CHAPTER 5 RPA OPERATIONS BEYOND VLOS

5.01 Application

(1) This Chapter applies only for RPA operations of a certified RPA operator.

(2) Only a certified RPA operator may be granted an approval under paragraph 101.029 (2) (b) of CASR:

(a) for subparagraph 101.300 (4) (b) (i) — to operate an unmanned aircraft beyond the operator's visual line of sight; or

(b) for subparagraph 101.300 (4) (b) (ii) — for a RePL holder who is a member of the operator's personnel to operate an unmanned aircraft beyond the RePL holder's visual line of sight.

Note An approval would be granted to the certified RPA operator only if the requirements of Chapter 5 are met — see paragraph 101.029 (2) (b) of CASR.

(3) Only a RePL holder:

(a) who is a certified RPA operator holding an approval for paragraph (2) (a); or

(b) who is a member of the personnel of a certified RPA operator holding an approval for paragraph (2) (b);

may be granted an approval under paragraph 101.029 (2) (b) of CASR for subregulation 101.073 (2) to operate an unmanned aircraft beyond the RePL holder's visual line of sight.

Note An approval for a RePL holder would only be granted in association with the grant of a relevant approval for a certified RPA operator.

5.02 Requirements for RPA operations do not apply in certain approved areas

(1) Subject to subsection (2), this Chapter applies to any area that is an area approved by CASA for regulation 101.030 of CASR.

(2) This Chapter does not apply to an EVLOS operation if the area approval permits an EVLOS operation that is in accordance with alternative requirements specified in the approval.

5.03 Requirements for an approval to operate an RPA beyond VLOS

(1) For paragraph 101.073 (2) (a) of CASR, this Chapter prescribes the requirements for the grant of an approval by CASA under paragraph 101.029 (2) (b) of CASR (an ***approval***), for a person to operate an RPA, other than a large RPA, beyond the person's VLOS.

Note See also paragraph 101.300 (4) (b) of CASR.

(2) In this Chapter, the approval mentioned in subsection (1) is referred to as:

(a) an EVLOS operation approval; or

(b) an EVLOS operation class 1 approval; or

(c) an EVLOS operation class 2 approval.

(3) For the grant of an approval, the Certified RPA operator's documented practices and procedures must:

(a) provide for the matters mentioned in this Chapter; and

(b) be in accordance with the requirements of this Chapter; and

(c) ensure that RPA operations are conducted in accordance with the approval.

5.04 Definitions for this Chapter

In this Chapter:

EVLOS means extended visual line of sight.

EVLOS operation class 1 means an RPA operation that is beyond VLOS, and in which:

(a) at least 1 trained visual observer class 1 (the ***observer***) is used; and

(b) the location of the RPA, and the ground beneath and the airspace surrounding, the RPA, is:

(i) located within VLOS for each relevant observer throughout the operation; or

(ii) beyond VLOS but with the relevant observer knowing the exact location of the RPA; and

(c) the observer is in the same location as the remote pilot; and

(d) an FPV system may be used, but not as a substitute for any observer; and

(e) the observer's duty is to:

(i) either:

(A) keep the RPA constantly within VLOS; or

(B) know the exact location of the RPA; and

(ii) maintain constant situational awareness of the airspace surrounding, and the ground below, the RPA; and

(iii) remain in continual, direct, verbal communication with the remote pilot without the use of any device; and

(iv) do the following:

(A) advise the remote pilot if the RPA is likely to become a hazard to any other aircraft, or any person or property;

(B) direct the remote pilot on the action required to ensure that the RPA does not become a hazard to another aircraft, person or property;

(C) immediately direct the safe termination of the operation if:

(I) the exact location of the RPA is lost to the relevant observer's direct sight or knowledge; or

(II) the RPA becomes a hazard to another aircraft, person or property and termination of the operation is the only safe course of action.

Note 1 A flight may be ended by means of controlled flight into terrain, if this is possible without creating a hazard to other aircraft, people or property, and all other options are exhausted.

Note 2 An EVLOS operation extends the distance of operation of an RPA. However, by virtue of the definition, the remote pilot, while operating the RPA using FPV, cannot be the observer for an EVLOS class 1 operation.

EVLOS operation class 2 means an RPA operation that is beyond VLOS in which:

(a) at least 1 trained visual observer class 2 (the ***observer***) is used; and

(b) the RPA, and the ground beneath and the airspace surrounding the RPA, is:

(i) located within VLOS for each relevant observer throughout the operation; or

(ii) beyond VLOS but with the relevant observer knowing the exact location of the RPA; and

(c) the observer is in a different location from the remote pilot; and

(d) an FPV system may be used, but not as a substitute for any observer; and

(e) the observer's duty is to:

(i) either:

(A) keep the RPA constantly within VLOS; or

(B) know the exact location of the RPA; and

(ii) maintain constant situational awareness of the air space surrounding, and the ground below, the RPA operation; and

(iii) remain in continual direct, verbal communication with the remote pilot using an effective communication system; and

Note The system must use reliable modern technology that enables effective spoken communication.

(iv) do the following:

(A) advise the remote pilot if the RPA is likely to become a hazard to any other aircraft, or any person or property;

(B) direct the remote pilot on the action required to ensure that the RPA operation does not become a hazard to another aircraft, person or property;

(C) immediately direct the safe termination of the operation if:

(I) the exact location of the RPA is lost to the relevant observer's direct sight or knowledge; or

(II) the RPA becomes a hazard to another aircraft, person or property and termination of the operation is the only safe course of action.

Note 1 A flight may be ended by means of controlled flight into terrain, if this is possible without creating a hazard to other aircraft, people or property, and all other options are exhausted.

Note 2 An EVLOS operation extends the distance of operation of an RPA. By virtue of the definition, the remote pilot may be the initial EVLOS class 2 observer provided that the remote pilot is not simultaneously using an FPV system.

EVLOS operation means:

(a) an EVLOS operation class 1; or

(b) an EVLOS operation class 2.

first person view system is a system that:

(a) uses a camera on an RPA to produce a video display of the flight as it would be seen if a pilot were notionally on board the RPA in order to assist the remote pilot to navigate, orient, and avoid obstacles to the RPA; and

(b) is sufficiently powerful, sensitive and robust to remain effective for the duration of the EVLOS operation; and

(c) is approved by CASA for the EVLOS operation.

Note Use of an FPV may assist a remote pilot but its use cannot transform the remote pilot into an observer for an EVLOS operation. A remote pilot cannot simultaneously use an FPV and be an observer.

FPV system means first person view system.

observer means:

(a) a trained visual observer class 1; or

(b) a trained visual observer class 2.

trained visual observer class 1 means a person who has been:

(a) trained by a certified RPA operator, in accordance with the requirements in its documented practices and procedures, to observe and communicate about an RPA in an EVLOS operation class 1; and

(b) certified by the RPA operator to have successfully completed the training in accordance with the documented practices and procedures.

trained visual observer class 2 means a person who has been:

(a) trained by a certified RPA operator, in accordance with the requirements in its documented practices and procedures, to observe, and communicate about, an RPA in an EVLOS operation class 1 or class 2; and

(b) certified by the RPA operator to have successfully completed the training in accordance with the documented practices and procedures.

VLOS means visual line of sight.

5.05 Documented practices and procedures for EVLOS operations

For an EVLOS operation approval, a certified RPA operator must have documented practices and procedures containing the following:

(a) for each matter, activity or requirement mentioned in this Chapter — procedures and requirements that comply with this Chapter;

(b) the operator's statement to its remote pilots and observers that the procedures and requirements for relevant operations must be complied with.

Note See also the definition of ***documented practices and procedures*** in subsection 1.04 (2) which requires documented practices and procedures to be approved by CASA.

5.06 Remote pilots for EVLOS operations

Before conducting an EVLOS operation, the remote pilot:

(a) must have completed, in addition to the 5 hours' experience required under paragraph 101.295 (2) (c) of CASR, at least the number of hours of flight time, as relevantly specified in the operator's documented practices and procedures, operating in VLOS operations an RPA of the same type as the RPA that is to be used in the EVLOS operation; and

(b) must have been trained and certified by the RPA operator, in accordance with its documented practices and procedures, as competent to carry out the particular EVLOS operation; and

(c) must have successfully completed a proficiency check that was:

(i) conducted by:

(A) the chief remote pilot of the certified RPA operator; or

(B) a RePL holder of the certified RPA operator who is:

(I) is authorised under the operator's ReOC to conduct the relevant proficiency check; and

(II) approved in writing for the purpose by the operator's chief remote pilot; or

(C) CASA; and

(ii) undertaken not more than:

(A) 12 months before the EVLOS operation; or

(B) 24 months before the EVLOS operation, provided the remote pilot has completed at least 3 EVLOS flights in each of the 12-month periods before the EVLOS operation; and

(iii) carried out in accordance with the relevant certified RPA operator's documented practices and procedures for proficiency checks under this section.

Note Under subregulation 101.300 (4), a RePL is subject to the condition that an RPA must be operated within VLOS unless the licence holder has met certain requirements set out in that subregulation.

5.07 Observers for EVLOS operations

(1) An EVLOS operation class 1 may only be conducted using a trained visual observer class 1 or class 2, certified by the RPA operator as competent to carry out the particular EVLOS operation in accordance with the documented practices and procedures.

(2) An EVLOS operation class 2 may only be conducted using a trained visual observer class 2, certified by the RPA operator as competent to carry out the particular EVLOS operation in accordance with the documented practices and procedures.

(3) An observer for subsection (1) or (2) must have no duties during the operation of an RPA, other than those mentioned in paragraph (e) of the definition of ***EVLOS operation class 1*** or ***EVLOS operation class 2***, as the case requires.

(4) An observer for subsection (1) or (2) must not be required to observe more than 1 RPA for more than 1 remote pilot in any EVLOS operation unless the operation is:

(a) approved in writing by CASA; and

(b) operated in accordance with any conditions of the approval.

(5) An observer for subsection (1) or (2) may use a device, for example, binoculars or a telescope, to assist in carrying out their duties, but must not use the device as the primary means of keeping the surrounding airspace and ground in sight.

(6) For subsection (4), the duties mentioned in paragraph (e) of the definition of ***EVLOS operation class 1*** or ***EVLOS operation class 2*** are to be read as also referring to more than 1 RPA or more than 1 remote pilot, as the case requires.

5.08 Handover procedures between 1 remote pilot and another remote pilot for EVLOS operations

(1) Control of an RPA must not be transferred (***handed over***) from the remote pilot (the ***handing-over remote pilot***) to another person (the ***new remote pilot***) unless:

(a) the other person is also a remote pilot who complies with section 5.06; and

(b) the handover is in accordance with the certified RPA operator's documented practices and procedures.

(2) After a handover occurs, the new remote pilot is:

(a) the remote pilot of the RPA; and

(b) responsible and accountable for ensuring that the EVLOS operation complies with all requirements of the relevant civil aviation legislation as if the operation were first commencing from the time, date and location at which the new remote pilot assumes control of the RPA.

5.09 Pre-flight briefing for an EVLOS operation

The certified RPA operator must ensure that each remote pilot and each observer who is to be involved in an EVLOS operation is briefed, before the operation commences, on the emergency and collision avoidance procedures relevant to the operation.

5.10 Communications in an EVLOS operation class 2

For an EVLOS operation class 2, the communication system (the ***primary communication system***) used by the remote pilot and each observer must be

supported by an alternative or backup communication system (the ***secondary communication system***) that can be immediately activated if the primary communication system fails.

5.11 Control and communication links must be maintained in an EVLOS operation

(1) In an EVLOS operation, an RPA may only be flown:

(a) while the control link performance from the remote pilot station to the RPA is reliably and consistently maintained; and

(b) while the communication link between the remote pilot and a relevant observer is maintained; and

(c) at a distance from the relevant observer that is the lesser of the following:

(i) 1 500 m;

(ii) the distance at which the relevant observer is able to perform all of their duties.

Note 1 The duties of a relevant observer are set out in paragraph (e) of the definition of ***EVLOS operation class 1***, or paragraph (e) of the definition of ***EVLOS operation class 2***, as applicable.

Note 2 For a CASA approval under subsection 5.03 (3), the operator's practices and procedures would be assessed to determine how aviation safety margins were to be maintained and monitored; and whether reliable procedures were in place capable of identifying and addressing any degradation in control or communication links.

(2) An RPA operator who, immediately before the commencement of this section held an approval under section 5.03 for an EVLOS operation, may continue to operate the relevant RPA under the approval as if it continued in force for the duration of the approval (unless it is otherwise revoked by CASA).

5.12 Weather and visibility conditions for an EVLOS operation

(1) An RPA may only be flown in an EVLOS operation:

(a) if the remote pilot, and any observer, each has visual acuity (including when corrected) that complies with the Austroads standard for private motor vehicle licensing visual acuity, as in force from time to time; and

Note The Austroads standard can be found here: https://austroads.com.au/__data/assets/pdf_file/0022/104197/AP-G56-17_Assessing_fitness_to_drive_2016_amended_Aug2017.pdf.

(b) in conditions with a visibility minimum of 5 000 m.

(2) If, during an operation, visibility falls below 5 000 m, the EVLOS operation must be terminated and the RPA landed, as soon as safely possible.

5.13 Controlled airspace and EVLOS operations

An approval of an EVLOS operation conducted in controlled airspace applies only if the operation is conducted in accordance with:

(a) the requirements of Part 101 of CASR and of this MOS; and

Note See, for example, Chapter 4 of this MOS and regulations 101.070, 101.072 and 101.075 of CASR.

(b) any other conditions in any approval from CASA, and any permission from the air traffic control service for the aerodrome, for operations in the relevant controlled airspace.

5.14 Night EVLOS operations

For an approval of an EVLOS operation to be conducted at night, the certified RPA operator must:

(a) be approved for night RPA operations under instrument CASA 01/17, or any replacement instrument in force from time to time unless the replacement instrument expressly applies otherwise; and

(b) satisfy CASA that they can and will comply with the conditions of the instrument.

Note Chapter 6 of this MOS is reserved for more general requirements relating to night operations.

5.15 If manned aircraft are active in the airspace

(1) If, during an EVLOS operation, a manned aircraft is:

(a) flying in the relevant airspace of the operation (the ***relevant airspace***); or

(b) likely to be flying in the relevant airspace;

then, the remote pilot for the EVLOS operation must ensure that the operation does not become a hazard to the manned aircraft, by using, or, subject to subsection (1A), by directing a certified and appropriately trained visual observer to use, the relevant aeronautical VHF channel for:

(c) regular broadcasts; or

(d) direct radiocommunication with the pilot of the manned aircraft.

(1A) Despite a direction given under subsection (1), the remote pilot for the EVLOS operation is at all times responsible for ensuring that the operation of the RPA complies with regulation 101.055 — Hazardous operation prohibited.

(2) Without affecting subsection (1), a person who is a remote pilot for the EVLOS operation must take reasonable steps to make and keep in direct radiocommunication with the pilot of a manned aircraft while the RPA and the manned aircraft are in relevant airspace.

(3) In this section:

relevant airspace means any point of non-controlled airspace into which the manned aircraft is flying at a particular time that is both less than 3 NM in distance and less than 1 500 ft in height from any point of the airspace in which the RPA is flying at the same time.

5.16 Procedures for loss of control of an RPA in an EVLOS operation

(1) For an RPA in an EVLOS operation, the certified RPA operator's documented practices and procedures must have procedures for the remote pilot to resolve a loss of control over the RPA.

(2) For subsection (1), the procedures must be such as to ensure that the remote pilot can:

(a) re-establish control over the RPA; or

(b) end the flight without creating an unreasonable hazard to another aircraft, or to people or property.

Note A flight may be ended by means of controlled flight into terrain, if this is possible without creating a hazard to other aircraft, people or property, and all other options for the continuation of safe, observed, flight are exhausted.

5.17 Procedures for loss of communications in an EVLOS operation class 2

(1) For an RPA in an EVLOS operation class 2, the certified RPA operator's documented practices and procedures must have procedures for the remote pilot to resolve:

(a) any communication system failure relating to the observation of the RPA; or

(b) any breakdown in communication procedures relating to the observation of the RPA; or

(c) any loss of situational awareness by the relevant observer of the RPA for any reason.

(2) For subsection (1), the procedures must be such as to ensure that the remote pilot must:

(a) for a loss of communications with an observer — immediately use the secondary communication system; or

(b) for a loss of situational awareness by the relevant observer — immediately implement the certified RPA operator's procedures for loss of situational awareness by an observer to return the RPA to VLOS or EVLOS; or

(c) end the flight without creating an unreasonable hazard to another aircraft, or to people or property.

Note A flight may be ended by means of controlled flight into terrain, if this is possible without creating a hazard to other aircraft, people or property, and all other options for the continuation of safe flight are exhausted.

5.18 Conflict between the requirements of this Chapter and the documented practices and procedures

(1) A certified RPA operator must ensure that there is no conflict or inconsistency between the requirements of this Chapter and the documented practices and procedures.

(2) If there is any conflict or inconsistency:

(a) the requirements of this Chapter must prevail; and

(b) the documented practices and procedures must be immediately revised and corrected.

Note See also the definition of ***documented practices and procedures*** in subsection 1.04 (2) of this MOS which requires documented practices and procedures to be approved by CASA.