG as an appropriate organisation to carry out maintenance on the NVG.

3 NVG equipment and maintenance standards

3.1 The minimum operational performance specification for NVG equipment for use by flight crew in NVG operations is:

(a) that defined in RTCA/DO 275, as modified by column 3 of the Table in Attachment 1 to this Appendix; or

(b) a CASA approved equivalent in terms of resolution, acuity, gain and reliability.

3.2 Each NVG image intensifier tube and associated NVG equipment must be certified by the manufacturer as being for aviation use.

3.3 NVG must be maintained, stored, and checked for serviceability before an NVG operation, in accordance with the manufacturer’s requirements and procedures.

3.4 If dissimilar NVG are used in an NVG operation, the pilot in command must wear the highest level of NVG in terms of resolution, gain and acuity.

Note: Use of dissimilar NVG does not remove the requirement that the minimum standard of any set used must be in accordance with subclause 3.1.

3.5 An NVG pilot who occupies a control seat of a helicopter during an NVG operation must use the NVG manufacturer’s approved head mounted attachment device for the NVG and must have both hands free for the flight control manipulation during aided flight.

4 Minimum equipment for NVG aircraft in NVG operations

4.1 The operator and the pilot in command of an NVG operation must ensure that the aircraft carries:

(a) at least the minimum equipment required for the category of operation; and

(b) any additional equipment needed to meet the requirements of NVFR, or I.F.R. if used.

4.2 The operator and the pilot in command must ensure that the helicopter has a serviceable radio altimeter that:

(a) displays:

(i) an instantaneous impression of absolute height; and

(ii) the rate of change of height in a form which requires minimal interpretation; and

(b) incorporates:

(i) a system of audio and visual warning to the occupant of each control seat if the aircraft descends below a height previously selected in flight by the pilot in command; or

(ii) a visual and audible height warning system at least equivalent to the system mentioned in subparagraph (i) and is acceptable to CASA.
4.3 The operator and the pilot in command must ensure that the helicopter has a serviceable pilot-steerable searchlight, adjustable in both pitch and azimuth from the flight controls.

4.4 The operator and the pilot in command must ensure that, in an NVG operation below 500 ft AGL or from a HLS-NVG basic using a searchlight with an NVG compatible IR filter, the risk of an adverse event as a result of NVG failure at low altitude is countered by:

(a) the aircraft’s capacity to revert immediately to a non-filtered search or landing light; or

(b) the presence of 2 NVG pilots, each of whom is NVG equipped and has access to dual flight controls.

Part 3 — Operational limitations for NVG operations

5 Minimum altitude for NVG operations

5.1 The pilot in command of a helicopter in an NVG positioning flight that is a permitted NVG operation may fly below the relevant LSALT only if it is operationally necessary to do so and the flight is in accordance with this Order.

5.2 However, the pilot in command in an NVG positioning flight must not fly:

(a) over a city, town or populous area — at a height lower than 1 000 ft AGL; or

(b) over any other area — at a height lower than 500 ft AGL.

Note Paragraph 5.2 (b) does not apply if through stress of weather, or any other unavoidable cause, it is essential that a lower height be maintained.

6 HLS-NVG basic and HLS-NVG standard operations

NVG operations to, or from, a HLS-NVG basic or a HLS-NVG standard are permitted in accordance with this Order.

7 Carriage of persons

The pilot in command of a helicopter in an NVG operation, including an NVG training, qualification or proficiency flight, may only carry the following categories of persons:

(a) members of the flight crew;

(b) members of the aircrew;

(c) any supernumerary crew members;

(d) persons undergoing NVG training;

(e) appropriately qualified maintenance personnel who are present to ensure that the NVIS equipment is, and remains, serviceable;

(f) other persons whose presence is necessary for the success or completion of the operation;

(g) if the operation is an NVG flight to demonstrate NVG technology — a passenger acceptable to CASA to observe the demonstration.
Note  For paragraph 7 (f), examples of a person whose presence may be essential include police, fire fighting, rescue or medical personnel, marine pilots in transfer, and persons who are apprehended, evacuated, rescued or being transported as an integral part of the operation.

8 Minimum crewing for NVG operations

8.1 The minimum NVG crew for an NVG operation must be not less than the highest requirement for NVFR, or I.F.R. if used, that is specified in:

(a) the aircraft’s flight manual; or
(b) the operator’s operations manual acceptable to CASA; or
(c) Australian civil aviation legislation, including this Order, that applies to the aircraft.

8.2 The minimum NVG crew must include any additional qualified crew required by:

(a) the type or class of helicopter; or
(b) the nature of the operation.

8.3 Subject to subclauses 8.1 and 8.2, a single NVG qualified pilot is the minimum NVG crew only if the NVG operation is:

(a) to, and from, a HLS-NVG standard; and
(b) except for take-off and landing, flown at, or above, LSALT.

8.4 Subject to subclauses 8.1 and 8.2, if an NVG operation is not covered by subclause 8.3, the minimum NVG crew is:

(a) single NVG qualified pilot; and
(b) at least 1 of the following using NVG, on intercom, and positioned to be able to provide assistance to the pilot in command:
   (i) an NVG qualified aircrew member; or
   (ii) a second NVG qualified pilot.

8.5 The position and duties of the NVG aircrew member must be set out in the operator’s operations manual.

9 Minimum crewing for NVG training operations

9.1 If an NVG flight is for initial NVG pilot training or qualification, the minimum NVG crew is the trainee pilot and a single NVG flight instructor.

9.2 If an NVG flight is for an NVG pilot to regain lapsed recency or undergo a check flight in the form of an NVG CCF, the minimum NVG crew is the NVG pilot and a single NVG pilot qualified to conduct the check flight.

9.3 During a training flight for NVG aircrew member qualification or an NVG check flight in the form of an NVG CCF, the minimum NVG crew is the aircrew member receiving the training or undergoing the check flight, an NVG aircrew member instructor and the NVG pilot.

10 NVG flight planning for weather minima, alternate aerodromes and fuel requirements
10.1 Each NVG flight must be planned to comply with NVFR weather minima, and alternate aerodrome and fuel requirements.

10.2 An operator may apply in writing to CASA proposing amendments to the operations manual for reduced flight planning weather parameters specific to an NVG operation.

10.3 An amended operations manual may only be used if CASA:
   (a) considers that the proposed amendments, or the proposed amendments as varied by CASA, preserve or enhance the safety of the NVG operation; and
   (b) directs that the information, procedures and instructions in the operations manual be revised or varied in accordance with the proposed amendments, or the proposed amendments as varied by CASA.

11 Visibility

For an NVG operation, if in-flight visibility of 5 000 m cannot be maintained at, or above, 500 ft above terrain or obstacles, the pilot in command must:

(a) alter the flight path direction if this would:
   (i) avoid low visibility areas; and
   (ii) maintain the minimum visibility of 5 000 m; or
(b) climb to at least the LSALT and revert to use of NVFR or I.F.R. procedures instead.

12 Close proximity flights

12.1 In this subsection:

   close proximity for a flight, means a minimum separation of:
   (a) 250 metres horizontally; and
   (b) 500 ft vertically.

12.2 The pilot in command of a helicopter conducting an NVG operation may only fly in close proximity to another aircraft if the flight is:

(a) in accordance with the operator’s operations manual; and
(b) arranged and discussed with the pilot in command of the other aircraft before the close proximity flight begins.

Note The separation minima do not apply for the pilot during the take-off or landing phase of flight with respect to aircraft already on the ground or during take-off or landing.

Part 4 — Recognised NVG qualifications for NVG operations

13 Chief pilot

An NVG operator’s chief pilot must hold:

(a) an NVG pilot qualification and be a pilot in command; or
(b) a CASA instrument of approval stating that a named NVG senior pilot appointed by the operator is approved by CASA to carry out the duties of chief pilot for NVG operations.
14 NVG testing officer

14.1 An NVG testing officer must hold at least an initial NVG pilot qualification in accordance with this Order and an instrument of appointment from CASA.

14.2 CASA may appoint an NVG testing officer only after an NVG flight test conducted by an NVG FOI or other person approved by CASA.

15 NVG flight instructor

15.1 Only an NVG flight instructor, approved by CASA on application, may instruct a pilot for initial NVG pilot qualification.

15.2 An NVG flight instructor may not award, or renew, an NVG endorsement unless he or she is also an NVG testing officer.

15.3 CASA may issue an NVG flight instructor approval only after a flight test.

15.4 A person must, as a minimum, have the following qualifications and experience for eligibility to be approved as an NVG flight instructor:

(a) the minimum qualification requirements of an NVG pilot in command;

(b) a current grade 1 or grade 2 flight instructor (helicopter) rating;

(c) a night training approval (or recognised overseas equivalent);

(d) an NVG training approval issued by CASA;

(e) at least 250 hours of helicopter flight instruction;

(f) after receiving an NVG qualification — at least 40 hours of NVG flight as 1 or more of the following:

   (A) an NVG pilot in command;

   (B) an NVG pilot in command under supervision (known as ICUS);

   (C) an NVG pilot under post initial qualification dual instruction by an NVG flight instructor;

(g) the minimum experience requirements of the Civil Aviation Orders to give flight instruction on the relevant aircraft type;

(h) successful completion of an NVG flight instructor flight test conducted by an NVG testing officer, or an NVG FOI, appointed to conduct such tests.

Note: Aircrew members are currently used in a large variety of ways by operators and there is no existing standardisation regarding their qualifications. Accordingly, guidance for the qualifications of NVG aircrew member instructors is set out in CAAP 174-1 (0).

16 NVG qualified pilot

A person must, as a minimum, hold the following qualifications and experience for eligibility to be an NVG qualified pilot:

(a) a current commercial helicopter pilot licence;

(b) a night V.F.R. rating;
successful completion of NVG pilot qualification training and testing under this Order, or its equivalent based on recognition of training and experience under clause 10 of this Appendix;

(d) an appropriate endorsement for the relevant aircraft type;

(e) a total of 20 hours night V.F.R. (unaided) as a helicopter pilot;

(f) a total of 10 hours as pilot in command at night (unaided) post-NVFR rating (for command pilots) or at least 10 hours night (unaided) experience (for co-pilots).

17 NVG training and checking pilot

17.1 Unless CASA approves otherwise in writing, a person must, as a minimum, hold the following qualifications and experience for eligibility to be an NVG training and checking pilot:

(a) the minimum qualifications required of an NVG pilot or NVG flight instructor;

(b) 40 hours NVG flight time as a pilot in command after obtaining his or her NVG pilot qualification;

(c) a night checking and training approval in accordance with the training and checking manual.

17.2 CASA may issue an NVG training and checking pilot approval only after a flight test unless CASA considers that a flight test is not required.

17.3 An NVG training and checking pilot may give NVG flight instruction to a non-NVG endorsed pilot only if he or she is approved by CASA as an NVG flight instructor.

18 Aircrew members and aircrew member instructors

18.1 Unless CASA otherwise directs in writing, eligibility for NVG qualifications for an aircrew member, or an aircrew member instructor, must be set out in the operator’s operations manual accepted by CASA.

18.2 An operator may only use an NVG aircrew member to fulfil the minimum NVG crew requirements if the person’s duties and position are formally recognised in the operator’s operations manual.

18.3 An operator must establish in the operations manual qualification and proficiency requirements for aircrew members and aircrew member instructors, using at least the minimum competencies established by this Order.

Part 5 — Recency requirements for NVG operations

19 General requirements

Before commencing an NVG operation, each NVG pilot and NVG aircrew member must meet the requirements of:

(a) this Part; and

(b) for an NVG pilot — subsection 9 of Civil Aviation Order 40.2.2; and
(c) any requirements in the operator’s operations manual for the relevant NVFR operation.

20 I.F.R. requirements

Before commencing a flight under the I.F.R., with the intention of changing to flight under the NVFR for an NVG operation, each NVG pilot and NVG aircrew member must meet:

(a) the requirements of this Part 5; and
(b) all I.F.R. recent experience requirements (currencies) for the relevant flight, including approach currencies in accordance with subsection 11 of Civil Aviation Order 40.2.1.

21 Minimum recency requirements — NVG pilot

An NVG pilot must meet the following minimum recency requirements or an NVG CCF must be undertaken:

<table>
<thead>
<tr>
<th>NVG flight time</th>
<th>Less than 100 hours NVG flight time as a pilot</th>
<th>More than 100 hours NVG flight time as a pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVG CCF</td>
<td>6 monthly</td>
<td>annually</td>
</tr>
</tbody>
</table>

For additional tasks or roles specific to a permitted NVG operation

Note: For these recency requirements, the pilot must be using NVG (i.e. be goggled-up).
22 Minimum recency requirements — NVG aircrew member

An NVG aircrew member must meet the following minimum following recency requirements or an NVG CCF must be undertaken:

Table 22.1 — Minimum NVG aircrew member recency requirements

<table>
<thead>
<tr>
<th>NVG flight time</th>
<th>Less than 50 hours NVG flight time</th>
<th>More than 50 hours NVG flight time</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVG CCF</td>
<td>6 monthly</td>
<td>annually</td>
</tr>
<tr>
<td>For additional tasks or roles specific to a permitted NVG operation</td>
<td>NVG recency requirements in accordance with the operator’s operations manual and acceptable to CASA</td>
<td>NVG recency requirements in accordance with the operator’s operations manual and acceptable to CASA</td>
</tr>
</tbody>
</table>

Note: For these recency requirements, the aircrew member must be using NVG (i.e. goggled-up).

23 NVG CCF

23.1 The requirements for an NVG CCF may be met:

(a) for an NVG pilot — by 1 of the following:

(i) an initial endorsement of the NVG qualification;

(ii) a successful NVG CCF;

(iii) an NVG flight instructor flight test;

(b) for an NVG aircrew member — by an initial endorsement of the NVG qualification or a successful NVG CCF.

23.2 An NVG CCF for an NVG pilot must:

(a) be conducted in accordance with clause 13 of Appendix 1; and

(b) involve an NVG flight that is representative of the operator’s typical NVG mission profile; and

(c) be a minimum of 1 hour NVG flight time; and

(d) require the candidate to demonstrate competency in all of the following:

(i) NVG unit failure for each of the crew members;

(ii) NVG single tube failure for each of the crew members;

(iii) procedures for utilising backup power to the NVG;

(iv) circuit operations to HLS-NVG basic located in areas devoid of HLS lighting or surrounding cultural lighting;
(v) procedures for loss of visual reference (for example, brownout or whiteout) when visibility is inadvertently lost on departure or arrival to, or over, a HLS;

(vi) procedures for in-flight deteriorating visibility situations;

(vii) inadvertent I.M.C. penetration and recovery to V.M.C. flight;

(viii) procedures for wire and obstacle detection and avoidance using white light (for example, from a steerable searchlight or night sun).

23.3 An NVG CCF for an NVG aircrew member must:

(a) be conducted in accordance with clause 13 of Appendix 1; and

(b) involve an NVG flight that is:

(i) of at least 1 hour duration; and

(ii) representative of the operator’s typical NVG mission profile; and

(c) as a minimum, require the candidate to demonstrate competency in all of the following:

(i) NVG unit failure for each of the crew members;

(ii) NVG single tube failure for each of the crew members;

(iii) procedures for utilising backup power to the NVG;

(iv) circuit operations to HLS-NVG basic located in areas devoid of HLS lighting or surrounding cultural lighting;

(v) procedures for loss of visual reference (for example, brownout or whiteout) when visibility is inadvertently lost on departure or arrival to, or over, a HLS;

(vi) procedures for deteriorating in-flight visibility situations;

(vii) recovery to V.M.C. flight after inadvertent I.M.C. penetration;

(viii) procedures for wire and obstacle detection and avoidance using white light (for example, from a steerable searchlight or night sun).

Note An NVG CCF for an NVG aircrew member may only be conducted by an NVG pilot if he or she is an NVG training and checking pilot who is also an NVG aircrew member instructor. An NVG CCF for an NVG aircrew member may only be conducted in accordance with the operator’s operations manual.

Part 6 — Minimum requirements for NVG qualification training

24 Requirements for training courses

An NVG initial qualification training course must:

(a) be approved by CASA; and

(b) be conducted by a TCO or NVG training provider and

(c) as a minimum, meet the requirements of this Part.

Note Operators should build extra requirements into training syllabuses to satisfy any advanced operational sequences relevant to their operation, for example, specialised coastal rescue, winching, rappelling.
25   NVG pilot training course approval

25.1 CASA may only approve an NVG pilot training course which is designed to achieve at least the competency outcome described in subclause 25.2.

25.2 At the end of the course, the trainee is able to perform the duties of an NVG pilot to safely and effectively take off, fly and navigate en route across country, and descend, reconnoitre and land or hover to a HLS-NVG basic devoid of HLS lighting or surrounding cultural lighting using NVG.

Note 1 Although some operators may not require NVG operations to HLS-NVG basic, this remains a basic competency requirement of any qualification course to meet the contingency of having to use NVG to force-land en route in the event of deteriorating in-flight conditions or emergency malfunctions.

Note 2 An example of an NVG pilot training course meeting this competency is provided in CAAP 174-1 (0).

26   NVG aircrew member training course approval

26.1 CASA may only approve an NVG aircrew member training course which is designed to achieve at least the competency outcome described in subclause 26.2.

26.2 At the end of the course, the trainee is able to perform the duties of an NVG aircrew member to safely and effectively assist an NVG pilot to take off, fly and navigate en route across country and descend, reconnoitre and land or hover to a HLS-NVG basic devoid of HLS lighting or surrounding cultural lighting using NVG.

Note 1 It is recognised that many operators will have a requirement for the aircrew member to fulfill other duties outside the provision of basic scan sector observation, for example, aided winching, or advanced cockpit duties (as detailed in the CAAP) while aided. As these competencies are not covered by the stated training competency outcome above, those operators should add instructional sequences and flight time to these basic minimums to achieve those competencies.

Note 2 An example of an NVG aircrew member training course meeting this competency is provided in CAAP 174-1 (0).

27   Ground training

27.1 Before any NVG initial flight training may commence, initial NVG qualification training must include a CASA approved NVG ground theory training course of at least 6.5 hours followed by a written examination to certify competency.

27.2 NVG ground theory subjects must, as a minimum, cover the following:

(a) applicable CAO, CAAP and operations manual contents that relate to NVG regulations, limitations and flight operations;

(b) NVG system technical description, functions, limitations and maintenance, including normal, abnormal and emergency operations;

(c) aero medical and human factors considerations with NVG, including limitations, spatial and vision illusions, eye adaptation, perception limitations, stressors and fatigue;

(d) environmental considerations, including moon data, illumination, atmospherics, weather, shadow and moisture;
(e) NVG navigation and flight planning including terrain interpretation and obstacle avoidance;

(f) crew co-ordination principles, procedures and phraseology for NVG operations;

(g) risk management awareness based on the Australian Standard AS/NZS 4360:2004.

28 NVG flight training qualifications

28.1 NVG flight training for initial NVG pilot and initial NVG aircrew member qualifications must be approved by CASA.

28.2 Initial NVG pilot training may be conducted concurrently with NVG aircrew member training if proper allowance is made for time lost to individual trainees on the same flight.

29 Initial NVG pilot flight training — prerequisites

Before commencing NVG training for an initial NVG pilot qualification, a trainee pilot must, as a minimum, meet the following requirements:

(a) hold a current commercial pilot (helicopter) licence or air transport pilot (helicopter) licence;

(b) hold a current night V.F.R. rating for helicopters;

(c) have logged at least 250 hours of aeronautical experience as a helicopter pilot of which no more than 50 may be in an approved flight simulator representative of the aircraft category that will be used for NVG operations;

(d) be appropriately endorsed on the aircraft type intended for training;

(e) have logged at least 10 hours as pilot in command at night (unaided) post NVFR rating (for command pilots) or at least 10 hours at night (unaided) experience (for co-pilots) and, in either case, ensured that 3 of the hours are in the 3 months immediately before the initial award of the NVG endorsement;

(f) either:

(i) hold a current command helicopter instrument rating; or

(ii) have completed at least 10 hours of dedicated dual instrument training of which:

(A) not more than 5 hours may be in a synthetic flight trainer; and

(B) at least 3 hours must be completed in a helicopter in the 3 months immediately before commencing NVG training, to a degree which ensures proficiency in the requirements specified in paragraphs 2.1 (a) and (c) of Appendix 1 in CAO 40.2.2, to the standard specified in clause 2.2 of that Appendix; and

(C) some time must be spent to a degree which ensures proficiency in recovery to V.M.C. flight after inadvertent I.M.C. penetration;
(g) if undergoing NVG training for an advanced operational sequence, for example, winching — be qualified and certified for the advanced operational sequence unaided before undergoing the NVG training;

(h) if the trainee pilot, during or after training, is to conduct low flying — have successfully completed low flying training and had his or her log book endorsed accordingly.

30 Initial NVG pilot flight training — requirements

30.1 NVG flight training for the initial NVG pilot qualification must include at least 5 hours of NVG flight time, exclusive of the NVG flight test mentioned in paragraph 14 (1) (a) of Appendix 1.

30.2 Flight training must:

(a) be conducted in at least 4 separate flights; and

(b) expose the trainee to at least 1 flight in low illumination conditions, for example, with little or no moon in an area devoid of surrounding cultural lighting.

Note The requirement for separate flights is to emphasise the importance of the pre-flight planning and goggle adjustment phases.

30.3 NVG flight training may be conducted in an approved Level D NVG flight simulator.

Note 1 The flight test is not NVG training. The flight test may not be conducted in a flight simulator.

Note 2 Instrument rating credits for approved flight simulators are set out in Part 1 of Appendix II in CAO 40.2.1.

30.4 Flight training must include development of competency in at least the following subjects:

(a) preparation and use of internal and external aircraft lighting systems for NVG flights and operations;

(b) pre-flight preparation of NVG, planning considerations, and appropriate route selection for NVG flights and operations;

(c) correct piloting techniques (during normal, abnormal and simulated emergency aircraft operations) while using NVG during the take off, climb, en route, descent and landing phases of flight;

(d) normal, abnormal and emergency operations of the NVG during flight;

(e) loss of visual reference procedures on landing and take off;

(f) procedures for deteriorating in-flight visibility situations;

(g) in-flight simulated recovery to V.M.C. with sole reference to the aircraft instruments after inadvertent I.M.C. penetration;

(h) sound crew co-ordination;

(i) procedures for wire and obstacle detection and avoidance using white light (for example, from a steerable searchlight or night sun).
31 **NVG pilot — flight testing**

A flight test for the initial NVG pilot qualification must be at least 1.5 hours in duration and the candidate must, as a minimum, demonstrate competency in the following:

(a) mission planning and flight planning for the flight including a sound knowledge of the rules, regulations and operations manual instructions relating to NVG;

(b) determining the serviceability of NVIS equipment, including aircraft components;

(c) performing cockpit drills including switch selection and goggle/de-goggle procedure;

(d) performing hover, taxi and transit procedures;

(e) performing crew resource management appropriate to NVIS operations;

(f) performing NVIS practice malfunctions and emergency procedures;

(g) performing NVIS departure and navigation;

(h) performing circuit operations to HLS-NVG basic located in areas devoid of HLS lighting or surrounding cultural lighting using NVG;

(i) performing loss of visual reference procedures on landing and take off;

(j) performing procedures for flight into deteriorating in-flight visibility situations;

(k) performing procedures for safe recovery to V.F.R. flight following inadvertent entry to I.M.C.;

(l) performing a selection of practice aircraft emergency procedures under NVIS conditions applicable to the aircraft type;

(m) performing wire and obstacle detection and avoidance procedures using white light (for example, from a steerable searchlight or night sun).

32 **NVG aircrew member flight training — prerequisites**

Before commencing NVG training leading to the award of an operator specific NVG qualification, the trainee aircrew member must have the following minimum qualifications and experience:

(a) the experience, recency, and qualifications stipulated in the relevant operator’s operations manual for day and night (unaided) operations for the relevant crew position and aircraft type;

(b) the physical and medical standards stipulated by the operator’s operations manual;

(c) at least 50 hours flight time as an aircrew member in a form that is acceptable to the operator as set out in the operator’s operations manual;

(d) at least 5 hours helicopter night (unaided) flight time as an aircrew member in the 3 months leading up to commencement of the training;

(e) the qualifications and certification required, in accordance with the operator’s operations manual and any relevant Civil Aviation Order, for any
advanced operational sequences, for example, winching, before undergoing NVG training for that sequence.

33 NVG aircrew member flight training — requirements

33.1 NVG flight training for the initial NVG aircrew member qualification must include at least 2 hours of NVG flight time.

33.2 Flight training must:

(a) be conducted in at least 2 separate flights; and

(b) expose the trainee to at least 1 flight in low illumination conditions, for example, with little or no moon in an area devoid of surrounding cultural lighting; and

(c) take into account the requirements of paragraph 8 in Part 3 of Appendix 3 of CAAP 174-1 (O).

Note The requirement for separate flights is to emphasise the importance of the pre-flight planning and goggle adjustment phases.

33.3 Flight training may be conducted in an approved NVG flight simulator.

Note The competency assessment flight test is not training and may not be conducted in a flight simulator.

33.4 Flight training must include development of competency in at least the following subjects:

(a) preparation and use of internal and external aircraft lighting systems for NVG flights and operations;

(b) pre-flight preparation of NVG and an understanding of planning considerations and appropriate route selection for NVG flights and operations;

(c) the rules, regulations and operations manual instructions relating to NVG;

(d) using NVG to accurately recognise, identify, announce and provide verbal correction (“the con”) to the pilot for drift, rates of climb and descent, obstacle avoidance and ground hazards, including dust or debris, during NVG take off and landing phases;

(e) loss of visual reference procedures on take off and landing;

(f) procedures for flight into deteriorating in-flight visibility situations;

(g) assisting the pilot during in-flight safe recovery to V.F.R. flight following simulated inadvertent entry to I.M.C.;

(h) sound crew co-ordination;

(i) procedures for wire and obstacle detection and avoidance using white light (for example, from a steerable searchlight or night sun).

34 NVG aircrew member — flight testing

In a flight test for the initial NVG aircrew member qualification, the candidate must, as a minimum, demonstrate competency in the following:

(a) assisting the pilot in mission planning and flight planning;
(b) determining the serviceability of NVIS equipment, including aircraft components;
(c) performing cockpit drills including switch selection and goggle/de-goggle procedure;
(d) performing crew resource management appropriate to NVIS operations;
(e) performing NVIS practice malfunctions and emergency procedures;
(f) performing aircrew member duties for descent, reconnaissance and circuit operations to HLS-NVG basic located in areas devoid of HLS lighting or surrounding cultural lighting using NVG;
(g) providing a timely and accurate “con” to the pilot for drift, rates of climb and descent, obstacle avoidance and ground hazards, including dust and debris;
(h) assisting the pilot during procedures for flight into deteriorating in-flight visibility situations;
(i) assisting the pilot during in-flight safe recovery to V.F.R. flight following simulated inadvertent entry to I.M.C.;
(j) performing wire and obstacle detection and avoidance procedures using white light (for example, from a steerable searchlight or night sun).
Attachment 1 to Appendix 3

Performance Standards for Night Vision Imaging Systems

Modifications of RTCA/DO 275

In this Attachment, each item in column 3 of the Table shows how a relevant operational performance specification in the corresponding paragraph of RTCA/DO-275 mentioned in column 1 and summarised in column 2 is modified.

List of modifications to RTCA/DO-275

<table>
<thead>
<tr>
<th>RTCA/DO-275</th>
<th>Amended performance requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Para 2.2.1.1 System Resolution</td>
<td>1.0 cycles per milliradian (cy/mr). At 14° off axis = 0.81 cy/mr With a variable focus @ through infinity = 0.49cy/mr</td>
</tr>
<tr>
<td></td>
<td>1.3 cy/mr</td>
</tr>
<tr>
<td>Para 2.2.1.2 System Luminance Gain</td>
<td>= 2,500 foot-Lamberts (fL) per fL at an input light level of 1 x 10^-4 fL</td>
</tr>
<tr>
<td></td>
<td>= 5 500 foot-Lamberts (fL) per fL at an input light level of 1 x 10^-6 fL</td>
</tr>
<tr>
<td>Para 2.2.1.3 Field-of-View</td>
<td>38° vertical and horizontal</td>
</tr>
<tr>
<td>Para 2.2.1.4 Magnification</td>
<td>1:1 +/− 2%</td>
</tr>
<tr>
<td>Para 2.2.1.7.1 Spectral Transmission</td>
<td>Meet Class B filter requirements</td>
</tr>
<tr>
<td>Para 2.2.1.10 Eyepiece Dioptr Range</td>
<td>Adjustable +1.0 to −2.0, or Fixed −0.5 and −1.0</td>
</tr>
<tr>
<td>Para 2.2.1.12 Objective Focus Range</td>
<td>Adjustable from beyond infinity to no greater than 45 cm close range</td>
</tr>
<tr>
<td>Para 2.2.13 Exit Pupil/Eye Relief</td>
<td>Type I − 25 mm, Type II − 20mm</td>
</tr>
<tr>
<td>Para 2.2.2.3 Flip-Up/Flip Down</td>
<td>Required capability</td>
</tr>
<tr>
<td>Para 2.2.2.4 Fore-and-Aft Adjustment</td>
<td>Sufficient to align with users eyes</td>
</tr>
<tr>
<td>Para 2.2.2.4 Tilt Adjustment</td>
<td>Sufficient to align with users eyes</td>
</tr>
<tr>
<td>Para 2.2.2.5 Interpupillary Adjustment</td>
<td>Desired but not required. If not installed, exit pupil must be large enough to see full FOV</td>
</tr>
<tr>
<td>Para 2.2.2.6 Voltage Required</td>
<td>2.7 − 3.0 V DC 50mA nominal Backup power supply required</td>
</tr>
<tr>
<td>Technology</td>
<td>Intensifier tubes not specified</td>
</tr>
<tr>
<td>Photosensitivity</td>
<td>Not specified</td>
</tr>
<tr>
<td>Tube Resolution</td>
<td>Not specified</td>
</tr>
<tr>
<td>Signal to Noise Ratio</td>
<td>Not specified</td>
</tr>
</tbody>
</table>
Explanatory Statement

Civil Aviation Act 1988

Civil Aviation Order 82.6 Instrument 2006

Purpose
Civil Aviation Order 82.6 (the CAO) establishes operational and airworthiness standards and approval requirements for the use of night vision goggles (NVG) in specialised helicopter aerial work operations. The CAO has the effect of making unlawful any unapproved use of NVG as a primary means of terrain avoidance for safe air navigation by means of visual surface reference external to an aircraft. The CAO is an interim measure pending finalisation of Part 133 of Civil Aviation Safety Regulations 1998 which will cover rotorcraft operations generally and is still under development.

Background
NVG are a head mounted night vision enhancement device. They consist of a binocular imaging unit, with associated power and counterbalance fitments, which uses image intensifying technology to amplify the available ambient light (including low levels of moonlight or starlight) sufficiently for images to be seen through the NVG eyepieces as a monochromatic green image.

NVG technology evolved mainly in advanced military forces, including in Australia. In certain strictly controlled circumstances, the use of NVG can enhance crew situational awareness and improve overall flight safety under night visual flight rules (NVFR). As a result of helicopter industry demand and overseas developments in the use of NVG for civilian helicopter operations, CASA has established a trial to facilitate the use of NVG in certain public interest helicopter operations.

The trial is for permitted NVG operations, namely search and rescue, law enforcement, aerial fire fighting, aerial fire fighting support, emergency medical services, marine pilot transfers, training for any of these, and demonstration and positioning flights.

Flight safety implications
Although operational safety advantages are gained from proper use of NVG, there are limitations and associated risks which must be minimised. These include decreased visual acuity, much reduced field of view, degraded object recognition, degraded depth perception and distance estimation due to the monochromatic image effect and lack of contrast.

There are also other human factor aspects that are particularly important at lower altitudes when flying over featureless terrain or over water, for example, estimating closure rates to obstructions, sighting of power lines or estimating closure rates when in close proximity to other aircraft.

Weather conditions, including the amount of moonlight or other ambient light available, may affect, and possibly degrade, the operational safety of NVG. The presence of rain or high humidity produces a “flecking” in the eyepieces and degrades
NVG performance. Aircraft modifications are required to ensure that internal and external lighting is NVG-compatible to prevent NVG degradation. At the same time, it is essential that warning and caution lights are readily visible to the crew without NVG degradation.

Crew procedures must reflect the higher than usual degree of human factors and crew resource management awareness and training required for NVG operations. Crew fatigue is higher than normal due to the physiological limitations of extensive night operations, and the higher workload and concentration levels required for NVG flight. The risk of spatial disorientation is increased because of decreased visual input and decreased peripheral vision which is normally very important in vertical and low speed flight.

Strict procedures must eliminate the potential for operator and crew complacency, overconfidence and overestimation of the capabilities of NVG. Equally, it is essential to ensure that the proficiency and currency of the specialised flying skills required for NVG operations are maintained.

**Risk mitigation**
The risks associated with NVG operations can be mitigated by limiting operations to certain specialised areas of public interest, excluding non-essential occupants, and requiring proper NVG training, NVG-compatible lighting modifications, recency training, ongoing airworthiness standards and sound operating procedures. These safety requirements are provided for in the CAO.

The CAO permits NVG operations only by a specialised part of the aviation industry and only under strict conditions imposed in the interests of safety. Any other use of NVG for operational purposes is prohibited. CASA Instrument 30/07 (made on 15 February 2007) was issued as a direction under subregulation 209 (1) of the *Civil Aviation Regulations 1988* (*CAR 1988*) that night vision devices (*NVDs*) may not be used in private operations as the primary means of terrain avoidance by external visual surface reference. Subsection 3D of CAO 82.0 (inserted on 15 February 2007) made it a condition of an AOC that NVD may only be used as the primary means of terrain avoidance by external visual surface reference if CASA has approved the use.

**The 12 month trial of NVG**
To ensure the legislation meets the operational requirements of civil operators in Australia, the CASA 12 month trial of NVG will involve regular joint CASA/industry meetings to review progress and developments. International aviation safety regulators with expertise in NVG have been invited to observe at the review meetings. This aspect of the trial will allow the operational standards and legal rules to be fine-tuned before being incorporated in CASR Part 133.

**Legislation**
Section 98 of the *Civil Aviation Act 1988* (the *Act*) empowers the Governor-General to make regulations for the Act and the safety of air navigation.

**Current regulatory framework — CAR 1988**
Under subregulation 5 (1) of CAR 1988, where CASA is empowered to issue certain instruments, it may do so in a Civil Aviation Order.
Under subregulation 157 (1) of CAR 1988, the pilot in command of an aircraft must not fly over a city, town or populous area at a height lower than 1 000 feet, or over any area at a height lower than 500 feet.

Under subregulation 174B (1) of CAR 1988, except for take-off and landing, the pilot in command of an aircraft must not fly it at night under the visual flight rules (V.F.R.) at a height of less than 1 000 feet above the highest obstacle within 10 miles.

Under subregulation 195 (1) of CAR 1988, at night and in conditions of poor visibility, the operator and pilot in command of an aircraft must comply with the rules in Part 13 of CAR 1988 about the lights to be displayed for the aircraft.

Under subregulation 207 (2) of CAR 1988, a person must not use an Australian aircraft in a class of operation if the aircraft is not fitted with the instruments and equipment approved and directed by CASA. In approving or directing, CASA may have regard only to the safety of air navigation.

Under subregulation 215 (3) of CAR 1988, CASA may give directions requiring an operator to include, revise or vary information, procedures or instructions in the operations manual (operating procedures).

Under subregulations 217 (1) and (3) of CAR 1988, CASA may specify operators who must provide an approved training and checking organisation (a TCO) to ensure that members of the operator’s operating crews maintain their competency.

Under subregulation 249 (1) of CAR 1988, the pilot in command of an aircraft must not practice emergency procedures or fly low when carrying a passenger.

Under subregulation 308 (1) of CAR 1988, in relation to particular aircraft or categories of aircraft, CASA may exempt the aircraft, or persons in, on, or otherwise associated with the operation of, the aircraft, from compliance with specified provisions of CAR 1988. Under subregulation 308 (2), before making an exemption, CASA must take relevant safety considerations into account. Under subregulation 308 (3), CASA may make an exemption subject to necessary safety conditions.

Under section 27 of the Act, CASA may issue Air Operators’ Certificates (AOCs) for its functions. Under subsections 27 (2) and (9) of the Act, an aircraft operator must hold an AOC in order to operate for certain prescribed purposes. Paragraph 206 (1) (a) of CAR 1988, prescribes aerial work purposes of various kinds, including aerial spotting, flying training, ambulance functions, and purposes that are substantially similar to these. Substantially similar purposes are generally taken to include search and rescue, law enforcement, aerial fire fighting and marine pilot transfers.

Under paragraph 28BA (1) (b) of the Act, an AOC has effect subject to, among other things, conditions specified in Civil Aviation Orders.

The CAO
The CAO is designed to regulate a 12 month trial of NVG with selected suitable operators and, at the end of the trial, CASA will assess its outcomes in consultation.
with the participants and decide how best to proceed in relation to the future use of NVG.

**Transitional provisions**
Before this CAO, CASA controlled the approved use of NVG firstly, through a *Compliance Management Instruction 04/74 — Night Vision Goggles (NVG) for Helicopter Operations* (the CMI) and secondly, since February 2007, for holders of Air Operator Certificates through subsection 3D of CAO 82.0. Because approvals could be issued at field office level, there is some uncertainty whether any approvals were actually issued (in the form of low flying permissions under subregulation 174B (4) of CAR 1988). Following thorough checks, CASA has no record, and is not aware, of any approvals having been given under the authority of the CMI. However, as a precaution, if approvals were issued, they are revoked by the CAO. The CMI has also been revoked administratively.

**Definitions**
Part 1 of Schedule 1 of the CAO provides definitions of various terms used in the CAO.

**NVG operations**
In light of NVG operational requirements, and the requirements of existing civil aviation legislation, safe NVG operations require various directions and exemptions. The CAO provides for these in Part 2 of Schedule 1.

**Private operations**
An existing subregulation 209 (1) direction (CASA 30/07) makes it a condition of all private operations that NVD (i.e. any form of night vision device) must not be used as the primary means of terrain avoidance during those operations.

**Instruments and equipment**
Under subregulation 207 (2) of CAR 1988, for the CAO, CASA approves NVG that comply with all of the equipment requirements of the CAO, and directs use of NVG only in accordance with the CAO.

**Operations manuals**
Under subregulations 215 (3) of CAR 1988, the CAO contains directions for operators to include certain material in their operations manuals and manuals containing this material will need to be approved by CASA.

**Provision of a TCO**
Under subregulations 217 (1) and (3) of CAR 1988, the CAO specifies that each NVG operator must provide a TCO for NVG initial training (i.e. for initial qualification) unless the training is provided by an approved NVG training provider (i.e. an approved provider of NVG initial training inside or outside Australia).

If the operator does not use a TCO, or an NVG training provider for NVG initial training, the operator itself may only conduct non-initial training (i.e. training for proficiency) and then only if the operations manual specifies the line and role training requirements for such training.
Exemption — V.F.R. flights at night
Under subregulation 308 (1) of CAR 1988, the CAO exempts certain pilots in command of helicopters from the restriction in subregulation 174B (1) of CAR 1988 that, except for take-off and landing, the pilot must not fly it at night, under the visual flight rules (V.F.R.), at a height of less than 1 000 feet above the highest obstacle within 10 miles.

The exemption only applies for NVG helicopter search and rescue, law enforcement, aerial fire fighting or emergency medical services operations, or for NVG proficiency or positioning flights for one of these operations, or for NVG initial training. The NVG must be used in accordance with the CAO and it must be operationally necessary to fly below the relevant LSALT that would otherwise apply. The exemption does not apply to NVG marine pilot transfers, NVG aerial fire fighting support or NVG demonstration flights.

Exemption — navigation lights
Under subregulation 308 (1) of CAR 1988, the CAO exempts the operator and the pilot in command of a helicopter in an NVG operation from a lighting requirement of Part 13 of CAR 1988 provided he or she is complying with any lighting requirement of the CAO that is at variance with Part 13.

AOC conditions
Under Part 3 of Schedule 1 of the CAO, a condition is imposed on all AOC holders to comply with the CAO if and when using NVG. Only an NVD that complies with the CAO may be used and only in accordance with the CAO and the operator’s operations manual.

If a TCO or a training provider is approved to use NVG for initial training, the TCO or the provider must have an NVG approval that authorises NVG flying training.

CASA will only give NVG approvals to AOC holders under the CAO and will no longer issue any approvals under Compliance Management Instruction 04/74 — Night Vision Goggles (NVG) for Helicopter Operations.

Restricted use of NVG
Under Appendix 1 of Schedule 1 of the CAO, NVG operators must have a risk assessment, an operations manual that complies with the directions in the CAO and CASA’s written approval to use NVG in a permitted operation for the trial.

An approved operator must make certain quarterly reports to CASA about NVG operations and any safety issues or incidents.

Permitted NVG operations may only be conducted under the V.F.R. and at, or above, the LSALT unless permitted otherwise under the CAO.

An NVG approval may be suspended or revoked if the operator fails to comply with the CAO or the operations manual.
NVG qualifications
NVG qualifications are for an NVG pilot, an NVG chief pilot, an NVG testing officer, an NVG flight instructor, an NVG training and checking pilot, an NVG aircrew member instructor and an NVG aircrew member.

Before commencing NVG training, a person must meet certain prerequisites. Initial training may only be conducted by a TCO or an approved provider; non-initial training may only be conducted by an NVG flight instructor or a person approved by CASA and acting in accordance with the operations manual.

An NVG pilot qualification is in the form of a log book endorsement made by CASA, or an NVG testing officer, following successful completion of training and competency assessment.

Similar arrangements apply for NVG aircrew member qualifications. The log book endorsement may only be made after the applicant has been assessed and the NVG training syllabus has been approved by CASA.

An endorsement may be based on recognition of foreign training and experience subject to regulatory knowledge and a local flight test with an NVG testing officer or an NVG flying operations inspector (NVG FOI).

CASA may accept that a flight test conducted in a country outside Australia by an NVG training provider meets the above requirements if the person gives CASA persuasive written evidence that the relevant competencies have been demonstrated in the flight test. Persuasive evidence is normally a statement, signed by a person approved for NVG testing by the country’s national airworthiness authority, recording that each of the competencies has been demonstrated.

Capability check flights and flight tests
For an operation requiring a person to have a particular NVG qualification, the person must have competency, recency and capability in terms of capability check flight requirements in accordance with the CAO and the operator’s operations manual. Specific rules deal with who may conduct these checks and other test flights.

Contents of the operations manual
Under Part 1 of Appendix 2 of Schedule 1, the CAO directs operators conducting NVG operations to have in their operations manuals, as a minimum, the information, procedures and instructions required by Part 2 of Appendix 2, in the detail and to a standard acceptable to CASA.

The directions deal with NVG training programs, airworthiness and maintenance, NVG flight operations (including planning, crew composition and weather), operating phraseology and emergency procedures.

Equipment, operations, qualifications and training
Appendix 3 of Schedule 1 of the CAO contains standards for NVG equipment and operations, and for NVG training and qualifications.
Under Part 1 of Appendix 3, aircraft lighting systems must be NVG compatible and based on specific standards. In certain circumstances, exterior helicopter lighting must be modified or risk management plans prepared to address this.

NVG equipment itself must meet specific standards stipulated by CASA.

**NVG operations**

Certain NVG operational flights may fly below the LSALT that would otherwise apply if this is operationally necessary. However, the pilot in command in an NVG positioning flight must not fly over a city, town or populous area at a height lower than 1 000 ft above ground level (AGL) or over an unpopulated area at a height lower than 500 ft above ground level. (This requirement does not apply if through stress of weather, or any other unavoidable cause, it is essential that a lower height be maintained.)

**Carriage of persons**

There are restrictions on occupants who may be carried on a helicopter during an NVG operation. The only persons who may be carried are members of the flight crew, members of the aircrew, any supernumerary crew, NVG trainees, qualified maintenance personnel present to ensure NVIS equipment is serviceable, and other persons whose presence is necessary for the success or completion of the operation. If the operation is an NVG flight to demonstrate NVG technology, a passenger acceptable to CASA may be carried to observe the demonstration.

**Minimum crew**

There are minimum crew requirements for NVG operations. The minimum NVG crew is not less than the highest crew requirement for NVFR or flight under the instrument flight rules (I.F.R.) if used, that is specified in the aircraft’s flight manual, or the operator’s approved operations manual, or Australian civil aviation legislation, including this Order, that applies to the aircraft.

The minimum NVG crew must also include any additional qualified crew required by the type or class of helicopter or the nature of the operation.

**Flight planning**

Each NVG flight must be planned to comply with NVFR weather minima, alternate aerodrome and fuel requirements. CASA may, on application, grant reduced flight planning weather parameters for specific operations.

**Visibility**

Generally, for an NVG operation in-flight visibility of 5 000 m must be maintained at, or above, 500 ft above terrain or obstacles. If not, the pilot in command must alter the flight path to ensure the minimum visibility of 5 000 m, or climb to at least the LSALT and revert to use of NVFR or I.F.R. procedures instead.

**Close proximity flights**

Close proximity means a minimum separation of 250 m horizontally and 500 ft vertically.
The pilot in command of a helicopter conducting an NVG operation may only fly in close proximity to another aircraft if the flight is in accordance with the operator’s operations manual and arranged and discussed with the pilot in command of the other aircraft before the close proximity flight begins.

**NVG qualifications and experience requirements**

Part 4 of Appendix 3 sets out the detailed NVG and non-NVG qualifications and experience required by a person to be eligible for endorsement as an NVG chief pilot, an NVG testing officer, an NVG flight instructor, an NVG qualified pilot, an NVG training and checking pilot, an NVG aircrew member instructor and an NVG aircrew member.

**NVG recency requirements**

Part 5 of Appendix 3 sets out the minimum recency requirements for both NVG pilots and NVG aircrew before they may participate in an NVG operation.

These recency requirements may be met either by accumulation of specified amounts of flight time within certain time limits or by undergoing an NVG capability check flight (NVG CCF) with an appropriately qualified check pilot or aircrew member.

For additional tasks or roles that may be specific to a permitted NVG operation, additional recency requirements must be acceptable to CASA and in accordance with the operator’s operations manual.

**NVG capability check flights**

The requirements for what constitutes an NVG CCF for an NVG pilot or an NVG aircrew member are set out in the CAO and include flight tests, minimum flight times, demonstrations of competency in carrying out certain procedures or in certain situations (for example, NVG unit failure).

**NVG qualification training**

An NVG initial qualification training course must be approved by CASA and conducted by a TCO or an NVG training provider and, as a minimum, meet the requirements of Part 6 of Appendix 3 of the CAO.

Initial training courses must be designed to achieve certain competency outcomes. Thus, at the end of the course for a trainee pilot, for example, the trainee must be able to perform the duties of an NVG pilot to safely and effectively take off, fly and navigate en route across country, and descend, reconnoitre and land or hover to a basic helicopter landing site (HLS-NVG basic) using NVG.

Similar outcomes are required for an NVG aircrew member training course. At the end of the course, the trainee aircrew member must be able to perform the duties of an NVG aircrew member to safely and effectively assist an NVG pilot to take off, fly and navigate en route across country and descend, reconnoitre and land or hover to a HLS-NVG basic using NVG.

The Civil Aviation Advisory Publication 174-1 (the CAAP) designed to provide advisory guidance for NVG operators and crews provides examples of NVG training courses that meet the requirements of the CAO.
Actual training involves a CASA approved NVG ground theory training course followed by a written examination to certify the CAO, the CAAP and the relevant operations manual contents, NVG systems, functions, limitations and maintenance, aero-medical and human factors, environmental considerations, navigation and flight planning, crew co-ordination and phraseology, and risk management awareness.

Any required flight training for initial NVG pilot and initial NVG aircrew member qualifications must be approved by CASA.

**Prerequisites for initial NVG pilot training**

Before commencing NVG training for an initial NVG pilot qualification, a trainee pilot must meet certain minimum requirements such as holding a current commercial pilot (helicopter) licence or air transport pilot (helicopter) licence, holding a current NVFR rating for helicopters, having logged at least 250 hours of aeronautical experience as a helicopter pilot, having logged at least 10 hours as pilot in command at night (unaided) post NVFR rating (for command pilots) or at least 10 hours at night (unaided) experience (for co-pilots, and holding a current command helicopter instrument rating or having completed at least 10 flight hours of dedicated dual instrument training with an approved instrument instructor.

Training must be designed to develop specific competencies, including in aircraft lighting, pre-flight preparations, correct piloting techniques, emergency operations, loss of visual reference; procedures for deteriorating visibility, simulated recovery to V.M.C. and procedures for wire and obstacle detection and avoidance using white light.

**Flight testing**

In a flight test for the initial NVG pilot qualification, the candidate must demonstrate competency in a range of matters, including flight planning, performing hover, taxi and transit procedures, crew resource management, dealing with NVIS malfunctions and emergencies, circuit operations to HLS-NVG basic located in areas devoid of HLS lighting or surrounding cultural lighting and performing wire and obstacle detection and avoidance procedures.

Similar prerequisites, training goals and flight test competencies are required for aircrew members in terms of assisting the pilot in an NVG operation. In particular, the aircrew member must be trained and competent to provide a timely and accurate “con” (reconnaissance) to the pilot for drift, rates of climb and descent, obstacle avoidance and ground hazards, including dust and debris.

**Legislative Instruments Act**

Under subregulation 5 (1) of CAR 1988, CASA may issue instruments in the form of CAOs. Under subsection 98 (5) of the Act, where regulations provide for an instrument to be issued in the form of a CAO, the CAO so made is declared to be a disallowable instrument. Under subregulation 308 (1) of CAR 1988, an exemption is declared to be a disallowable instrument. Under subparagraph 6 (d) (i) of the *Legislative Instruments Act 2003* (the *LIA*), an instrument is a legislative instrument for section 5 of the LIA if it is declared to be a disallowable instrument under legislation in force before the commencement of the LIA. The CAO is, therefore, a
legislative instrument. It is subject to tabling and disallowance in the Parliament under sections 38 and 42 of the LIA.

Consultation
Consultation under section 17 of the LIA has been undertaken with representatives of helicopter operators, primarily through the Helicopter Association of Australia (the HAA) and other interested industry members. These industry representatives have been actively involved in providing input for, and reviewing the various drafts of, the CAO.

A near final version of the draft CAO was considered in detail in April 2007 when CASA convened a meeting in Sydney with the HAA, other helicopter industry participants and industry observers. The purpose was to consider the then proposed CAO, its draft advisory materials, and the parameters of the 12 month trial. Arrangements for quarterly CASA/industry review meeting were also made.

A Notice of proposed Rule Making (NPRM) for the CAO was published for public consultation on 15 June 2007 and closed on 16 July 2007. No comments were received, largely because of the extensive industry consultation that had preceded the NPRM.

Regulation Impact Statement
The Office of Best Practice Regulation (OBPR) has advised that the CAO may proceed without the preparation of a Regulation Impact Statement. The CAO is intended to establish a 12 month monitored trial of NVG by approved emergency service operators who can meet the safety requirements of the CAO. The CAO places a safety framework around the permitted use of NVG. It is up to an eligible operator to decide whether or not to use NVG and commit to the obligations associated with that. To this extent, the CAO is a machinery provision for which a RIS is not required.

Commencement and making
The instrument comes into effect at the start of the day after it is registered and stops having effect at the end of July 2008.

The instrument has been made by the Acting Director of Aviation Safety, on behalf of CASA, in accordance with subsection 84A (2) of the Act.

[Civil Aviation Order 82.6 Instrument 2007]