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RPA—Remotely Piloted Aircraft

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Explanation of Changes

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NOTES:

1. Editorial and format changes were made throughout the TC AIM where necessary, and those that were deemed insignificant in nature were not included in the "Explanation of Changes."
2. The blue highlights in the manual represent the changes described in this section.

RPA

(1) RPA 3.2.22.9 – Command and control (C2) link tips for urban environments
New subsection added regarding C2 challenges drone pilots can face during urban operations.

(2) RPA 3.2.22.10 – Urban Airflow
A link to a supporting research document was added to this subsection.

(3) RPA 3.4.1.3 – Established Procedure for Operations at or in the Vicinity of an Airport or Heliport
This subsection was updated for clarity.

(4) RPA 3.4.4.1 – General
Table 3.1 was updated with new information.

Table of Contents

RPA—Remotely Piloted Aircraft 437

1.0 General Information 437

2.0 Micro Remotely Piloted Aircraft (RPA) 438

3.0 Small and Medium Remotely Piloted Aircraft (RPA) 439

3.1 Registration of Remotely Piloted Aircraft (RPA) 439

3.1.1 Modifying a Registration 440
3.1.1.1 Cancelling a Registration 440
3.1.1.2 Change of Name or Address 440
3.1.1.3 Edit RPA Registration 440

3.2 General Operation and Flight Rules 440

3.2.1 Line-of-sight 440
3.2.1.1 Visual line-of-sight (VLOS) 440
3.2.1.2 Radio line-of-sight (RLOS) 441
3.2.2 Emergency Security Perimeters 441
3.2.3 Airspace 441
3.2.3.1 Canadian Domestic Airspace 441
3.2.3.2 Controlled Airspace 441
3.2.3.3 Restricted Airspace 442
3.2.3.4 Drone Site Selection Tool 443
3.2.3.5 Inadvertent Entry Into Controlled or Restricted Airspace 443
3.2.4 Flight Safety 443
3.2.5 Right of Way 444
3.2.6 Detecting and Avoiding Traffic 444
3.2.6.1 General 444
3.2.6.2 Seeing Traffic 444
3.2.6.3 Hearing Traffic 445
3.2.6.4 Avoiding a Collision 445
3.2.7 Fitness of Crew Members 445
3.2.8 Visual Observers 446
3.2.9 Compliance With Instructions 447
3.2.10 Carriage of Persons 447
3.2.11 Procedures 447
3.2.11.1 Normal Operating Procedures 447
3.2.11.2 Emergency Procedures 447
3.2.12 Pre-flight Information 447
3.2.12.1 Pre-flight Inspections 447
3.2.12.2 Fuel and/or Energy 448
3.2.13 Maximum Altitude 448
3.2.13.1 Types of Altitudes 448
3.2.13.2 Measuring Altitude 449
3.2.14 Horizontal Distance 449
3.2.15 Site Survey 450
3.2.15.1 Understanding Your Area of Operation 450
3.2.15.2 Locating Local Aerodromes and Airports 450
3.2.15.3 Identifying Classes of Airspace 450
3.2.16 Other Pre-flight Requirements 450
3.2.17 Serviceability of the RPAS 450
3.2.17.1 Airframe (All Types) 451
3.2.17.2 Landing Gear 451
3.2.17.3 Powerplant 451
3.2.17.4 Propellers 451
3.2.17.5 Battery—Lithium Polymer 451
3.2.17.6 RPAS Control Station/Receiver/Transmitters 451
3.2.18 Availability of RPAS Operating Manuals 451
3.2.19 Manufacturer's Instructions 451

3.2.20 Control of RPAS ... 452
3.2.21 Takeoffs, Launches, Approaches, Landings, and Recovery ... 452
3.2.22 Minimum Weather Conditions ... 452
3.2.22.1 Sources of Weather Information ... 452
3.2.22.2 Micro vs. Macro Climate Environments ... 453
3.2.22.3 Wind ... 453
3.2.22.4 Visibility ... 453
3.2.22.5 Clouds ... 453
3.2.22.6 Precipitation ... 453
3.2.22.7 Fog ... 454
3.2.22.8 Temperature ... 454
3.2.22.9 C2 link tips for urban environments ... 454
3.2.22.10 Urban Airflow ... 455
3.2.22.11 Sun ... 455
3.2.23 Icing ... 455
3.2.24 Formation Flight ... 456
3.2.25 Operation of Moving Vehicles, Vessels, and Traditional Aircraft ... 456
3.2.26 First-person View (FPV) Devices ... 456
3.2.27 Night Flight ... 456
3.2.27.1 Detecting Aircraft During Night Operations ... 456
3.2.27.2 Aircraft Lighting ... 457
3.2.27.3 Use of Lights ... 457
3.2.27.4 Night Vision Goggles ... 457
3.2.28 Multiple Remotely Piloted Aircraft (RPA) ... 457
3.2.29 Special Events ... 457
3.2.29.1 Special Aviation Events ... 457
3.2.29.2 Advertised Events ... 457
3.2.30 Handovers ... 458
3.2.31 Payloads ... 458
3.2.32 Flight Termination Systems ... 458
3.2.33 Emergency Locator Transmitters (ELT) ... 459
3.2.34 Transponders and Automatic Pressure-Altitude Reporting Equipment ... 459
3.2.34.1 Transponder-required Airspace ... 459
3.2.34.2 Transponder Requirements ... 459
3.2.35 Operations at or in the Vicinity of an Aerodrome, Airport or Heliport ... 459
3.2.36 Records ... 460
3.2.37 Incidents and Accidents ... 460
3.2.38 Tethered Remotely Piloted Aircraft (RPA) ... 461
3.2.39 NOTAM ... 461
3.2.39.1 General ... 461
3.2.39.2 RPAS NOTAM ... 461
3.3 Basic Operations ... 462
3.3.1 General ... 462
3.3.2 Pilot Requirements ... 462
3.3.2.1 Remotely Piloted Aircraft (RPA) Pilot Certificate ... 462
3.3.2.2 Recency Requirements ... 462
3.3.2.3 Access to Certificate and Proof of Currency ... 462
3.3.2.4 Examination Rules ... 462
3.3.3 Small Remote Pilot Aircraft (RPA) Requirement ... 462
3.4 ADVANCED AND LEVEL 1 COMPLEX OPERATIONS ... 462
3.4.1 General — Advanced Operations ... 462
3.4.1.1 Application ... 462
3.4.1.2 Advanced Operations at or in the Vicinity of an Airport or Heliport ... 463
3.4.1.3 Established Procedure for Operations at or in the Vicinity of an Airport or Heliport ... 463
3.4.1.4 Declaration — Permitted Advanced Operations ... 464
3.4.1.5 Eligible RPAS for Advanced Operations ... 464
3.4.1.6 Advanced Operations in Controlled Airspace ... 464
3.4.2 General — Level 1 Complex Operations ... 465
3.4.2.1 Application ... 465
3.4.2.2 Eligible RPAS for Level 1 Complex Operations ... 465

3.4.2.3 Level 1 Complex Operations 465
3.4.3 Advanced and Level 1 Complex RPA Pilot Certification Requirements 466
3.4.3.1 Advanced RPA Pilot Certificate 466
3.4.3.2 Level 1 Complex RPA Pilot Certificate 466
3.4.3.3 Recency Requirements 466
3.4.3.4 Access to Certificate and Proof of Currency 467
3.4.3.5 Examination Rules 467
3.4.4 RPAS Safety Assurance Declaration 467
3.4.4.1 General 467
3.4.4.2 Modifications of RPAS with Safety Assurance Declaration 468
3.4.4.3 Small RPA and Medium RPA — Operations in Controlled Airspace 469
3.4.4.4 Small RPA — VLOS Operations Less Than 100 ft But More Than 16.4 ft of Any Person 469
3.4.4.5 Small RPA — VLOS Operations Less Than 16.4 ft of Any Person 469
3.4.4.6 Small RPA — BVLOS Operations More Than 1 km From Populated Areas 469
3.4.4.7 Small RPA — BVLOS Operations Over Sparsely Populated Areas or Near Populated Areas 470
3.4.4.8 Medium RPA — VLOS More than 500 ft From Any Person 470
3.4.4.9 Medium RPA — VLOS Operations Less Than 500 ft But More Than 100 ft of Any Person 470
3.4.4.10 Medium RPA — VLOS Operations Less than 100 ft of Any Person 471
3.4.4.11 Medium RPA — BVLOS Operations More Than 1 km From Populated Areas 471
3.5 Flight Reviewers 471
3.5.1 General 471
3.5.2 Pilot Requirements 471
3.5.2.1 Flight Reviewer Rating 471
3.5.2.2 Examination 472
3.5.3 Conduct of Flight Reviews 472
3.6 Special Flight Operations—Remotely piloted aircraft system 472
3.6.1 General 472
3.6.2 Application for a SFOC-RPAS 473
3.6.3 SFOC—RPAS Service Standard and Charges 473

RPA—Remotely Piloted Aircraft

1.0 General Information

The following parts of this chapter provide detailed information for the safe operation of a remotely piloted aircraft system (RPAS). This information is intended to be used in conjunction with regulations and associated standards found in Part IX of the *Canadian Aviation Regulations* (CARs). Part IX rules apply regardless of the purpose of the RPAS use (e.g., recreational, commercial, work and research).

This chapter has been organized to follow the order in which information is described in Part IX of the CARs, with a description of the regulation, ways to meet the regulation's objective and additional related information. Throughout the *Transport Canada Aeronautical Information Manual* (TC AIM), the term "should" implies that TC encourages all pilots to comply with the applicable procedure. The term "shall" implies that the applicable procedure is mandatory because it is supported by regulations.

While an RPA refers to the aircraft itself, including related components such as batteries, payloads and lights, an RPAS includes the RPA as well as the control station and command and control (C2) link.

A first set of RPAS rules was introduced in June 2019 (<https://gazette.gc.ca/rp-pr/p2/2019/2019-01-09/html/sor-dors11-eng.html>) in CARs Part IX — RPAS (<https://lois-laws.justice.gc.ca/eng/regulations/SOR-96-433/FullText.html#s-900.01>), which addressed safety concerns and created a flexible and predictable environment for small RPA (250 g to 25 kg) flown within visual line-of-sight (VLOS).

To unlock the potential of medium-sized RPA (over 25 kg to 150 kg) and beyond visual line-of-sight (BVLOS) operations in Canada, regulatory changes were needed. The new regulations allow medium RPA operations and some lower-risk BVLOS operations without the need for a Special Flight Operations Certificate (SFOC) for a RPAS. The new rules for medium RPA, sheltered operations, extended visual line of sight (EVLOS) operations and BVLOS operations are in effect since November 4, 2025.

Canada's expanded RPAS regulations introduce:

- new Level 1 Complex RPA pilot certification, new standard 922 RPAS safety assurance declarations (SAD) and for any supporting systems and RPAS operator certification (RPOC) for lower-risk BVLOS operations,
- expanded privileges for advanced RPA pilots to fly sheltered operations in any airspace and extended VLOS (EVLOS) operations in uncontrolled airspace,
- new rules for flying medium RPA (over 25 kg up to 150 kg) within VLOS,
- new technical standard 922 for RPAS flying advanced operations,
- new requirements for flying micro-RPA at advertised events,
- new and updated fees for services provided by Transport Canada (TC).

Disclaimer: If there are any discrepancies between this document and the published regulations, the regulations prevail. You may also refer to the *2025 Summary of changes to Canada's RPAS regulations* at <https://tc.canada.ca/en/aviation/drone-safety/2025-summary-changes-canada-drone-regulations>.

As an RPA is defined as a navigable aircraft under CAR 101.01, other sections of the CARs may also apply, such as CARs 601.04 and 601.15 and section 5.1 of the *Aeronautics Act*. These regulations restrict the use of airspace to all "aircraft." For more information, refer to RACs 2.8.6 and 2.9.2.

Please note that the imperial system of units is used in aviation and for all information contained on aeronautical charts and publications. Other units apply to specific situations and can be found in Table 1.1 of GEN 1.4.1.

Part IX of the CARs is enforced by delegated peace officers such as a member of the Royal Canadian Mounted Police (RCMP) and by TC inspectors and investigators. TC is also partnering with other provincial and municipal law enforcement agencies to obtain delegation to enforce Part IX. Refer to LRA 6.4 for more information on monetary penalties and to CAR 103 Schedule II, where they are designated and listed. Violators failing to comply with CARs requirements may be subject to individual penalties of $5,000 and/or corporate penalties of $25,000.

In addition to Part IX and other regulations in the CARs, other regulations apply when an RPAS is operated. When choosing a site for an RPA's takeoff, launch, landing or recovery, the pilot should ensure that they have the landowner's permission to use the site. The provisions of the *Criminal Code* could apply if an individual is creating mischief, flying an RPA while impaired by fatigue, flying an RPA under the influence of alcohol or drugs, or endangering the safety of people or an aircraft.

Other rules such as the *Privacy Act*, the *Personal Information Protection and Electronic Documents Act* or provincial privacy legislation may also apply. Be respectful of people's privacy. It is a good practice to let people know you will be flying in the area and what you are doing with your RPA; you should also obtain an individual's consent if you are going to record private information. Privacy guidelines can be found online at <https://tc.canada.ca/en/aviation/drone-safety>.

The landing or takeoff of aircraft in national parks and national park reserves may only take place at prescribed locations. Contact information for each location can be found on the Parks Canada Web site at <https://parks.canada.ca/>. Additional details can be found in the *National Parks of Canada Aircraft Access Regulations,* available at <https://laws-lois.justice.gc.ca/eng/regulations/SOR-97-150/page-1.html>.

The *Marine Activities in the Saguenay-St. Lawrence Marine Park Regulations* also applies to RPAS <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2002-76/page-3.html>. As per article 18, "It is prohibited for any pilot to fly an aircraft over the park at an altitude of less than 609.6 m (2,000 feet) from the surface of the water or take off from or land in the park unless the person is the holder of a special activity permit authorizing this activity."

The *Migratory Birds Regulations* may apply to RPAS. The landing or takeoff of aircraft in areas designated as bird sanctuaries may require a permit. Contact information for bird sanctuaries can be found at Environment and Climate Change Canada's Web site at <https://www.canada.ca/en/environment-climate-change/services/migratory-bird-sanctuaries.html>.

Contact information for provincial and territorial game officers and information concerning the preservation of wildlife within the various provinces and territories in Canada can be found in the *AIP Canada* on the NAV CANADA Web site: <https://www.navcanada.ca/en/aeronautical-information/aip-canada.aspx>.

The *Species at Risk Act* and the *Marine Mammal Regulations* apply to RPAS to protect their well-being and yours. Watching whales and other marine mammals in their natural surroundings can disturb and even harm them. Information for marine wildlife watching is available on Fisheries and Oceans Canada's Web site: <https://www.dfo-mpo.gc.ca/species-especes/mammals-mammiferes/watching-observation/index-eng.html>. There are laws for Canadian waters in general: for killer whales in British Columbia and the Pacific Ocean, Narrow Churchill and Seal River areas, St. Lawrence estuary, Saguenay St. Lawrence Marine Park, and the Saguenay River. Getting too close could result in charges under the *Fisheries Act*, with fines up to $100,000. Keeping a minimum distance is the law. Viewing marine mammals with RPAs is discouraged unless appropriate permits are obtained. For more information on licensing and permitting, please visit *Application instructions for the authorization of marine mammal disturbance* at <https://www.dfo-mpo.gc.ca/species-especes/mammals-mammiferes/section38/index-eng.html>.

For more information on RPAS:

(a) Visit CARs Part IX: <https://lois-laws.justice.gc.ca/eng/regulations/SOR-96-433/FullText.html#s-900.01>.

(b) Visit the TC drone safety Web site: <https://tc.canada.ca/en/aviation/drone-safety>.

(c) To report an incident, safety issue or concern where an RPAS was involved, see <https://tc.canada.ca/en/aviation/drone-safety/report-drone-incident>.

(d) For information about an upcoming SFOC—RPAS application, visit: <https://tc.canada.ca/en/aviation/drone-safety/drone-pilot-licensing/get-permission-special-drone-operations>. To obtain additional information or requests specific for a SFOC—RPAS application already made, e-mail <TC.RPASCentre-CentreSATP.TC@tc.gc.ca>.

(e) For questions related to an RPAS safety assurance declaration, visit: <https://tc.canada.ca/en/aviation/drone-safety/help-drone-safety-partners-manufacturers/submit-drone-safety-assurance-declaration-overview>. To obtain additional information, e-mail <TC.RPASDeclaration-DeclarationSATP.TC@tc.gc.ca>.

(f) For RPA pilot study resources, visit <https://tc.canada.ca/en/aviation/drone-safety/drone-pilot-licensing/drone-pilot-study-resources>. Also, visit the *RPAS 101* Manual that provides general knowledge to Canadian RPA pilots: <https://www.aerialevolution.ca/wp-content/uploads/2022/02/Nov-27-RPAS-101_EN-Final.pdf>.

(g) Visit the National Research Council (NRC) Drone Site Selection Tool at <https://cnrc.canada.ca/en/drone-tool/> and NAV Drone viewer at <https://map.navdrone.ca/>.

2.0 Micro Remotely Piloted Aircraft (RPA)

Remotely piloted aircraft (RPAs) with an operational weight of less than 250 g are named micro-RPAs. The weight of the control station is not factored into the operational weight calculation when determining whether an RPA is a micro-RPA (less than 250 g) or a small RPA (250 g to 25 kg). However, the weight of any payload carried by the RPA, such as an optional camera, a lens filter, pegs, propeller guards, stickers, and lights, will be considered part of the total operational weight. A micro-RPA could thus reach 250 g or more and fall into the category of small RPAs from 250 g to 25 kg and have to comply with Subpart 1 of Part IX of the *Canadian Aviation Regulations* (CARs), requiring, among other things, an RPA registration and marking, and an RPA pilot certification.

If a micro-RPA is modified or has accessories added that bring the operational weight up to or over 250 g (such as propeller guards), the small RPA shall be registered and marked under CARs Part IX, and the RPA pilot will have to comply with the general operating and flight rules in Subpart 1 of Part IX. The registration is done in the Drone Management Portal (DMP) by selecting the option "The drone was built using either a kit, off-the-shelf or custom-built parts." Once registered, the small RPA may be used in the conduct of a flight review, taking into account that it will not have a RPAS safety assurance declaration to operate in controlled airspace or close to people. If the small RPA is demodified back to its original sub-250 g version, then the small RPA registration certificate is not valid anymore, and the RPA is again a micro-RPA until it is back to 250 g or over the small RPA operational weight category. There is no need to deregister the RPA from the DMP in this situation.

Pilots of micro-RPAs are not subject to Subpart 1 of Part IX of the CARs, so they are not required to register and mark their RPAs or obtain a certificate to fly them. However, just like other pilots of RPAs of 250 g and above, they must adhere to CARs general rules under section 900.06 — Reckless or Negligent Operation and ensure they do not operate their RPA in such a reckless or negligent manner as to endanger or be likely to endanger aviation safety or the safety of any person. While there

are no prescriptive elements of the regulation that inform the pilot how to accomplish this objective, there is an expectation that the pilot of a micro-RPA should use good judgment, identify potential hazards and take all necessary steps to mitigate any risks associated with the operation. This should include having an understanding of the environment in which the RPA pilot is operating, with particular attention paid to the possibility of aircraft or people being in the same area.

As a rule of thumb to respect section 900.06 — Reckless or Negligent Operation:

(a) maintain the micro-RPA in direct line of sight,

(b) avoid flying your micro-RPA above 400 ft above ground level (AGL),

(c) keep a safe lateral distance between your micro-RPA and other people,

(d) stay far away from aerodromes, water aerodromes and heliports,

(e) avoid flying near critical infrastructure,

(f) stay clear of aircraft at all times,

(g) conduct a pre-flight inspection of your micro-RPA,

(h) keep the micro-RPA close enough to maintain the connection with the control station,

(i) follow the manufacturer's operational guidelines,

(j) stay away from special aviation or advertised events,

(k) stay away from emergency security perimeters.

These guidelines will help you avoid flying in a negligent or reckless manner and being subject to monetary penalties. They will also help ensure that you enjoy a safe flight and minimize the risk of an incident. Remember: if you feel that a flight is risky, do not fly.

Since April 1, 2025, new regulations are applicable to all RPA, including those weighing less than 250 g:

- section 900.07 — Inadvertent Entry Into Restricted Airspace, previously subsection 901.14(2) — Restricted Airspace,
- section 900.08 — Prohibition — Emergency Security Perimeter, previously section 901.12 — Prohibition — Emergency Security Perimeter, and
- new paragraph 903.01(b) requires a SFOC—RPAS for the operation of an RPA having an operating weight of less than 250 g (0.55 lb) at an advertised event. See section 3.6 for information about SFOC—RPAS.

Since CARs subsection 601.04(2) and section 601.15, as well as section 5.1 of the *Aeronautics Act*, prohibit the use of airspace for "all aircraft," they therefore apply to micro-RPAs as they are considered aircraft under the *Aeronautics Act* and the CARs. For more information, see RACs 2.8.6 and 2.9.2.

Micro-RPAs are therefore prohibited from entering the following airspaces without proper authorization:

(a) as per subsection 601.04(2) and section 900.07, Class F special-use restricted airspace (CYR);

(b) as per section 601.15, airspace over a forest fire area or over any area that is located within 5 NM of a forest fire area, or any airspace for which a NOTAM for forest fire aircraft operating restrictions has been issued; and

(c) zones in which section 5.1 of the *Aeronautics Act* restricts the use of airspace for all aircraft.

A pilot that is found to have created a hazard either to aviation safety or to people on the ground is subject to an individual penalty of $1,000 and/or a corporate penalty of $5,000 (CARs 103, Schedule II).

3.0 Small and Medium Remotely Piloted Aircraft (RPA)

3.1 Registration of Remotely Piloted Aircraft (RPA)

All 250 g and above remotely piloted aircraft (RPAs) in Canada must be registered, and the registration number must be on the aircraft and clearly visible (*Canadian Aviation Regulations* [CARs] 900.13 and 900.14). The method of marking the registration on the RPA is left to the discretion of the owner. The registration should be located on the main body of the aircraft and not on frangible or removable parts such as batteries, motor mounts or payloads.

Registration is completed online through the Drone Management Portal (DMP) at <https://tc.canada.ca/en/aviation/drone-safety/drone-management-portal>. A certificate with a registration number is provided immediately once the required information is submitted and the associated fee is paid. To register a 250 g and above RPA, the applicant must meet the requirements of CAR. A certificate with a registration number is provided immediately once the required information is submitted and the associated fee is paid. To register a 250 g and above RPA, the applicant must meet the requirements of CARs 900.15.

A person who is at least 14 years of age is qualified to be the registered owner of an RPA if they are:

(a) a Canadian citizen or a permanent resident of Canada;

(b) a corporation or entity that is incorporated or formed under the laws of Canada or a province; or

(c) a government in Canada or an agent or mandatary of such a government.

As defined by Immigration, Refugees and Citizenship Canada (IRCC), a permanent resident of Canada is someone who has been given permanent resident status by immigrating to Canada but is not a Canadian citizen. A special flight operations certificate (SFOC) for a remotely piloted aircraft system (RPAS) is required for a foreign operator or pilot to be able to comply with the registration and marking requirements. An SFOC is not required for a foreign pilot if they are operating an RPA

registered under subsection 900.13(1) by a qualified owner under section 900.15. For more information, visit our Web site: <https://tc.canada.ca/en/aviation/drone-safety/drone-pilotlicensing/get-permission-special-drone-operations>.

A 250 g or above RPA pilot is required to present proof of registration (digital or physical) upon request from a peace officer, an immigration officer or a person delegated by the Minister of Transport, such as a Transport Canada inspector (CARs 103.02(2) and 900.20). Failure to register, mark or present proof of registration of an RPA can result in individual penalties of up to $5,000 and/or corporate penalties of up to $25,000.

3.1.1 Modifying a Registration

3.1.1.1 Cancelling a Registration

An RPA registration is cancelled once any of the conditions detailed in CARs 900.18 are met. It is the responsibility of the registered owner to notify the Minister within 7 days if their registered RPA is destroyed, permanently out of service, missing for more than 60 days, missing with a terminated aircraft search, or transferred to a new owner. The registration is also cancelled if the owner of the aircraft dies, the entity that owns the aircraft ceases to exist, or the owner no longer meets the requirements of CARs 900.15.

Notification can be provided to the Minister through the DMP.

It is important to note that the registration is cancelled immediately when any of the conditions above are met and not when the Minister is notified.

If an RPA for which the registration has been cancelled and for which the Minister has been notified has been found, fixed or otherwise brought back into service, an application for a new registration must be completed.

Failure to notify the Minister in accordance with CARs 900.18 may result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.1.1.2 Change of Name or Address

Registered owners of 250 g and above RPAs are required to notify the Minister within 7 days of a change of name or address. Notification can be provided to the Minister through the DMP.

Failure to notify the Minister in accordance with CARs 900.19 may result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.1.1.3 Edit RPA Registration

You may update your RPA registration to:

(a) update the nickname/description of the drone;

(b) fix an incorrect serial number entered; or

(c) update the serial number due to a warranty replacement for the **same make/model**.

If the wrong make/model was selected during initial registration, please contact us to make a correction:

<https://tc.canada.ca/en/aviation/drone-safety/drone-management-portal>.

3.2 General Operation and Flight Rules

This subpart describes general rules for small remotely piloted aircraft (RPAs); these rules apply to both basic and advanced operations unless there are specific exclusions.

3.2.1 Line-of-sight

Visual line-of-sight (VLOS) RPAS operations rely on the LOS concept to ensure safety and regulatory compliance. This concept assumes an imaginary line between the pilot, through the control station, and the RPA, unimpeded by any obstacles or excessive distance. Line-of-sight can be broken into two distinct categories:

1. Visual line-of-sight by way of the pilot keeping a visual reference with the RPA unaided throughout the flight.
2. Radio line-of-sight (RLOS), which is a function of the C2 data link between the control station and the RPA for the purposes of managing the flight. Both the VLOS and the RLOS share the same foundational idea but can have different applications in RPA operations.

3.2.1.1 Visual line-of-sight (VLOS)

The CARs define VLOS as "unaided visual contact at all times with the remotely piloted aircraft that is sufficient to be able to maintain operational control of the aircraft, know its location, and be able to scan the airspace in which it is operating to detect and avoid other aircraft or objects." (CAR 900.01). CAR 901.11(1) requires that pilots operating RPASs maintain VLOS at all times during flight. Losing sight of the RPA behind buildings or trees or into clouds or fog is strictly prohibited even for a short period of time.

Maintaining VLOS can be achieved by an individual pilot keeping the RPA within sight for the duration of the flight or by using one or more trained visual observers. The RPA must remain in VLOS with the pilot or at least one visual observer at all times. The pilot may take his or her eyes off the aircraft for brief moments to operate the control station or perform other flight-critical tasks without being considered to have lost VLOS. If a task will require extended loss of visual contact, the pilot should use a visual observer or land the aircraft until the task is complete.

While the maximum range for VLOS is not prescribed by regulation, pilots are required to determine the maximum distance the RPA can travel away from them before it becomes a hazard (CAR 901.28(c)). The factors to consider when determining this range are discussed in paragraph 3.2.6.2(a) Limitations of the Eye in this chapter. However, the manufacturer's instructions or user manual takes precedence in this matter and should be consulted prior to determining the maximum range.

It is important to note that the regulations require VLOS be unaided. Pilots and visual observers may not use binoculars, telescopes, or zoom lenses to maintain VLOS, but unmagnified night-vision devices are permitted for night VLOS operations

provided they are able to detect all light within the visual spectrum (CAR 901.39(2)). Glasses, such as sunglasses or prescription glasses, are not considered to be aids and are permitted.

Maintaining VLOS is a fundamental requirement for safe RPA operations as it is the primary, and often only, means of avoiding other airborne traffic. Failure to maintain VLOS can result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.2.1.2 Radio line-of-sight (RLOS)

The signal used by most small RPAs is often transmitted in the 2.4 GHz part of the electromagnetic spectrum, mainly because of range performance and the fact that it is a part of the spectrum that does not require a licence to transmit. This frequency band is crowded by many users, and an RPA pilot can experience electromagnetic interference from these other devices. In addition, signals in this band are susceptible to interruption by physical interference from buildings and trees. It is critical, therefore, to ensure that there is uninterrupted RLOS between the control station and the RPA, regardless of the distance between the two. A control station that is powerful enough to transmit a signal a few kilometres away may nevertheless be unable to control an RPA a few metres away if there is an obstacle or interference in RLOS.

3.2.2 Emergency Security Perimeters

In cases where a public authority has established a security perimeter around an emergency area (e.g. fire, police incident, earthquake, or flood) RPA pilots are required to stay outside of the perimeter unless they are acting in the service of the public authority that created the perimeter, acting to save a human life, or working with first responders such as police or fire authorities (CAR 901.12).

Security perimeters can generally be identified as places where public officials limit or restrict access, where caution or police perimeter tape has been erected, or where first responders are on the scene. It is critical that RPA pilots and their aircraft do not enter or fly over these areas as they may conflict with or prevent lifesaving activities.

Failure to respect these perimeters can result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.2.3 Airspace

3.2.3.1 Canadian Domestic Airspace

Canadian Domestic Airspace (CDA) includes all airspace over the Canadian land mass, the Canadian Arctic, the Canadian Arctic Archipelago and those areas of the high seas within the airspace boundaries. CDA is divided into seven classes, each identified by a single letter—A, B, C, D, E, F or G.

CAR Part IX RPAS operating requirements refers to controlled or restricted airspace. The horizontal and vertical limits of airspace are described in the *Designated Airspace Handbook* (DAH).

RPA pilots are required to keep their RPA within CDA (CAR 901.13).

Failure to remain within CDA can result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.2.3.2 Controlled Airspace

RPA pilots are required to keep their RPA clear of controlled airspace unless:

(a) the pilot holds a pilot certificate—RPA (VLOS)—advanced operations as described in section 3.4.3.1 of this chapter;

(b) the RPAS manufacturer has declared that the unit meets the appropriate safety assurance profile as described in section 3.4.4 of this chapter; and

(c) the RPA pilot has received an authorization from the appropriate air navigation service provider (ANSP) as described in section 3.4.1.6 of this chapter.

All three conditions must be met to gain access to controlled airspace and each will be discussed in an individual section of this chapter.

For the purposes of RPAS operations, controlled airspace includes Class A, B, C, D, and E. Class F airspace can be controlled airspace, uncontrolled airspace, or a combination of both.

A basic description of controlled airspace can be found below. Additional information can be found in the *Designated Airspace Handbook* (DAH) (TP 1820) and in subpart RAC 2.8 of the TC AIM. Flight within each class is governed by specific rules applicable to that class and are contained in CAR 601.01, *Division I — Airspace Structure, Classification and Use*. CAR 601 can be found at <https://lois-laws.justice.gc.ca/eng/regulations/SOR-96-433/FullText.html#s-601.01>.

Class A Airspace

RPA pilots wishing to operate in Class A airspace require specific authorization from both TC and NAV CANADA. See section 3.6.1 of this chapter for information about SFOC—RPAS.

Class A airspace is generally defined as high-level airspace starting at FL 180 or approximately 18 000 ft in Southern Domestic Airspace, FL 230 in Northern Domestic Airspace, and FL 270 in Arctic Domestic Airspace. This type of airspace is not denoted on aeronautical charts. Given the high-level nature of Class A airspace, it is rarely a concern for small RPA pilots. More information on Class A airspace can be found in the TC AIM RAC 2.8.1.

Class B Airspace

RPA pilots wishing to operate in Class B airspace require specific authorization from both Transport Canada and the ANSP. See section 3.6.1 of this chapter for information about SFOC—RPAS.

Class B airspace is generally defined as low-level controlled airspace and exists between 12 500 ft and the floor of Class A airspace but it may include some control zones and control areas that are lower. The specific dimensions of Class B airspace in Canada can be found in the DAH.

Class C Airspace

Class C airspace is considered an advanced operating environment. See section 3.4.1.6 of this chapter for more information.

Class C airspace is controlled airspace, generally exists around large airports and extends from the surface to an altitude of 3 000 ft AGL, but the exact size and shape of the space is dependent on local airspace management needs.

As per CAR 601.08(3), Class C airspace becomes Class E controlled airspace when the appropriate air traffic control unit is not in operation.

Class C airspace is depicted on all VFR Navigation Charts (VNC) and VFR Terminal Area Charts (VTA) as well as in the DAH using NAV CANADA's drone flight planning tool and the National Research Council Canada (NRC) drone site selection tool.

Class D Airspace

Class D airspace is considered an advanced operating environment. See section 3.4.1.6 of this chapter for more information.

Class D airspace is controlled airspace and generally exists around medium-sized airports and extends from the surface to an altitude of 3 000 ft AGL, but the exact size and shape of the space is dependent on local airspace management needs.

As per CAR 601.09(3), Class D airspace becomes Class E controlled airspace when the appropriate air traffic control unit is not in operation.

Class D airspace is depicted on all VNCs and VTAs as well as in the DAH using NAV CANADA's drone flight planning tool and the NRC drone site selection tool.

Class E Airspace

Class E airspace is considered an advanced environment. See section 3.4.1.6 of this chapter for more information.

Class E airspace is controlled airspace for aircraft operating under IFR and can exist around an airport as a control zone or away from an airport where an operational need exists to control IFR aircraft. Class E control zones usually extend from the surface to an altitude of 3 000 ft AGL. It can also often exist from 2 200 ft AGL and up in a control area extension surrounding a control zone. When this type of airspace is not associated with an airport, it usually begins at 700 ft AGL and extends to 12 500 ft ASL, but the exact size and shape of the space is dependent on local airspace management needs.

A Class C or D airspace becomes Class E controlled airspace when the appropriate air traffic control unit is not in operation.

Class E airspace is depicted on all VNCs and VTAs as well as in the DAH using NAV CANADA's drone flight planning tool and the NRC drone site selection tool.

Class F Airspace

Class F airspace is special-use airspace and can be either restricted or advisory. Class F can be controlled airspace, uncontrolled airspace or a combination of both depending on the classification of the airspace surrounding it. Class F airspace is identified on all VNCs and VTAs as well as in the DAH using the NAV Drone Viewer and the NRC drone site selection tool. The DAH is updated every 56 days and is available on the NAV CANADA Web site at <www.navcanada.ca/en/aeronautical-information/operational-guides.aspx/>.

Class F Restricted Airspace

Class F restricted airspace is denoted as CYR followed by three numbers (e.g., CYR123) and should be avoided by all aircraft, including all RPAs, except by those approved by the user agency identified in the DAH. The letter D for danger area will be used if the restricted area is established over international waters. CYRs can be found over prisons and some military training areas, for example. Additional information about restricted airspace can be found in RAC 2.8.6 and 2.9.2. To gain access to Class F restricted airspace, RPA pilots should contact the user agency as listed for the specific block of airspace in the DAH.

Class F Advisory Airspace

Class F advisory airspace is denoted as CYA followed by three numbers (e.g., CYA123). CYA denotes airspace reserved for a specific application, such as hang gliding, flight training or helicopter operations. RPA pilots are not restricted from operating in advisory airspace, and no special permission is required, but pilots should be aware of the reason the airspace has the advisory and should take steps to identify any additional risks and mitigate them. Many activities in a CYA often bring traditional aircraft into airspace below 400 ft AGL and are therefore a greater risk to RPA operations. Additional information can be found in RAC 2.8.6.

Class G Airspace

Class G airspace exists in any space that is not Class A, B, C, D, E, or F. Class G airspace is uncontrolled and is considered the basic operating environment for RPAS, assuming the conditions regarding proximity to people, airports, and heliport are met. These will be discussed in RAC 3.2.14 and 3.2.35.

3.2.3.3 Restricted Airspace

No person may conduct aerial activities within active restricted airspace unless permission has been obtained from the user agency and the controlling agency.

The user agency is the civil or military agency or organization responsible for the activity for which the airspace has been provided. It has the jurisdiction to authorize access to the airspace when it is classified restricted. The user agency must be identified for Class F restricted airspace and, where possible, it should be identified for Class F advisory airspace.

There are two additional methods of restricting airspace:

(a) CAR 601.15 is designed to allow temporary flight restrictions to aircraft for forest fires. No person shall operate an aircraft

in the airspace below 3 000 ft AGL within 5 NM (9.3 km) of the limits of a forest fire area, or as described in a NOTAM (CARs 601.15, 601.16 and 601.17). In the interest of safe and efficient fire fighting operations, the Minister may issue a NOTAM restricting flights over a forest fire area to those operating at the request of the appropriate fire control authority (i.e., water bombers) or to those with written permission from the Minister. The NOTAM would identify the following:

(i) the location and dimensions of the forest fire area;
(ii) any airspace in which forest fire control operations are being conducted; and
(iii) the length of time during which flights are restricted in the airspace.

(b) Section 5.1 of the *Aeronautics Act* allows the Minister to restrict flight in any airspace, for any purpose, by NOTAM. This authority is delegated by the Minister to cover specific situations for a temporary period, such as oil well fires, disaster areas, etc. for the purpose of ensuring safety of flight for air operations in support of the occurrence.

RPA restricted airspace will be created in specific locations where the restriction is necessary for aviation safety or security or for the protection of the public. These restrictions will be published in a new section of the DAH under the authority of the Minister of Transport. If an RPA restricted airspace initiated by NOTAM remains valid for more than 90 days, it will be transferred to the DAH. Concurrent with publishing in the DAH, the NAV CANADA NAV drone application will depict the RPA restricted airspace on the associated digital map and will not be indicated in aeronautical publications that are used primarily for traditional aviation. Permanent exemptions will be in place for all police, fire fighting and first responders RPA operations.

NOTE:
As an RPA is defined as a navigable aircraft under section 101.01 of the CARs, sections 601.04 and 601.15 of the CARs as well as section 5.1 of the *Aeronautics Act* restrict the use of restricted airspace to all "aircraft." This includes any RPA and micro-RPA. For more information, refer to TC AIM - RAC 2.8.6 and 2.9.2.

3.2.3.4 Drone Site Selection Tool

This online interactive tool provides information regarding airspace restrictions around airports, heliports and aerodromes to facilitate flight planning and ensure compliance with the regulations. It was designed to help RPA pilots determine areas where drone flight is prohibited, restricted or potentially hazardous. The drone site selection tool can be found at <https://cnrc.canada.ca/en/drone-tool/>.

The tool is powered by a Google Earth engine that uses colour to identify areas that require additional caution or where RPA flights are prohibited according to a basic or advanced RPA operation category. Users should start by selecting the appropriate category of drone operations (i.e., basic or advanced). Areas filled with red are prohibited. Areas filled with yellow require additional caution due to other air traffic. Areas filled with orange require permission from NAV CANADA, Parks Canada, National Defence or an airport operator.

When a user clicks on the control zones, information is displayed regarding the emergency contact information, airspace class, flight permission requirements and more. It is important that the user verifies the information before initiating the RPAS operation; it is the pilot's responsibility to contact the responsible authorities if they wish to enter restricted airspace.

Data regarding airports and heliports comes from the *Canada Flight Supplement* (CFS), a NAV CANADA publication, and is updated every 56 days. The airspace data comes from the NAV CANADA DAH. The national park data was extracted from the Canada Lands Surveys Web services. A limited amount of data has been manually added to extend and improve upon the tool.

3.2.3.5 Inadvertent Entry Into Controlled or Restricted Airspace

RPA pilots must be aware of not only the airspace in which they are operating their RPA but also the surrounding airspace, specifically their proximity to controlled airspace and restricted airspace, both laterally and vertically. If the RPAS operation is taking place at a location from which the RPA might enter controlled, restricted or advisory airspace in the event of a fly-away, the RPA pilot should have the contact information for the appropriate user agency or ANSP immediately available.

In the event that the RPA enters or is about to enter controlled or restricted airspace, the pilot must immediately notify the appropriate air traffic control (ATC) unit, flight service station (FSS) or user agency (CARs 900.07 and 901.15).

Failure to notify the appropriate user agency when unauthorized entry into controlled or restricted airspace may occur could result in individual penalties of $3,000 or corporate penalties of $15,000.

3.2.4 Flight Safety

RPA pilots are legitimate airspace users but are new entrants into a complex environment. It is the responsibility of the RPA pilots to take their role in the aviation environment seriously and ensure all necessary steps are taken to mitigate any possible risks. RPA pilots must keep in mind that the risk of injuring a person is greater than colliding with another aircraft, and a good safety margin should be kept according to the situation, especially for advanced operations within 30 m of the public. It is the RPA pilot's responsibility to manage the flight to ensure a safe outcome. He or she is to use all resources available to make appropriate, safe decisions to continue with the RPA flight or to end or re-schedule operations if needed.

If, during an operation, the pilot becomes aware of any situation that endangers aviation safety or the safety of persons on the ground he or she must immediately cease the operation until it is safe to continue (CAR 901.16). Failure to do so may result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.2.5 Right of Way

RPA pilots must give way to all other aircraft, including balloons, gliders, airships, and hang gliders (heavier-than-air aircraft) (CAR 901.17). It is critical that this rule is respected and that RPA pilots take their role in ensuring collision avoidance seriously, as pilots of other aircraft may not be able to see the RPA as well as the RPA pilot can see and hear other aircraft. RPA pilots must not operate so close to another aircraft as to create the risk of collision (CAR 901.18). If the RPA pilot sees a traditional aircraft approaching the area of RPAS operation, they shall take immediate action to avoid any risk of conflict. If a conflict with another aircraft becomes likely, RPA pilots must take immediate action to exit the area by the quickest means possible. This often means rapidly reducing altitude.

Failure to give way to other aircraft or to remain far enough away from other aircraft to avoid a conflict or the risk of collision may result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000 and could constitute endangering an aircraft under the *Criminal Code*.

3.2.6 Detecting and Avoiding Traffic

3.2.6.1 General

When flying an RPA within VLOS, pilots practise "detect-and-avoid" (DAA) as a primary method of minimizing the risk of collision with other aircraft. DAA requires the pilot to look away from the control station and become aware of his/her aircraft and the surrounding environment. If the pilot can acquire skills to compensate for the limitations of the human eye, the DAA practice can be greatly improved and effective in facilitating a safer flight environment altogether. More information on how pilots can improve their visual skills is available in 3.2.6.2(b) Visual Scanning Technique.

In addition, the RPA pilot has other tools to detect traffic, such as hearing an approaching aircraft, monitoring a local ATC frequency, and using transponder or ADS-B monitoring devices, which are becoming more common.

3.2.6.2 Seeing Traffic

Limitations of the Eye

The eye is the primary means of identifying what is happening around us, as 80% of our information intake is conducted through the eyes. During flight we depend on our eyes to provide basic input necessary for flying, such as proximity to other air traffic, direction, speed, and altitude of the RPA. A basic understanding of the eyes' limitations in target detection is important for avoiding collisions.

Vision is influenced by atmospheric conditions, glare, lighting, temperature, aircraft design, and so forth. On a sunny day, for example, glare is worse. Glare makes it hard to see what is at a distance as well as making the scanning process uncomfortable.

Vision can be affected by different levels of illumination:

(a) Bright illumination: reflected off of clouds, water, snow, and desert terrain; produces glare resulting in eye strain.

(b) Dark Adaptation: Eyes must have at least 20 to 30 minutes to adjust to reduced light conditions.

- (i) Red light helps night vision; however, it distorts colour and makes details hard to perceive;
- (ii) Light adaptation can be destroyed in seconds, though closing one eye may preserve some.

Additionally, vision is impaired by exposure to altitudes above 5 000 ft ASL, carbon monoxide inhaled from smoking and exhaust fumes, a deficiency of Vitamin A in one's diet, and prolonged exposure to bright sunlight.

One significant limitation of the eye is the time required for accommodation, or refocusing of objects both near and far. It takes 1 to 2 seconds for the eyes to adjust during refocusing. Considering that you may need up 10 seconds to spot aircraft traffic, identify it, and take action to avoid a mid-air collision, each second is critical. Looking at an empty area of the sky causes empty field myopia and will impair your ability to focus. You should look at a cloud patch or tree line to allow your eyes to focus.

Another eye limitation is the narrow field of vision. While the eyes can observe an approximate 200-degree arc of the horizon at one glance, only a very small centre area called the fovea, in the rear of the eye, has the ability to send clear, sharply focused messages to the brain. All other visual information that is not processed directly through the fovea will be less detailed. More information is available in subpart AIR 3.5 Vision.

Visual Scanning Technique

Avoiding collisions requires effective scanning from before takeoff until the aircraft comes to a stop at the end of a flight. The best way to avoid collisions is by learning how to use your eyes for efficient scanning, as well as understanding the visual limitations described above and not overestimating your visual abilities.

Before takeoff, visually scan the airspace around your intended take-off location. Assess traffic audibly as well, listening for engine sounds and, if possible, radio transmissions. After takeoff, keep scanning throughout the flight to ensure that no other traffic will be a hazard to your aircraft.

Scanning your eyes over a large area of sky at once without stopping to focus on anything is ineffective. Because the eyes can focus only on a narrow viewing area, effective scanning is achieved through short, regularly spaced eye movements that bring successive areas of the sky into the central visual field. Movement can be detected more effectively through peripheral vision, so this pause in a visual scan allows for easier detection of threats such as aircraft and birds. An effective scan is a continuous process used by the pilot and observer to cover all areas of the sky visible from the control station.

Although horizontal back-and-forth eye movements seem to be preferred by most pilots, every pilot should develop a scanning pattern that is most comfortable for them and then adhere to it to assure optimum scanning. Pilots should realize that their

eyes may require several seconds to refocus when switching views between items in or on the control station and distant objects. The eyes will also tire more quickly when forced to adjust to distances immediately after close-up focus, as required for scanning the control station. While there is no "one size fits all" technique for an optimum scan, many pilots use some form of the "block" system scan. This scan involves dividing the sky into blocks, each spanning approximately 10 to 15 degrees of the horizon and 10 to 15 degrees above it. Imagine a point in space at the centre of each block. Focus on each point to allow the eye to detect a conflict within the foveal field, as well as objects in the peripheral area around the centre of each scanning block.

Good scanning requires constant attention-sharing with other piloting tasks, and pilots should remember that good scanning is easily degraded by conditions such as boredom, illness, fatigue, preoccupation with other tasks or ideas, and anxiety.

3.2.6.3 Hearing Traffic

One advantage an RPA pilot has over a pilot of a traditional aircraft is the ability to hear approaching traffic. The first indication an RPA pilot will have of approaching traffic will often be the noise from the engines and/or rotors, both of which can be useful cues to direct the pilot's attention to traffic detection. Even though these noise cues can be distorted by terrain, buildings, or wind, they are still a credible means for the RPA pilot to focus on identifying approaching aircraft until they can be visually acquired.

Monitoring Air Traffic Frequencies

It is possible that an RPA pilot will have access to a radio for monitoring ATC frequencies. This radio may be part of a pilot's risk-mitigation efforts in the event of a non-standard operation. In any event, this radio can be an extremely valuable source of traffic information, provided the RPA pilot is aware of the correct frequency to monitor. Aviation frequencies can be found on aviation maps as well as in the CFS.

Table 3.1—Air Traffic Frequencies

Frequency (MHz)	Usage
126.7	Uncontrolled airspace
123.2	Uncontrolled, unassigned aerodromes

While monitoring the radio, a pilot can build up a mental picture of the other traffic in the local area and, depending on the level of the pilot's knowledge of aviation, he or she can use the radio calls from other aircraft to determine potential hazards to the RPA operation.

In accordance with section 33 of the *Radiocommunication Regulations*, a person may operate radio apparatus in the aeronautical service [...] only where the person holds [a Restricted Operator Certificate with Aeronautical Qualification (ROC-A), issued by Innovation, Science and Economic Development Canada]. Also, all radio equipment used in aeronautical services must be licensed by Industry Canada.

For more information on the standard radio phraseology used in aviation, see Innovation, Science and Economic Development's study guide RIC-21 for the ROC-A, COM 1.0 in the TC AIM, or NAV CANADA's *VFR Phraseology Guide*.

3.2.6.4 Avoiding a Collision

Once an aircraft is detected and it is determined to be a conflict, the RPA pilot is responsible for avoiding a mid-air collision. The best way to fulfill this obligation will vary depending on the scenario, and RPA pilots should plan how they are going to react to a potential collision prior to taking off or launching to ensure their strategy best fits the operation. The fastest method of resolving a potential conflict is likely reducing altitude.

The RPA pilot must always give way to other airspace users (CAR 901.17), and RPA pilots should recognize that the pilot of the other aircraft likely will not see the RPA with sufficient time to react. The responsibility of avoiding a collision lies with the RPA pilot, and it is a responsibility that should be taken very seriously as the lives of the people in the other aircraft may depend on it.

3.2.7 Fitness of Crew Members

All members of the crew including the visual observers, pilots, and others involved in the operation of the RPAS must not be under the influence of any drugs or alcohol or fatigued when conducting an operation with an RPAS (CAR 901.19). Additional information can be found in the TC AIM *AIR – Airmanship*, Part 3.0 *Medical Information*.

It is strictly prohibited under CAR 901.19 to act as a pilot or crew member of an RPAS within 12 hours after consuming an alcoholic beverage, while under the influence of alcohol, or while using any drug that impairs a person's faculties. It is also strictly prohibited under PART VIII.1 section 320.14(1) of the *Criminal Code* for a person to act as a pilot or crew member of an RPA while the person's ability to operate is impaired, to any degree, by alcohol, drugs, or a combination of both. All aircraft pilots and crew members must remain fit to fly.

If an RPA pilot takes prescription drugs, it is his or her duty to ensure they do not alter his or her ability to safely engage in RPA operations. It is each individual's responsibility to consult with a physician in a case of doubt and to advise other members of the team of the situation if deemed necessary.

Cannabis became legal, for both recreational and medical purposes, in Canada in October 2018 by virtue of the *Cannabis Act*. Whether it is used recreationally or medically, cannabis has the potential to cause impairment and adversely affect aviation safety. All aircraft pilots and flight crew members (including RPA pilots and visual observers) must abstain from cannabis use for at least 28 days when conducting operations with an RPAS.

Fatigue is as dangerous as drugs or alcohol when it comes to impairment and is oftentimes harder to detect. Fatigue will influence judgment, motor response, and mental capability. Its effects can be present without the person realizing it, making it particularly dangerous. It is important to consider that sleep itself is not the only factor influencing the degree of a person's fatigue. Lack of sleep, work-related stress, family issues, emotional state, and general health are all factors that contribute to the fatigue level of a particular individual. A comprehensive guide to manage fatigue, the Fatigue Risk Management System (FRMS) Toolbox for Canadian Aviation, is available on Transport Canada's Web site: <www.tc.gc.ca/en/services/aviation/commercial-air-services/fatigue-risk-management/frms-toolbox.htm>. It is a great tool to help understand, manage, and mitigate the risks associated with fatigue in an aeronautical context.

It is not just fatigue, alcohol, or drugs that can leave a crew member unfit for duties. Illness and many other conditions may diminish crew members' ability to perform their functions and might render them unfit for the operation. It is the responsibility of individual crew members to conduct a self-assessment to ensure they are fit before accepting any duties related to the operation.

Reviewing a checklist prior to flight can help a crew member determine if they are fit to fly. A simple IM SAFE checklist can be found below but several other examples can be found online. If the answer to any of the questions below is "Yes", you are likely not fit to act as a crew member. The pilot in command of the RPAS operation must be informed as soon as possible of any incapacitation of any of his crew members in order to take the necessary measures.

Table 3.2—IM SAFE Checklist

I	**Illness** Are you suffering from any illnesses that could impair your ability to complete your duties?
M	**Medication** Are you under the influence of any drugs (over-the-counter, prescription, or recreational) that will impair your ability to complete your duties?
S	**Stress** Are personal or professional matters causing stress to the point that you are distracted or otherwise impaired?
A	**Alcohol** Have you consumed any alcohol within the previous 12 hours?
F	**Fatigue** Are you feeling tired? (You should have had sufficient rest in the previous 24 hours and should feel alert.)
E	**Eating and drinking** Are you feeling hungry or thirsty? (You should be adequately nourished and hydrated.)

Failure to abstain from acting as a crew member of an RPAS while unfit may result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000. Acting as a crew member within 12 hours of consuming alcohol or while under the influence of drugs or alcohol may result in individual fines of $5,000 and/or corporate penalties of $15,000.

3.2.8 Visual Observers

In some cases, a visual observer is needed to assist the pilot in maintaining a constant VLOS with the RPA to comply with the CARs. In complex operating environments like urban areas, the RPA pilot and the visual observer have to maintain communication for updates to any impending conflict between the RPA and terrain, obstacles, aviation traffic, weather, etc. Visual observers shall be trained to perform any duties as assigned to them by the pilot. This includes visual scanning techniques, aircraft identification, communications, and any other knowledge that may be required to successfully perform their duties. The pilot and visual observer(s) shall remain in constant and immediate communication throughout the RPAS operation, as stated in CAR 901.20.

Before beginning an operation, the crew should agree upon consistent communication language specific to the mission at hand. Important information sought by the pilot could be the RPA's relative distance, altitude, and flight path in relation to traditional aircraft but also other hazards like terrain, weather, and structures. The visual observer must be able to determine the RPA's proximity to all aviation activities and sufficiently inform the pilot of its relative distance, altitude, flight path, and other hazards (e.g. terrain, weather, structures) to prevent it from creating a collision hazard.

The visual observer will also help the RPA pilot to keep the operational environment sterile (that is, free of irrelevant conversation) during the flight and minimize the disturbances to the RPA pilot and crew.

Visual observers are not required to possess an RPA pilot certificate when they are crew members of a small RPA (VLOS) carrying out basic or advanced operations, except for extended VLOS operations that requires basic pilot certification as a minimum.

3.2.9 Compliance With Instructions

In any type of safety-critical operation there is a requirement for one person to have the final word on how and when various tasks will be performed. In aviation this person is called the pilot-in-command or pilot. For RPAS operations all crew members are required to follow the instructions of the pilot.

Failure to follow the instructions of the pilot can result in unsafe situations and may be punishable by individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.2.10 Carriage of Persons

RPA pilots are prohibited from operating an RPA with persons on board (CARs 901.22). Since November 4, 2025, an SFOC—RPAS issued under CARs 901.22 is required for the operation of an RPA for the purpose of carrying persons on board. See section 3.6 for information about SFOC—RPAS.

The operation of an RPA with a person on board may result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.2.11 Procedures

3.2.11.1 Normal Operating Procedures

RPA pilots are required to establish procedures for the pre-flight, take-off, launch, approach, landing, and recovery phases of flight. The procedures established must allow the aircraft to be operated within any limitations prescribed by the manufacturer and should be reviewed by the pilot on a regular basis to ensure they contain the most up-to-date information and be available to the pilot at the crew station during all phases of flight in either a written or digital format. Caution should be exercised if the procedures are on the same mobile device that is being used to pilot the RPAS. This practice is not recommended.

3.2.11.2 Emergency Procedures

RPA pilots are required to establish emergency procedures for control station failures, equipment failures, RPA failures, lost links, flyaways, and flight terminations. The procedures established must allow the aircraft to be operated within any limitations prescribed the by manufacturer and should be reviewed by the pilot on a regular basis to ensure they contain the most up-to-date information and be available to the pilot at the crew station during all phases of flight in either a written or digital format. Caution should be exercised if the procedures are on the same mobile device that is being used to pilot the RPAS. Following all emergencies, the PIC should log the events and follow-up actions in accordance with CAR 901.49.

Control Station Failure

Whether the RPAS is controlled via a laptop, RC, or another device, its crew should have troubleshooting items committed to memory for immediate action. Pilots should know and be prepared for how their aircraft will respond to a crashed app, powered down transmitter, or low battery scenario.

Equipment Failure

While some equipment will not be flight-critical, crews should know which items require aircraft grounding and which are safe to fly without. Establishing a manufacturer-advised minimum equipment list is a good practice.

RPA Failure

Crews should be aware of items that will cause a critical failure of the RPA and what flight condition these failures will create. While fixed wings may glide, most multirotors will descend with varying levels of control. Immediate actions should involve establishing a safe area and preparing for injury or incident response.

Lost Link

Immediate action items should include troubleshooting (which, depending on the system used, may involve reorienting antennas), confirming or exchanging the cable connection, or selecting a flight termination system. The crew should monitor the aircraft and the airspace until connection can be regained or the aircraft lands safely; otherwise, flyaway procedures should be initiated.

Flyaway

A flyaway indicates an unresponsive aircraft and should warrant immediate action by the crew to mitigate associated risks both in airspace and on the ground. After initial troubleshooting, action should be taken to alert the ANSP of a deviation from the planned flight path and any potential conflict that may exist. This is why it is critical that pilots understand the airspace surrounding their operating environment both laterally and vertically.

Flight Termination

Flight termination can take many forms and may be as simple as a normal landing or as complex as a fragmentation system or parachute. Another common flight termination system is return-to-home, or RTH. Crews should know when and how to activate RTH and how to cancel or override, if possible.

3.2.12 Pre-flight Information

3.2.12.1 Pre-flight Inspections

Pre-flight inspections should be conducted before every takeoff the aircraft conducts in order to verify the physical, mechanical, and electronic integrity of the RPAS. The following is a brief example of components to be inspected prior to flight and is not all-encompassing. In all instances, the RPAS manufacturer's instruction manual shall be consulted to determine all the

components that must be inspected or require a function check prior to flight. The initial inspection to confirm the RPAS is in a fit and safe state for flight is the most extensive to be conducted before each new day of operations and should include a thorough inspection of the following components, in compliance with the RPAS manufacturer's operating manual recommendations, including (but not limited to):

(a) Airframe;

(b) Landing gear;

(c) Power plant;

(d) Propellers/rotors;

(e) Battery or fuel;

(f) Control station/receivers/transmitter;

(g) Control station device and cables (tablet, phone, laptop, or other).

The crew also needs to be briefed on the following points before takeoff:

(a) Roles and responsibilities of each individual crew member;

(b) Flight plans and anticipated procedures (e.g. command hand-off);

(c) Emergency and contingency plans;

(d) Location of the safety equipment and who is trained to use it;

(e) Public management plan.

Just after takeoff, a brief test flight should be conducted first within short VLOS range in order to verify commands response, flight behaviours, response to current weather conditions, and crew cohesion beforehand.

A brief inspection should also be conducted after each landing (e.g. battery change) and a full inspection should be conducted after each crash or malfunction, or when changing location.

3.2.12.2 Fuel and/or Energy

Estimation of the fuel/energy consumption for the operations should be considered prior to takeoff and described in the flight planning summary. It is important to take into consideration that the stated endurance of the aircraft with a given amount of fuel/energy is a suggested indication from the manufacturer that might change according to different variables. Those factors might include but are not limited to environmental factors (e.g. wind, outside temperature, and altitude), human factors (e.g. piloting skills and/or behaviour), fuel/energy sources quality (e.g. quality of the fuel or battery), and mechanical factors (e.g. engine malfunction, motor friction). The aircraft might not operate properly or predictably when its fuel/energy levels are low. Unexpected circumstances might arise between the initiation of the return procedure and the landing of the aircraft. Therefore, it is recommended that the pilot consider factors that might influence the aircraft endurance and plan the flight time accordingly.

Finally, it is important to consider that RPASs are multi-component systems and that the factors listed above will influence the endurance of other components such as the remote control, ground station, first-person view (FPV) goggles, etc. These should also be taken into consideration when estimating the endurance of the RPAS. Refer to the manufacturer's instructions provided to verify the aircraft and the components endurance rating. In the absence of specific guidance from the manufacturer, it is recommended that pilots take a cautious approach.

3.2.13 Maximum Altitude

In uncontrolled airspace, RPAs are normally limited by regulation to a maximum altitude of 400 ft AGL or 100 ft above the tallest obstruction within 200 ft laterally (CAR 901.25). However, if a pilot is operating under an SFOC—RPAS, the conditions of the SFOC may state a maximum altitude higher or lower than 400 ft (CAR 901.25(2)). In controlled airspace, the maximum altitude permitted for a specific flight will be determined by the ANSP; in most cases, this will be NAV CANADA. The RPA pilot must keep the RPA in VLOS at all times, regardless of the altitude allowed by the ANSP. The maximum altitude possible in VLOS depends on several factors including the RPA's visibility, colour, size, etc. The vast majority of small RPAs are not visible at more than 400 ft AGL in good weather conditions.

3.2.13.1 Types of Altitudes

In aviation, the altitude at which an aircraft flies is normally measured as above sea level (ASL). RPASs usually display above ground level (AGL) altitude from the launch site location. The difference between AGL and ASL can be a few feet, or as much as several thousands of feet, so it is important to know what type of altitude your RPA control station is displaying. This is important because traditional aviation aircraft are usually flown with reference to ASL, so procedures and communication will be conducted using altitudes in feet ASL that may seem odd to an RPA pilot. Please also note that the unit of measurement used in aviation for altitudes, elevations, and heights is feet. Conversion to feet AGL would be difficult for an RPA pilot using metres AGL as an altitude reference in their RPAS. TC AIM GEN 1.4 provides additional information on units of measurement used in aviation.

For instance, an RPA operation may have a limit of 400 ft AGL, but in a location like Calgary, this altitude equates to approximately 4 000 ft ASL, as the Calgary airport is at 3 600 ft ASL. An RPA pilot monitoring ATC radio frequencies in this situation might get confused when trying to determine the location of aircraft if differing altitude measurements are used. In another scenario, an RPA flying near Tofino, BC would have a much easier time trying to reconcile AGL and ASL as the Tofino airport is only at 80 ft ASL.

Station Height

Station height is the altitude measured at a weather reporting station, often an aerodrome, relative to sea level.

Above Ground Level (AGL)

AGL involves an altitude of zero feet (or metres) measured when the RPA is sitting on the ground and, as the aircraft flies, altitude changes are measured in reference to the ground below the RPA, or the initial ground position. In an RPA, this altitude is often

calculated by a GPS position or a downward-pointing laser rangefinder.

It is important to note that many RPAs reference their altitude AGL from the point of launch. This means that the aircraft's altitude AGL may have to be inferred as the aircraft travels over uneven ground. For operations with large ground level height changes where the aircraft is operated near the operational limit of 400 ft, a buffer may need to be included to prevent exceeding the allowable maximum altitude.

Above Sea Level (ASL)

ASL requires a pressure measurement from a local weather station, which is then input into a pressure altimeter on the aircraft. This will then provide an altitude read-out which is relative to sea level. Traditional aircraft and some larger RPAs will be equipped with pressure altimeters and use ASL altitude measurements.

3.2.13.2 Measuring Altitude

Pressure Altimeters

The pressure altimeter used in aircraft is a relatively accurate instrument for measuring flight level pressure but the altitude information indicated by an altimeter, although technically "correct" as a measure of pressure, may differ greatly from the actual height of the aircraft above mean sea level or above ground. As well, the actual height of the aircraft above ground will vary as the aircraft flies between areas of different pressure.

For more information on pressure altimeters and their uses and errors, see subpart 1.5 Pressure Altimeter in the AIR—*Airmanship* chapter of the TC AIM.

Global Positioning System (GPS) Altimeters

The GPS receiver in an RPA typically needs to clearly see a minimum of four satellites to get an accurate position over the earth. GPS is a helpful aid to aviation, but it is important to recognize that there are errors that may affect the accuracy of the position and altitude calculated and displayed by your RPA. In altitude, errors resulting from poor satellite geometry, reception masking by obstacles, or atmospheric interference can result in errors of up to 75 ft (approx. 23 m).

For more information on GPS and other GNSSs, see subpart 5.1 Global Navigation Satellite System (GNSS) in the COM—*Communication* chapter of the TC AIM.

3.2.14 Horizontal Distance

RPA pilots are required to remain 100 ft or 30 m from people not associated with the operation. The distance from people must be maintained regardless of the altitude at which the RPAS is operating.

It is the RPA pilot's responsibility to plan the route of flight in a manner that ensures the RPA does not fly within 30 m of any person, except for crew members and other people involved in the operation. (CAR 901.26) Examples of people involved in the operation are: construction site or mine workers, film crews, or wedding guests and others involved in a wedding (facility staff, caterers, etc.). These people are considered part of the operation if they have been briefed on the RPA hazard and have the opportunity to leave the RPA operation site if they are uncomfortable with it. People inside vehicles or inside buildings are not factored into the 30-metre horizontal distance rule (CAR 901.26). Even if an RPA can fly within 30 m of vehicles, buildings, crew members, or other people involved in the operation, this needs to be done safely (CAR 900.06). The RPA pilot should have contingency plans in place in the event that a person not associated with the operation comes within 30 m of the RPA and should be prepared to take immediate action to restore the safety buffer. Some examples of contingency plans may be rerouting the RPA, returning to land, or holding over a secure area until the minimum distance can be restored. Whatever action is taken to maintain the safety distance, the pilot must ensure the RPA does not fly within 30 m of one person while trying to remain 30 m away from another person. Pre-planning and site preparation during the site survey have proven to be effective at reducing the risks associated with maintaining the required 30-metre safety buffer.

Operations between 30 m and 5 m from another person are considered "near people" and are an advanced operation.

To operate an RPA "near people", the RPA pilot needs to:

(a) possess a pilot certificate—advanced operations; and

(b) use the right RPAS in accordance with CAR 901.194 and CAR Standard 922 *Remotely Piloted Aircraft Systems Safety Assurance*. This eligibility is written on the RPAS certificate of registration.

Different Systems for Measuring Distance - km/SM/NM

km: The kilometre is a standard metric measurement that is the most commonly used in the world; 1 km equals 1 000 m. Most maps and software will use the metric system.

SM: The statute mile comes from the imperial system and refers more commonly to the U.S survey mile, which is equal to 5 280 ft or 1 609.347 metres. It is most commonly used in the U.S.A. and the United Kingdom and is still commonly used in aviation.

NM: A nautical mile represents one latitudinal minute of the earth spheroid. The most commonly used spheroid for calculating the nautical mile is the WGS84 geoid, which equates 1 nautical mile to 6 076.1 ft, 1 852 metres, or 1.15 statute mile. It is the main distance unit used in aviation and marine applications.

Two methods can be used to measure distances at the field site without being directly on the ground. Using the scale on your maps or chart, calculate the distance using a metric or imperial ruler and translate the distance calculated on the map. For example, if the map scale is 1:20 000, then 1 linear centimetre calculated on the map represents 20 000 centimetres on the ground. The second method would consist of using an online Geographic Information System platform (e.g. Google Earth and ArcGIS Earth) that has spatial calculation tools that provide instant measurements of the terrain surface.

3.2.15 Site Survey

3.2.15.1 Understanding Your Area of Operation

It is important to understand your area of operation prior to conducting your flight mission. Multiple options are available for this preliminary step, including looking at satellite imagery or topographic/aviation maps and visiting the site in person. Satellite imagery is now freely available on the web through multiple service providers and applications (e.g. Google Earth and Bing). The GeoGratis spatial products portal of Natural Resources Canada also offers free topographic information, Digital Elevation Models (DEMs), satellite imagery, and more. Aviation charts are available at a cost through NAV CANADA and through mobile and web apps. Ensure that these third-party applications are using up-to-date and official NAV CANADA information. It is best to use site coordinates in order to localize the area of operation on a map or other imagery source. If coordinates are not available, using a landmark, nearby structure, or point of reference is a reasonable substitute.

Once the site has been identified, the following points must be defined:

(a) Operation boundaries;

(b) Airspace classes and applicable regulatory requirements;

(c) Routes and altitudes to be followed during the entire operation;

(d) Proximity of traditional aircraft and/or aerodromes;

(e) Location and height of nearby obstacles;

(f) Security measures for warning the public of the RPAS operations site;

(g) Predominant weather conditions for the area of operation;

(h) Minimum separation distances from persons;

(i) An alternate landing site in case of precautionary or emergency landing; and

(j) Aviation maps and symbols.

3.2.15.2 Locating Local Aerodromes and Airports

To identify an aerodrome or an airport, it is recommended that a combination of aeronautical charts and the CFS issued by NAV CANADA be used. The two main charts used by pilots are the VNC, meant for low- to medium-altitude flights at a 1:500 000 scale, and the VTA, meant for providing information about the most congested airspace within Canada at a scale of 1:250 000. The CFS is a reference document updated every 56 days containing all the information relevant to the registered aerodromes and certified airports in Canada. For information regarding water aerodromes, refer to the *Canada Water Aerodrome Supplement* (CWAS).

To identify the different symbols presented on the maps and charts, you should refer to the legend presented in the first pages of the charts and the CFS. Information with regard to date of publication, author, projection, scale, and more would also be found there.

3.2.15.3 Identifying Classes of Airspace

To identify the classes of airspace present at the area of operation, it is recommended that you use resources such as the Drone Site Selection Tool, the NAV Drone Viewer (at <https://www.navcanada.ca/en/flight-planning/drone-flight-planning.aspx>), the CFS, the aeronautical charts of the area of operation, and the DAH. Airspace will be classified according to the Canadian airspace classification (a range from A to G). A basic description of the classes of airspace can be found in subsection 3.2.3.2 of this chapter. Additional information can be found in the DAH and in RAC 2.8.

Anyone holding an RPA pilot certificate (basic or advanced) can operate an RPA within uncontrolled airspace only, in class G and some class F airspace.

For flight within controlled airspace, the RPA pilot must:

(a) possess an RPA pilot certificate—advanced operations;

(b) receive an authorization from the local ANSP; and

(c) use the right RPAS in accordance with CAR 901.194 and CAR Standard 922—*Remotely Piloted Aircraft Systems Safety Assurance*. This eligibility is written on the RPAS certificate of registration.

3.2.16 Other Pre-flight Requirements

Prior to commencing flight the pilot must be satisfied that the RPA has a sufficient amount of fuel/energy to safely complete the flight, the crew members have received sufficient instruction to perform their duties, and any required emergency equipment is on site, with its location and method of operation known and readily accessible.

In addition to the requirements above, the pilot must determine the maximum distance the RPA can safely be flown from the control station for the planned flight. This distance may vary depending on the environment (e.g. visibility, cloud cover, and wind), the location (e.g., a background of buildings can make the RPA difficult to see), and the RLOS (the strength of the radio signal and the presence of interfering signals).

3.2.17 Serviceability of the RPAS

All RPASs, just like all aircraft, must be inspected before flight to ensure they are safe to operate and also after landing at the conclusion of the flight to check that they are safe for the next flight. The RPA pilot is responsible for ensuring that the RPA is serviceable and the RPAS has been maintained (CAR 901.29). The list below is generic in nature but includes points for inspection applicable to most RPAs. For details, refer to the manufacturer's instructions for the specific type of RPAS.

Following the "walk around" or RPAS visual inspection, a fully charged battery can then be installed for the next flight. For a larger RPAS, a normal engine ground run can be carried out on the ground for a check of the flight controls and avionics systems. Just after takeoff, a short test flight and/or a ground run should be completed to make sure all controls and switches are functioning and correct.

3.2.17.1 Airframe (All Types)

Depending on the weight of the aircraft (25kg or less), pick up the RPAS or walk around it and inspect the entire aircraft. Pay attention to the following:

(a) Check all antennas, ensuring they are secure and in good condition;

(b) Check the battery emplacement and secure attachment, and ensure that there are no cracks;

(c) Check that all lights are operating normally;

(d) Check the pitot tube (if applicable) and make sure it is secure and clear of any obstructions;

(e) Check that the GPS is receiving satellites and providing a navigation solution (if applicable).

For fixed wings, check:

(a) Wings, ensuring that they are securely attached to fuselage;

(b) Wing leading edge surfaces;

(c) Top and bottom of wing surfaces;

(d) Wing tip surfaces;

(e) Rear of wing and all flight control surfaces for freedom of movement, security, and any skin damage (composite/metal).

For rotary aircraft:

(a) Inspect the top and bottom of the airframe arms for cracks, loose parts, or signs of damage;

(b) Check that the levels of all fluids (oil/hydraulic fluid) are within limits and ensure there are no leaks.

3.2.17.2 Landing Gear

Check that the landing gear is secure, as applicable.

Larger RPAs may have retractable or fixed landing gear and may have wheel brakes. Check for leaks on oleos and leaks in the brake system as appropriate. Check brake wear indicators if applicable.

For servicing and scheduled maintenance items, always refer to the manufacturer's maintenance manual. If in doubt, contact the manufacturer directly for technical support.

Inspect skids or wheels as applicable depending on type, especially the attachment points, which should be secure with no cracks. In addition, check for cracks in welds.

3.2.17.3 Powerplant

Inspect the following:

(a) Cowling or motor casing as applicable;

(b) Power plant for security of engine mounts;

(c) The presence of any cracks;

(d) All lines, ensuring there are no fluid leaks (fuel, oil, or hydraulic);

(e) All wiring and connectors, ensuring there are no cracks, loose connections, or chaffing;

(f) The oil level, ensuring it is within limits, if applicable.

3.2.17.4 Propellers

Inspect the following:

(a) Spinner(s), if installed, ensuring that they are secure and there is freedom of movement;

(b) The propeller, ensuring it is secure;

(c) The propeller blades, checking for nicks, chips, or cracks, especially on the plastic blades on RPASs weighing 25kg or less. Chips, nicks, or cracks on a plastic blade mean it is time to replace the propeller. For metal blades refer to the manufacturer's instructions to see what the limits are to file the nicks or chips before replacing the propeller.

3.2.17.5 Battery—Lithium Polymer

Inspect the battery for overall condition. There should be no signs of swelling, external leaking, or other defects.

Ensure the battery wiring and connectors from the battery and the aircraft are connected securely.

The battery and spare batteries necessary to complete the operation should be adequately charged before flight to complete the mission.

Be careful not to pinch the wires when installing the battery, attaching the connectors, and closing the battery door.

3.2.17.6 RPAS Control Station/Receiver/Transmitters

The battery and spare batteries (if applicable) necessary to complete the operation should be adequately charged before flight to complete the mission.

Check that all flight interface is functioning normally.

3.2.18 Availability of RPAS Operating Manuals

In order to ensure the RPAS can be operated within the limitations specified by the manufacturer, it is important that the pilot and crew members have access to the most current system operating manuals. These manuals can be available either in digital format or in print; the key is that they are immediately available for the pilot and crew members (CAR 901.30).

Failure to have manuals immediately available could result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.2.19 Manufacturer's Instructions

RPASs are complex systems that have both system and environmental limitations that allow them to operate in a predictable manner. To ensure the maximum reliability of the RPAS it is required that the RPAS be operated in accordance with the manufacturer's operating instructions (CAR 901.31).

Failure to operate the RPAS in accordance with the manufacturer's instructions could result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.2.20 Control of RPAS

RPA pilots are not permitted to operate autonomous RPAs for which they are unable to take immediate control of the aircraft. (CAR 901.32).

Automation (i.e. "automated" or "automatic") refers to a deterministic system that behaves in a predictable manner using pre-set rules. This type of system will always produce the same output given the same set of inputs, user error notwithstanding. An example of this in an RPAS context would be a user plotting a route on the control station and the aircraft following that route on autopilot while the pilot monitors the flight.

In contrast, an autonomous system is goal-based and not deterministic. The path to the desired outcome may not be easily predicted and the system may model behaviours that result in unique outcomes in each instance of operation. An autonomous RPA is one that operates without pilot intervention in the management of the flight, and in fact, there may be no mechanism for pilot intervention by design. An autonomous RPA may react to changing environmental conditions or system degradations in a manner that it determines on its own.

Pilots found to be operating autonomous RPAs for which they are unable to take immediate control are subject to individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.2.21 Takeoffs, Launches, Approaches, Landings, and Recovery

Prior to conducting an RPAS operation the pilot must ensure that there is no likelihood of a collision with another aircraft, a person, or an obstacle and that the site chosen is suitable for the operation (CAR 901.33).

When choosing a site for an RPA's takeoff, launch, landing, or recovery, the pilot should ensure that he or she has the land owner's permission to use the site and that the site is free of obstacles that could interfere with the operation of the RPA. Obstacles include physical obstacles like trees, buildings, or open water as well as non-physical obstacles like electronic or magnetic interference. It is also important that the site selected be secured to ensure bystanders do not venture too close to or enter the take-off or landing area. Securing a site can be done by erecting physical barriers to ensure the public does not access the area during the operation or by having crew members perform a crowd control function. It is important that the RPA pilot understand and follow any municipal, provincial, and federal laws and regulations when securing a site. In some situations, restricting public access to a site may not be allowed.

3.2.22 Minimum Weather Conditions

The weather is a primary concern for pilots of all types and should be something of which they have a thorough understanding. The minimum weather requirements for RPA pilots are different from those of more traditional aircraft pilots, even for larger RPAs. Sufficient weather conditions must be present to ensure that the RPA can be operated in accordance with the manufacturer's instructions (i.e., temperature, wind, precipitation, etc.) and to allow the pilot or visual observer to keep the RPA within VLOS at all times.

3.2.22.1 Sources of Weather Information

Climate data, weather forecasts, and real-time weather conditions are a central pillar of every aeronautical operation. Aircraft are particularly vulnerable to the elements due to the medium in which they operate, as the atmosphere does not provide any shielding from the weather. Various sources of information are available for monitoring weather and ensuring the safe conduct of the RPAS operations. Depending on the time scale at which the weather or climate needs to be determined, different sources of weather information might be required.

For climatic and long-term predictions of a few months or more Environment and Climate Change Canada's (ECCC) *Canadian Climate Normals* is available on the ECCC Web site: <https://weather.gc.ca/canada_e.html>. This tool is more suitable for evaluating whether operations at a given time/location would be possible given the historical climatic patterns. This should be used as a means of evaluation for long-term operation planning and/or in Canadian regions where pilots are not familiar with the weather patterns at a given time. The portal gives pilots access to a large array of data and graphs giving punctual measurements of weather conditions along the Canadian weather stations system. Data is freely available to download in .csv format. Thirty-year averages (1981-2010/ 1971-2000/ 1961-1990) are also available for analysis. For example, this would help a pilot to establish when the ground is snow-free and the air temperature is above 5°C according to the last 30 years, permitting the planning mission in advance.

For medium- to short-term predictions of the weather, multiple online and broadcast versions exist. ECCC offers daily weather forecasts as well as forecasts up to two weeks in advance on its Web site, <https://weather.gc.ca/canada_e.html>. Weather radar data is available for up to three hours, and satellite imagery is offered at varying time intervals for the present day. This source of weather information can be used for mission planning and/or the same day.

For same-day weather information, one of the most detailed sources of information is on the NAV CANADA CFPS at <https://plan.navcanada.ca>. This Web site is one of the main sources of weather forecasts, reports and charts used for flight planning by aviation professionals. For more information regarding how to interpret different charts and reports, and the general procedures associated with the Web site, see the MET—*Meteorology* chapter of the TC AIM.

Additionally, there are a variety of weather apps available that pull weather data from a variety of sources. Check to ensure you are using NAV CANADA official data whenever possible.

Finally, no matter what tool is used, which preparations have been made, and what the given predictions are for the day of operation, it is essential to evaluate the weather at the site before launching the operation. Weather is a complex science and can be subject to unpredicted fluctuations, especially on a small geographic scale. Never operate an RPAS if the weather on site is outside your manufacturer's recommended operating limits,

or if you judge based on your experience that local weather could adversely affect your flight, even if the weather forecasts say otherwise.

3.2.22.2 Micro vs. Macro Climate Environments

Micro Climate

Micro climate is defined as climatic variations localized in a small or restricted area that differs from the surrounding region. It is important to consider small climatic variations when planning RPAS flights. The altitude, nearby water bodies, topography, ground surface, and obstacles are all factors that can and will influence the conditions experienced at a specific site. Those variations might manifest themselves in the form of variable wind strength and/or directions, convecting/advecting air movements, variable temperatures, localized precipitation, variable visibility levels, and more. These must be considered carefully; weather forecasts for the region might be good, but localized variations might compromise flight operation safety.

Due to the nature of most RPAS VLOS flights, which are flown at low altitudes and over short distances, it is most likely that the pilot will experience some impact from the micro climate at the site. Recognizing factors that might influence weather patterns at the site prior to takeoff will help mitigate possible accidents or annoyances during the operations. Due to the high variability of micro climate it is hard to establish the site-specific conditions on a given day, before being physically there.

Macro Climate

A macro climate will describe the overall climate of a large area and represents the normal climatic patterns. This is what the pilot needs to consider as the general pattern for the operation, and it serves as a first step when considering weather information in flight planning. As mentioned above, the low flight altitude of most RPASs makes it more likely they will be subject to micro climatic variations. Macro climate will be more significant for beyond visual line-of-sight (BVLOS) flight over a large area, as a simpler means to evaluate weather due to the altitude and distance covered by the RPAS.

3.2.22.3 Wind

RPA pilots should refer to the manufacturer's RPAS operating/flight manual with regards to the aircraft's wind speed tolerance. If no such recommendation is made, the pilot should exercise common sense and avoid conducting an RPAS flight in winds that might compromise safety.

Wind is the movement of air across the earth's surface and is one of the most important weather phenomena for pilots of all types of aircraft. Wind speeds are expressed in kilometres per hour (km/h) or knots (kt) and the direction will represent where winds originated.

RPA pilots will most likely be subject to surface wind, which generally extends a couple thousand feet AGL. Surface winds vary depending on surface roughness, temperature, waterbodies, and obstacles (see the paragraph on micro climate above), and they can therefore be very different from one geographical location to the next. Wind speed in aviation weather forecasts is usually expressed in knots and is classified according to the Beaufort Wind Scale (see AIM MET 2.6 Pilot Estimation of Surface Wind), which is a scale ranging from breeze to hurricane.

Upper-level winds will not influence the vast majority of RPA pilots as the altitude is much higher than standard flight altitude. However, BVLOS flights with a large RPAS and a specially trained crew might be conducted within this environment.

3.2.22.4 Visibility

For an RPAS flight conducted in VLOS, visibility should be at a minimum equal to or greater than the extent of the desired operation. While there is no minimum visibility prescribed in Part IX of the CARs, the visibility must be sufficient to keep the RPA in VLOS at all times.

Visibility is dynamic, can change rapidly, and might require the pilot to adjust or end an ongoing operation if conditions change. Local factors such as waterbodies and topography might create heterogeneous visibility levels on a large or small scale. Flight planning should take those variables into consideration.

3.2.22.5 Clouds

RPA pilots are prohibited from entering clouds as the RPA would no longer be within VLOS.

Clouds are a great source of meteorological information for pilots since they are a direct manifestation of the atmospheric conditions at a given moment. Clouds are classified as low, middle, or high altitude clouds and vertical development clouds. The cloud ceiling is important information for RPAS flight and is established based on the lowest layer of clouds on that day. Cloud conditions and types will be influenced by the presence of weather fronts, atmospheric pressure, winds, and topography. Information regarding cloud conditions for a given day can be found on the CFPS Cloud and Weather chart. For more information on this matter, please see MET–*Meteorology* 4.11 Clouds and Weather Chart of the TC AIM.

3.2.22.6 Precipitation

In the absence of manufacturer guidelines for flights in precipitation, it is recommended that pilots avoid flying in precipitation as it might compromise the airworthiness of the aircraft and create hazards.

Precipitation is atmospheric water vapour produced from condensation that falls under gravitational force toward the ground. Precipitation will manifest itself in liquid (drizzle and rain) or solid forms (hail, snow pellets, snow ice prisms, and ice pellets) and will have significant impact on RPAS operations. Exposure to precipitation can impact an RPAS' ability to perform as expected. RPASs have varying levels of tolerance with respect to precipitation. Refer to the RPAS manufacturer's operating/flight manual to verify the aircraft capability in precipitation.

3.2.22.7 Fog

Do not operate an RPAS in fog if visibility is too poor to maintain proper VLOS with the RPA, even if it is equipped with lights.

Fog represents condensed water droplets found at the ground level, or in other words, a low-level cloud. It usually brings precipitation in the form of drizzle and will cause low visibility conditions at ground level. This is of high concern for RPAS operations in VLOS, as direct visual contact will be greatly reduced in fog. Fog is dynamic, thus conditions at takeoff might change during the operation and cause a threat to the RPA, traditional aircraft, and the public.

3.2.22.8 Temperature

Air temperature is also an important concept for RPA pilots. Since the human body is accustomed to a narrow temperature range, cold temperature can physically impair the efficiency of pilots and ground crews if they are not dressed properly. A pilot's dexterity can decrease significantly and cold temperature stress can add to other stress, such as that caused by fatigue. Cold temperature will directly affect all other components of the weather system and thus have a great impact on the aircraft itself. You must operate the RPAS within the operational limits set by the manufacturer of the RPA, as each aircraft will have a different range of temperature tolerance. Operating an RPA outside of those suggested ranges will compromise the airworthiness and safety of the aircraft, and your operation. It is also important to consider that RPASs are multi-component systems. Although the aircraft might be approved for a certain temperature range, other parts of the system might not be—particularly if you have made any modifications to the payload or aircraft. Consider all components when assessing flight suitability in the field.

RPASs are operated within the airspace and are therefore subject to atmospheric temperature changes, due to the adiabatic lapse rate. Under normal conditions, atmospheric air temperature will decrease with an increase in altitude due to lower atmospheric pressure. This phenomenon is called the adiabatic lapse rate. Water vapour content within the air column will decrease the lapse rate experienced, as more latent energy is required for an equal change in temperate change in moist air. The adiabatic lapse rate of unsaturated air is 3°C/1 000 ft and1.5°C/1 000 ft for saturated air. Those values are set as standard but will be variable in real-world scenarios as the water content will dictate the precise lapse rate value. RPA pilots need to take the lapse rate into consideration if operating in high-altitude BVLOS flight or within a high-altitude environment as the weather forecast and the conditions experienced by the aircraft might differ greatly.

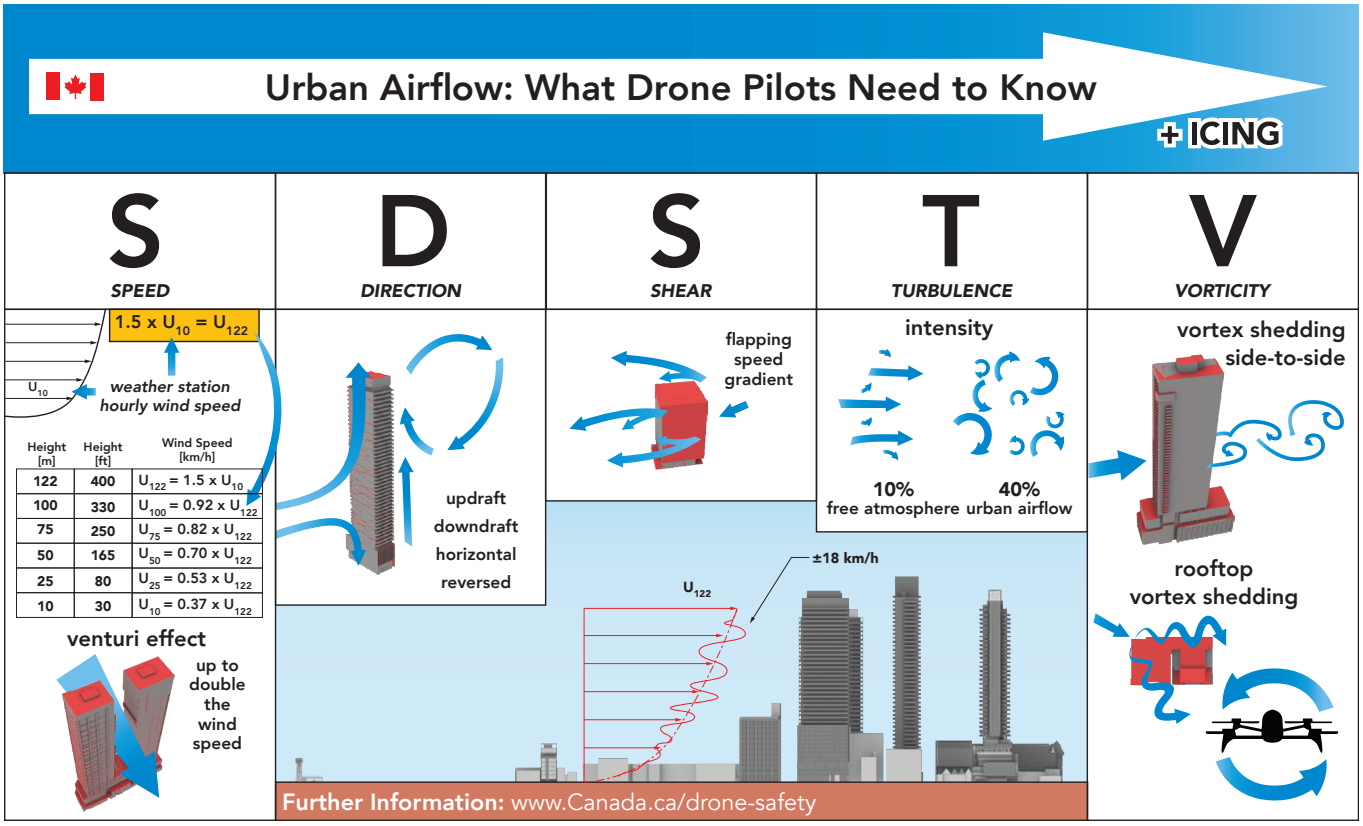
3.2.22.9 C2 link tips for urban environments

Learn about the C2 challenges drone pilots can face during urban operations.

<https://tc.canada.ca/en/aviation/drone-safety/learn-rules-you-fly-your-drone/tips-best-practices-drone-pilots/command-control-c2-link-tips-safe-drone-operations-urban-environments>

3.2.22.10 Urban Airflow

Figure 1.1—Urban Airflow Characteristics, SDSTV



TC would like to remind you of the potential environmental challenges of flying an RPA in urban areas. Provided you are authorized to fly an RPA in urban areas, exercise caution when flying due to unforeseen changes in wind characteristics caused by tall buildings and structures. These changes can include increased wind gusts exceeding the RPA limits, as well as shifts in direction, which can blow the RPA off course.

TC worked with NRC on a video to help you understand some of the impacts: <https://tc.canada.ca/en/aviation/drone-safety/tips-best-practices-drone-pilots/urban-airflow-what-drone-pilots-need-know>. Supporting research document: NRC. "Urban airflow: what drone pilots need to know," *NRC Publications Archive* [Website], URL: https://nrc-publications.canada.ca/eng/view/object/?id=2accdd91-235d-4af3-9924-cf058c47e30a.

3.2.22.11 Sun

Sun will influence the conditions encountered by the RPAS in direct and indirect ways. The pilot and visual observers need to be aware of the sun glare that might prevent them from maintaining proper visual line-of-sight with the RPA. Crew members should take care to reduce the amount of time facing into the sun and looking at the sky. In the event that the RPA is flying in line with the sun, the crew should stare to the side of the aircraft and the sun. Polarized sunglasses can cause visibility issues on tablet displays, so they may not be a viable option for all crew members.

Solar activities can also create geomagnetic interferences that have been shown to impact the navigation system (e.g., GPS, GLONASS) and electronic components of the RPAS, specifically the C2 link. For more information about the solar activity forecast in Canada, refer to the Space Weather Canada forecast Web site:

<www.spaceweather.gc.ca/index-en.php >
<https://www.spaceweather.gc.ca/forecast-prevision/index-en.php>

It is recommended that pilots refer to the Energetic Electron Fluence forecast and use caution in periods of moderate or higher radiation. The greater the electron fluence, the lesser the range and quality of the C2 link, and the greater the possibility of lost link.

3.2.23 Icing

Icing refers to atmospheric water droplets that are often defined as supercooled (< 0 °C), which freeze upon contact with a surface. Icing intensity is classified from trace to severe and icing types are rime, clear, and mixed ice. Icing is common on all types of aircraft and RPAs are no exception. Icing can occur before and during the flight, greatly compromising the ability of the aircraft to operate properly. Formation of ice on the propeller and frame of the aircraft will increase take-off weight, change the aircraft's aerodynamic properties, and prevent components from operating

properly. Critical surfaces such as wings, control surfaces, rotors, propellers, and horizontal and vertical stabilizers should all be confirmed clear of contamination prior to takeoff and must remain so, or the flight be terminated. Refer to the RPAS operating/flight manual provided by the manufacturer to verify the aircraft's tolerance of icing. In the absence of an RPAS Safety Assurance, it is recommended that you avoid flying in icing conditions unless a method exists to de-ice and provide anti-ice capabilities in flights. For more details about icing, please see MET—*Meteorology* subpart 2.4 of the TC AIM.

3.2.24 Formation Flight

Formation flights between two or more RPAs or between an RPA and another aircraft are permitted. If a formation flight is to be undertaken, it must be pre-arranged; impromptu formations are not permitted (CAR 901.36). Formation flights of more than 5 RPAs at a time are only authorized under an SFOC—RPAS (CAR 901.40(2)).

The purpose of the pre-arrangement requirement is to ensure that all the pilots associated with the operation are aware of how the aircraft are to be flown to eliminate the risk of collision (CAR 901.18 prohibits the operation of an RPA in such proximity to another aircraft as to create a risk of collision) and to identify and mitigate any risks associated with the flight.

3.2.25 Operation of Moving Vehicles, Vessels, and Traditional Aircraft

Pilots are prohibited from operating an RPA while at the same time operating a moving vehicle (CAR 901.37). If it necessary to operate an RPA from a moving vehicle, there must be a dedicated person operating the vehicle while the pilot operates the RPAS. If a visual observer is used in the operation, they are also prohibited from operating the vehicle while performing their duties as a visual observer (CAR 901.20(4)).

When launching from a vehicle (e.g. a boat) that is in motion or that will be in a different location when the RPA is recovered, consider that the return to home (RTH) automatic function may register the initial position at takeoff. Some RPASs give you the option of using the launch point or alternatively, going to the location of the transmitter. Plan ahead for manual landing, or other landing procedures, in a specifically designated location and adjust the contingency plans to avoid having the RPAS return to a dangerous location.

Failure to abide by these prohibitions may result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.2.26 First-person View (FPV) Devices

FPV offers an immersive RPA piloting experience but cuts the pilot off from his or her surroundings and greatly affects detect and avoid capability (i.e. the pilot's ability to scan for other aircraft). If you are using an FPV system that reduces the field of view of the pilot, visual observers must be used. The number of visual observers needed will depend on the complexity and area of the operation. The area surrounding the pilot should also be safe and free of hazards, as the FPV will also prevent the pilot from being aware of his or her own surroundings.

3.2.27 Night Flight

There are risks associated with night flight that result from operating in an environment of reduced visibility. From the RPA pilot's perspective, the greatest concern is maintaining VLOS with the RPA and detecting and avoiding unlit objects on or near the ground like trees and power lines.

Night is legally defined in aviation as the period of time that starts at the end of evening civil twilight and ends at the start of morning civil twilight. In the evening, civil twilight ends when the centre of the sun's disc is 6° below the horizon and is descending, approximately 25-35 min after sunset. In the morning, civil twilight begins when the centre of the sun's disc is 6° below the horizon and is ascending, approximately 25-35 min before the sunrise. The evening civil twilight is relative to the standard meridians of the time zones, the period of time that begins at sunset and ends at the time specified by the Institute for National Measurement Standards of the Standards Council of Canada and available at: <https://www.nrc-cnrc.gc.ca/eng/services/sunrise/index.html>.

Night, in practice, is when you cannot effectively see the hazards that would be visible during the day. In these situations, a day site survey is advisable to ensure separation between the RPAS flight path and any dangers that are not visible.

Night operations are permitted in both the basic and advanced operating environments provided that the RPA is equipped with position lights sufficient to allow the aircraft to be visible to the pilot and any visual observer.

3.2.27.1 Detecting Aircraft During Night Operations

Scanning Technique

The approach to scanning the sky for aircraft at night is much the same as scanning the sky during the day; however, limitations of equipment and human physiology should be taken into account. With sufficient lighting on the aircraft, it is very often easier to track your aircraft and other aircraft than doing so during the day.

Aircraft are easier to identify at night, but it is more difficult to determine the range of these aircraft. It is therefore possible the RPAS could be within VLOS, but much farther away than what would be by day operations.

Traditional aircraft will also be easier to detect but may be at a greater distance and appear much closer than they actually are.

Depth perception at night is difficult, which affects the assessment of relative position. Although it may be easier to spot aircraft lights at night, judging the distance to an aircraft is challenging.

Noise

In some cases sound may be the only way to detect other aircraft when operating at night. For this reason it is important that the crew enforce a sterile environment around the control station and anywhere visual observers are stationed. Any unnecessary talking or noise should be avoided to ensure the best chance of

detecting other aircraft. Sound is also useful to monitor your own aircraft's performance when visual cues are limited. Rapidly changing motor sounds on a multirotor may indicate wind at altitude, for example.

Vision

Vision can be affected at night, and there are several illusions that can affect the pilot or observer's ability to detect aircraft. Additional information on vision can be found in AIR 3.5 Vision of the TC AIM.

3.2.27.2 Aircraft Lighting

Traditional aircraft are equipped with special lights to aid in their detection and orientation. Traditional aircraft are required to have position lights, which include a red light on the port side (left side when sitting in the pilot's seat), a green light on the starboard side (right side when sitting in the pilot's seat), and a white light on the tail. An observer can determine which way an aircraft is travelling by identifying the lights they can see. For example, if the observer can see a red and white light, the aircraft is travelling across their field of view from right to left and moving away from them. If the observer can see only a green light the aircraft is moving across their field of view from left to right and may be moving towards them. If the observer can see both a green light and a red light, the aircraft is coming at them.

Aircraft are also equipped with anti-collision lighting, typically an omnidirectional rotating or flashing red beacon. This light can be affixed to either the top or bottom of the aircraft. Some aircraft are equipped with strobe lights, landing lights, or recognition lights. Strobe lights are generally white and attached to the wing tips or the sides of the aircraft. They flash in a repeating pattern and make an aircraft very visible, especially at night. Landing lights are generally white and affixed to the inboard sections of the wing, the front of the fuselage, or the landing gear. Landing lights will be brightest when an aircraft is coming towards the observer. Not all aircraft will have landing lights on when flying at night so they should not be relied upon to detect aircraft. Recognition lights are generally white and affixed to the sides of the aircraft. Unlike strobe lights, they do not flash and generally point in the direction of flight much like a landing light.

Not all aircraft are required to have lights when operating at night. Some aircraft such as those used by law enforcement pilots, military, and first responders may have mission requirements that necessitate operations without lights. RPA pilots and visual observers should be particularly alert for an aircraft that may only be identifiable by sound.

3.2.27.3 Use of Lights

Pilots operating RPASs at night shall ensure their RPA is lighted sufficiently to ensure the pilot and the visual observer (if used) can maintain VLOS with the RPA. It's the pilot's responsibility to ensure the lights are functioning prior to takeoff or launch.

3.2.27.4 Night Vision Goggles

Night vision goggles can be used to supplement the RPAS crew's view of the RPA but caution should be exercised as night vision may inhibit the pilot's ability to detect and avoid other aircraft. Many aircraft are equipped with LEDs instead of the traditional incandescent lights. These LED lights may emit light that is outside the combined visible and near infrared spectrum of night vision goggles and, as a result, may not visible. For this reason it is required that all RPA crews have a method of detecting all light within the visible spectrum. The simplest way to meet this requirement is to employ a visual observer using unaided vision as part of the detect and avoid system.

3.2.28 Multiple Remotely Piloted Aircraft (RPA)

Pilots may operate up to five RPAs from one control station provided the system is designed for such an operation (CAR 901.40). Special care must be taken when operating more than one RPA from a single control station as there is a significant risk the pilot can become distracted and lose track of one or more of the RPAs.

The risks associated with this type of operation can be mitigated by careful pre-planning and site surveys. Pilots should take extra care to ensure that sufficient visual observers are employed to ensure that each aircraft is kept within VLOS and monitored.

Piloting more than five RPAs from one control station requires an SFOC—RPAS (see subpart 3.6).

3.2.29 Special Events

3.2.29.1 Special Aviation Events

An SFOC—RPAS for a special aviation event is needed when a pilot is operating an RPA as a performer in this event (referred to as an "airshow"). See CARs 603.01 and Standard 623.01 at <https://lois-laws.justice.gc.ca/eng/regulations/SOR-96-433/FullText.html#s-603.01>.

If the RPAS operation is not a performance that is part of the special aviation event (i.e., the operation is conducted for taking videos or photos of the event, or for surveillance or security purposes), the SFOC—RPAS application is to be processed as it would be for an advertised event.

3.2.29.2 Advertised Events

An SFOC—RPAS for an advertised event is needed when a pilot is operating an RPA less than 100 ft away from the boundaries of an advertised event (CARs 901.41 and 903.01(b)). For reference, see also the following subsections and subpart in this chapter: 3.4.4.4 *Small RPA — VLOS Operations Less Than 100 ft But More Than 16.4 ft of Any Person*, 3.4.4.5 *Small RPA — VLOS Operations Less Than 16.4 ft of Any Person* and 3.6 *Special Flight Operations—RPAS*.

Since April 1, 2025, new paragraph 903.01(b) requires a SFOC—RPAS for the operation of an RPA having an operating weight of less than 250 g (0.55 lb) at an advertised event.

As per the CARs 900.01 definition, an advertised event "means an outdoor event that is advertised to the general public, including a concert, festival, market or sporting event." An amusement park is also considered an advertised event.

The boundaries of an advertised event are defined by perimeter fences and the gates where people are controlled by the event personnel, volunteers, security guards or peace officers.

Where no such perimeter is defined for outdoor advertised events like marathons, triathlons, cycling, swimming, skiing, fishing derbies, sailing, cruise ships, fireworks, protests, picket lines, and so on, it is expected that the boundaries of the advertised event be at least 100 ft from people participating in the advertised event and 100 ft from the track of the sporting event for all categories of RPA pilot certificates and models of RPAs.

Guidance on advertised events and SFOC—RPAS applications is available on the TC drone safety Web site at <https://tc.canada.ca/en/aviation/drone-safety/drone-pilot-licensing/get-permission-special-drone-operations>.

The operation on an RPA at an advertised event without an SFOC—RPAS can result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000 for a less than 250 g RPA and up to $3,000 and/or corporate penalties of up to $15,000 for a 250 g and above RPA.

3.2.30 Handovers

If an RPAS command handover is to be conducted during the operation, a handover plan agreed upon by all responsible parties has to be established before takeoff (CAR 901.42). The plan must lay out the procedures to follow for the handover, the plan to mitigate the loss of control during the handover, and the plan for how the see and avoid measures are to be continued during the exchange.

3.2.31 Payloads

Laser-based systems, including LIDAR, are becoming increasingly popular payloads on RPASs for a number of operations. Class 1 lasers, as designated by Health Canada, are considered to be incapable of causing harm and will not create a hazard to traditional aircraft provided that they are operated as per the manufacturer's specifications. If the laser equipment that the operator intends to use is classified as Class 1 or Class 1M, or has an average output power of less than 1 mW, and/or utilizes a non-visible beam, no further assessment or notification is required. The operator is still responsible for safe operation within the bounds of the manufacturer's specifications and operating instructions.

Operators who want to operate an RPAS fitted with laser equipment other than the types noted in the previous paragraph in accordance with the manufacturer's instructions must notify TC that they intend to operate a laser in airspace shared with traditional aircraft (CAR 601.21). RPAS operators shall complete a Notice of Proposal to Conduct Outdoor Laser Operation(s) and submit it to their TC regional office. An aeronautical assessment is then conducted and the NOHD calculated by the operator is validated. The normal processing time is at least 30 days to review the notification and determine if a laser authorization can be issued.

For more information and further guidance on the regulation of lasers, refer to sections 601.20, 601.21, 601.22, and 901.43 of the CARs.

In addition, if the RPA pilot intends to carry or deliver payloads with an RPA, the pilot must also comply with the *Transportation of Dangerous Goods Regulations* (TDG Regulations) and the Canadian Transportation Agency's (CTA's) *Air Transportation Regulations* (ATR), as applicable.

More information on the TDG Regulations can be found in RAC Annex 12.3 and at <https://tc.canada.ca/en/dangerous-goods/transportation-dangerous-goods-canada>.

More information on the CTA's ATR can be found at <https://www.canada.ca/en/transportation-agency.html> and <https://laws-lois.justice.gc.ca/eng/regulations/SOR-88-58/index.html>.

RPA are considered aircraft according to the CARs. The *Transportation of Dangerous Goods Act* (TDG Act) (by air) and the CTA detail various requirements for when products or people are transported by aircraft. As the Act and the Agency do not separate RPA and simply use the term "aircraft," this also includes remotely piloted aircraft.

Before transporting items of any kind from one location to the next, the CTA's ATR must be considered. This is outside of the scope of Part IX of the CARs but is applicable if you are operating an RPA under Subpart 1 of Part IX of the CARs (901.xx), or with an SFOC—RPAS issued under section 903.03. There are exceptions within the CTA's ATR that may be applicable in some cases, which is why the CTA's ATR need to be considered for all operations.

Before transporting goods that may be considered dangerous, the TDG Act must be consulted. If the goods are in fact dangerous, the TDG Act explains what is required. CAR 901.43 explains when an SFOC—RPAS is needed to transport payloads that are also considered dangerous. This includes explosive, corrosive, flammable, or biohazardous material, and weapons, ammunition, or other equipment designed for use in war. An effort was made to link the TDG Act with section 901.43, but this has not been finalized. In other words, there may be situations that require an SFOC—RPAS under CAR 901.43(2)) but are outside of the TDG Act for some reason. There may be other situations that do not require an SFOC—RPAS under CAR 901.43 but do require operation under the TDG Act.

It is the responsibility of the RPA pilot to ensure compliance with all regulations before an RPAS operation.

A pilot may operate an RPAS when the aircraft is transporting a payload referred to in CAR 901.43(1) if the operation is conducted in accordance with an SFOC—RPAS. For more information, see section 3.6.1 of this chapter.

3.2.32 Flight Termination Systems

A Flight Termination System is a system that, upon initiation, terminates the flight of an RPA in a manner so as not to cause significant damage to property or severe injury to persons on

the ground. In order to avoid flyaway situations and safeguard other airspace users, RPASs that lack redundancies may need to have an independent flight termination system that can be activated by the RPA pilot. The process and procedures for initiating and activating a flight termination system vary significantly depending the manufacturer and operating procedures for each system. Initiation of a flight termination system may only be done if it does not endanger aviation safety or the safety of any person (CAR 901.44). Attachment of a flight termination system to an RPAS which is not standard equipment for the RPAS is a modification and must meet the requirements of CAR 901.70.

3.2.33 Emergency Locator Transmitters (ELT)

RPAs are prohibited from being equipped with ELTs (CAR 901.45).

RPAs are permitted to have other types of tracking devices that would allow pilots to locate them without notifying first responders.

ELTs provide an emergency signal to SAR in the event of a missing aircraft. In order to ensure valuable resources are not dispatched to find missing aircraft where no life is at stake, RPAs are not permitted to have ELTs on board. More information on ELTs can be found in SAR part 3.0 Emergency Locator Transmitter (ELT) of the TC AIM.

Pilots operating RPAs equipped with ELTs are subject to individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.2.34 Transponders and Automatic Pressure-Altitude Reporting Equipment

Transponders augment the capabilities of ATS surveillance, allowing ANSPs to determine an aircraft's position and, when a transponder is capable of pressure-altitude reporting, its altitude. Small RPAs are not typically equipped with transponders and, as a result, they pose a challenge from an air traffic surveillance perspective due to their small size, low operating altitude and lack of a common altitude reference system. For that reason, ANSPs cannot offer these aircraft the same, traditional air traffic services (i.e. aircraft separation or conflict resolution) that they provide to VFR or IFR aircraft.

In order to ensure the safe operation of all aircraft in controlled airspace, RPAs need to obtain authorization from the ANSP (either NAV CANADA for civil-controlled airspace or the Department of National Defence in the case of military-controlled airspace) before operating in controlled or transponder airspace.

3.2.34.1 Transponder-required Airspace

Transponders are required in all Class A, B, and C airspace as well as some Class D and Class E airspace. The requirement for a transponder in Class D and E airspace can be found in the DAH (CAR 601.03). Additional information can be found in COM subpart 8.2 of the TC AIM.

3.2.34.2 Transponder Requirements

ANSPs may allow an RPAS to enter transponder-required airspace without a transponder if the pilot requests permission prior to entering the area and aviation safety is not likely to be affected (CAR 901.46(2)). Except when permitted by the ANSP, all aircraft flying in transponder-required airspace including RPAs are required to have transponders (CAR 901.46(1)).

The decision as to whether aviation safety is likely to be affected depends on a variety of factors that may not be readily apparent to the RPA pilot. These factors may include the volume of air traffic in the area, a potential emergency or priority situation, system capability, equipment failures, and a myriad of other factors. RPA pilots should understand that ANSPs may not be able to grant all requests to enter transponder airspace without a transponder. Flexibility and patience on the part of the pilot will be required.

Entering transponder airspace without a transponder or without permission from the ANSP puts other aircraft in the area at risk and may result in individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.2.35 Operations at or in the Vicinity of an Aerodrome, Airport or Heliport

Operations in the vicinity of or at aerodromes, water aerodromes, airports and heliports are higher risk. Operations inside a 3 NM (5.6 km) radius from the centre of airports or a 1 NM (1.8 km) radius from the centre of heliports are prohibited to RPA pilots holding a basic certificate (CAR 901.47) and are reserved for advanced or level 1 complex RPA pilot certificate holders.

RPA pilots shall always keep the RPA in VLOS, shall give way at all times to traditional aircraft, and shall not interfere with an aircraft operating in the established traffic pattern (CARs 901.11, 901.17, 901.18 and 901.47).

When operating an RPA at or in the vicinity of an aerodrome, water aerodrome, airport or heliport, the RPA pilot should contact the aerodrome operator to inform them of the RPAS operation, regardless of whether the RPA is operated in controlled or uncontrolled airspace.

Although aerodrome operators can prohibit someone from using their premises, they cannot forbid the use of the airspace surrounding an aerodrome, airport or heliport. Airspace access is regulated through the CARs, and any aircraft or pilot meeting the requirements therein could use the airspace.

Please note that aerodrome, water aerodrome, airport and heliport operators don't have access to NAV Drone RPA flight authorization information. If you choose to operate your RPA in one of these areas and see traditional aircraft operating, it is recommended to land the RPA and reassess the situation. If you notice regular aircraft activities at a location, it is recommended to contact the aerodrome operator to better understand the local traffic circuit procedures and to coordinate your RPA operations.

The RPA pilot should also maintain a listening watch of the applicable aerodrome traffic frequency found in the CFS or on VNCs. Any person operating a VHF radio must hold an

ROC-A. TC AIM COM 1.0, NAV CANADA's *VFR Phraseology Guide*, and ISED's study guide RIC-21 for the ROC-A provide additional information on radiotelephony procedures.

If an aerodrome, water aerodrome, airport or heliport is located inside controlled airspace, the RPA pilot needs an advanced or a level 1 complex RPA pilot certificate being in an advanced environment and shall receive an authorization from the appropriate ANSP. This is described in section 3.4.1.6 of this chapter and requires a manufacturer declaration that the RPAS meets the appropriate safety assurance profile for controlled airspace, as described in section 3.4.4 of this chapter. See subsection 3.2.3.2 and section 3.4.1.6 for information about RPA operation in controlled airspace. See also section 3.4.1.2 of this chapter for information on how to conduct an RPAS operation in accordance with the established procedure when at or in the vicinity of an airport or heliport (as per CAR 901.73).

An aerodrome means any area of land, water (including the frozen surface thereof) or other supporting surface used, designed, prepared, equipped or set apart for use either in whole or in part for the arrival, departure, movement or servicing of aircraft and includes any buildings, installations and equipment situated thereon or associated therewith. All registered, certified and military aerodromes are listed in the CFS or the CWAS.

An airport means an aerodrome in respect of which an airport certificate issued under Subpart 302 of the CARs is in force. To know if an aerodrome is registered, certified as an airport or heliport or as a military aerodrome, look for the word "Reg," "Cert" or "Mil" in the OPR section of the CFS. You can also find this information with the NRC drone site selection tool at <https://cnrc.canada.ca/en/drone-tool/> or with the NAV Drone Viewer at <https://map.navdrone.ca/>.

A heliport means an aerodrome in respect of which a heliport certificate issued under Subpart 305 of the CARs is in force.

An operation conducted within 3 NM (5.6 km) of the center of an aerodrome under the authority of the Minister of National Defence (look for "Mil" in the OPS section of the aerodrome in the CFS) is possible if authorized to do so by the Department of National Defence. If a military aerodrome is located in controlled airspace, it is advanced operations. The pilot needs a pilot certificate for advanced operations or for level 1 complex operations and must use an RPAS equipped with a manufacturer declaration with the appropriate safety assurance profile as per 901.69, as described in section 3.4.4 of this chapter.

3.2.36 Records

Every owner of an RPAS shall keep a record containing the names of the pilots and other crew members who are involved in each flight and, in respect of the system, the time of each flight or series of flights. This record shall be available to the Minister on request and is retained for a period of 12 months after the day on which it is created (CAR 901.48 1)(a)).

Every owner of an RPAS shall keep a record containing the particulars of any mandatory action and any other maintenance action, modification, or repair performed on the system, including the names of the persons who performed them and the dates they were undertaken. In the case of a modification, the manufacturer and model, as well as a description of the part or equipment installed to modify the system and, if applicable, any instructions provided to complete the work are required. This record shall be available to the Minister on request and is retained for a period of 24 months after the day on which it is created (CAR 901.48(1)(b)).

Every owner of an RPAS who transfers ownership of the system to another person shall also deliver to that person at the time of transfer all of the records containing the particulars of any mandatory action and any other maintenance action, modification, or repair performed on the system (CAR 901.48(3)).

3.2.37 Incidents and Accidents

A pilot who operates an RPA shall immediately cease operations if any of the listed incidents or accidents (CAR 901.49(1)) occur, until such time as an analysis is undertaken as to the cause of the occurrence and corrective actions have been taken to mitigate the risk of recurrence:

(a) injuries to any person requiring medical attention;

(b) unintended contact between the aircraft and persons;

(c) unanticipated damage incurred to the airframe, control station, payload, or command and control links that adversely affects the performance or flight characteristics of the aircraft;

(d) any time the aircraft is not kept within horizontal boundaries or altitude limits;

(e) any collision with or risk of collision with another aircraft;

(f) any time the aircraft becomes uncontrollable, experiences a flyaway, or is missing; and

(g) any incident not referred to in paragraphs (a) to (f) for which a police report has been filed or for which a CADORS report has resulted.

The RPA pilot shall keep a record of the incident or accident analyses for a period of 12 months after the day on which the record is created and make it available to the Minister on request (CAR 901.49(2)).

If any incident or accident occurs while an RPA is being operated under an SFOC—RPAS, it shall be reported to TC using the RPAS Aviation Occurrence Reporting Form sent with the issuance of the SFOC—RPAS.

An RPA is considered an aircraft within the meaning of the Canadian Transportation Accident Investigation and Safety Board Act. All aviation occurrences mentioned in subsection 2(1) of the Transportation Safety Board Regulations involving a RPA, regardless of its weight, must be reported to the TSB. However, the TSB has the discretion to decide which transportation occurrences it will investigate. In cases involving RPA, the TSB will investigate accidents and incidents in which:

(a) an RPA weighing more than 25 kg is involved in an accident, as defined by paragraph 2(1)(a) of the TSB Regulations; or

(b) a person is killed or sustains a serious injury as a result of coming into direct contact with any part of a small RPA

(an aircraft with a maximum take-off weight of at least 250 g [0.55 lb] but not more than 25 kg [55 lb]), including parts that have become detached from the small RPA; or

(c) a collision occurs between an RPA of any size or weight and a traditional aircraft.

The purpose of an aviation safety investigation into an aircraft accident or incident is to prevent a reoccurrence; it is not to determine or assign blame or liability. The TSB, established under the CTAISB Act, is responsible for investigating all aviation occurrences in Canada involving civil aircraft registered both in Canada and abroad. A team of investigators is on 24-hr standby.

TC AIM GEN 3.0 provides additional information on aircraft accident reporting to the TSB, including time limits and what information to report. An RPA is defined as an aircraft in the CARs.

3.2.38 Tethered Remotely Piloted Aircraft (RPA)

CAR 101.01(1) defines a remotely piloted aircraft (RPA) as "a navigable aircraft, other than a balloon, rocket or kite that is operated by a pilot who is not on board."

When an RPA is not navigated horizontally and is tethered to the ground, it no longer meets the definition of an RPA, and the regulatory requirements contained in Part IX of the CARs no longer apply; instead, operators of tethered objects must meet the obstruction requirements of CAR Standard 621 Chapter 11.

This interpretation recognizes that RPAs that are prevented from being navigated along a path pose a different set of hazards from RPAs that are free-flying. If the RPA is being manoeuvred or the navigation is controlled while the RPA is on the tether, it is navigable and it once again meets the definition of an RPA, and Part IX of the CARs will apply. Control-line flying models are not designed to be navigated and do not meet the definition of an RPA.

A tether can be used to extend the flight time of the RPA by supplying power from the ground. A tether can also be used as a means to mitigate the risk of the flyaway by physically restricting the RPA from reaching certain locations. A tether should not be used as a means to circumvent or exempt an operation from the safety requirements of Part IX.

As an example:

(a) An RPA tethered to the ground by a power cable hovering at a specific location without pilot input while it serves to boost a communication signal does not meet the definition of an RPA.

(b) An RPA attached to a line while it is being manoeuvred or navigated by a pilot does meet the definition of an RPA, and CARs Part IX provisions governing small RPAs apply.

(c) A tether should not be used for the sole purpose of exclusion from the safety requirements of Part IX. Tethered RPAs should comply with the requirements of Part IX that are applicable to the type of operation being performed.

The addition of a tether to an RPA is considered a modification to an RPAS. Therefore, if an RPAS safety assurance declaration has been made under CAR section 901.194 for advanced operations, the installation of a tether on the RPA will invalidate this RPAS safety assurance declaration unless:

(a) the modification was performed according to the instructions from the manufacturer of the part or equipment used to modify the system (CAR 901.70(b)); and

(b) the pilot installing the tether on the RPA is able to demonstrate that the system continues to meet the technical requirements set out in Standard 922—*RPAS Safety Assurance* that are applicable to the operations referred to in subsection 901.69(1) for which the declaration was made (CAR 901.70(a)).

Best practices dictate that tethered RPA operations should not be conducted closer to people than the length of the tether restraining the RPA plus at least 5 m. For example, if the length of the tether is 120 m, a safety margin of more than 125 m from people extending laterally from the point the tether is attached to the ground should be maintained. Moreover, to mitigate significant risk of injuries or damages, sufficient space is to be allocated to allow for post-crash RPA flying debris (e.g., spinning rotor components can be flung a great distance). This is to be taken into account at the planning stage and confirmed during the site survey.

3.2.39 NOTAM

3.2.39.1 General

A NOTAM is a notice to airman that contains information concerning the establishment or condition of, or any changes in, any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel involved in flight operations. A NOTAM is originated and issued promptly whenever the information to be distributed is of a temporary nature and of short duration, or when operationally significant permanent changes or temporary changes of long duration are made at short notice. NOTAMs can be used to advertise changes to the information on aeronautical charts or in aeronautical information publications. For more information on NOTAMs, see part MAP 3.0 of this document.

3.2.39.2 RPAS NOTAM

RPAS operations in compliance with the CARs or to an SFOC—RPAS should result in safe operations and, therefore, a NOTAM for RPAS operation should not normally be required.

The need to publish a NOTAM is determined by TC in conjunction with NAV CANADA air traffic services and not left to the discretion of the RPA pilot or negotiated between the aerodrome operator, the RPA pilot or other parties. When TC directs the RPA pilot to originate the RPAS NOTAM, either an SFOC—RPAS number or the directing TC inspector's name must be included in the NOTAM request.

3.3 Basic Operations

3.3.1 General

Basic operations require small RPA pilots to have the necessary qualifications and skills.

Basic operations are for those intending to operate an RPA:

(a) in uncontrolled airspace (CAR 901.14);

(b) at a distance of 100 ft (30 m) or more from another person except from a crew member or other person involved in the operation (CAR 901.26);

(c) at a distance of three nautical miles (5.6 km) or more from the centre of an airport or one nautical mile (1.8 km) or more from the centre of a heliport (CAR 901.47).

For more information, refer to 3.2.35 Operations at or in the Vicinity of an Aerodrome, Airport, or Heliport.

Pilots carrying out basic RPA operations without a pilot certificate—small remotely piloted aircraft (for basic or advanced operations) may be subject to individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.3.2 Pilot Requirements

3.3.2.1 Remotely Piloted Aircraft (RPA) Pilot Certificate

A pilot certificate—small RPA (VLOS)—basic operations is issued by the Minister to those that are at least 14 years of age and have successfully completed the RPAS Basic Operations examination (CARs 901.54, 901.55). The RPAS 101 guide has been developed in cooperation with TC and the Aerial Evolution Association of Canada (AEAC) to provide general knowledge to Canadian RPA pilots: <https://www.aerialevolution.ca/wp-content/uploads/2022/02/Nov-27-RPAS-101_EN-Final.pdf>.

A person of less than 14 years of age may conduct basic operations if they are under the direct supervision of the holder of a basic or advanced RPA pilot certificate (CAR 901.54(2)).

3.3.2.2 Recency Requirements

Holders of the basic or advanced small RPA (VLOS) pilot certificate must keep up their skills and knowledge by showing that they have met the recency requirements within the last 24 months (section 921.04 of CAR Standard 921). This involves being issued a basic or advanced small RPA (VLOS) pilot certificate (CAR 901.55 or 901.64) or successfully completing a flight review (CAR 901.64(c)) or recurrent training activities (section 921.04 of CAR Standard 921), including attendance at a safety seminar or completion of a self-paced study program endorsed by TCCA or of an advanced RPAS recurrent training program that includes human factors, environmental factors, route planning, operations near aerodromes/airports, and applicable regulations, rules, and procedures. Certificate holders can rewrite either RPAS exam to accomplish the recency requirements, regardless of which certificate they have (advanced RPA pilot certificate holders can write and pass the RPAS Basic Operations exam to accomplish the recency requirements).

The self-paced study program endorsed by TCCA is available on the TC drone safety Web site: <https://tc.canada.ca/en/aviation/drone-safety/getting-drone-pilot-certificate/remotely-piloted-aircraft-system-rpas-recency-requirements-self-paced-study-program>. The completed copy shall be retained by the pilot and be easily accessible to them during the operation of an RPAS. The completed copy does not need to be sent to TC.

RPA pilots who fail to maintain recency but continue to operate their RPA may receive individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.3.2.3 Access to Certificate and Proof of Currency

When operating an RPAS, the pilot must be able to easily access both their basic or advanced RPA pilot certificate (CAR 901.55 and 901.64) and documentation demonstrating recency (CAR 901.56).

RPA pilots failing to demonstrate recency may receive individual penalties of up to $1,000 and/or corporate penalties of up to $5,000.

3.3.2.4 Examination Rules

It is not permitted to copy or remove all or any portion of the RPAS examination, to help or accept help from any person during the examination, or to complete any portion of the examination on behalf of any other person (CAR 901.58). If a person fails the examination or flight review they must wait at least 24 hours before a retake (CAR 901.59).

3.3.3 Small Remote Pilot Aircraft (RPA) Requirement

No RPA manufacturer declaration is needed for basic operations but the RPA needs to be operated in accordance with the manufacturer's instructions (CAR 901.31). The small RPA must have an issued registration number issued that is clearly visible on the remotely piloted aircraft (CAR 900.13 and 900.14).

3.4 ADVANCED AND LEVEL 1 COMPLEX OPERATIONS

3.4.1 General — Advanced Operations

3.4.1.1 Application

Advanced operations are for pilots with advanced pilot certification intending to operate an RPAS, as per CARs sections 901.62 and 901.69:

(a) operation of a small RPA in VLOS:

(i) in controlled airspace,

(ii) at a distance of less than 100 ft (30 m), but not less than 16.4 ft (5 m), measured horizontally and at any altitude, from any person not involved in the operation,

(iii) at a distance of less than 16.4 ft (5 m), measured horizontally and at any altitude, from any person not involved in the operation, or

(iv) within 3 NM (5.6 km) from the centre of an airport or within 1 NM (1.9 km) from the centre of a heliport;

(b) the operation of a small RPA to conduct an extended VLOS operation in uncontrolled airspace;

(c) the operation of a small RPA to conduct a sheltered operation;

(d) the operation of a medium RPA to conduct a VLOS operation:

(i) in uncontrolled airspace and at a distance of 500 ft (152.4 m) or more, measured horizontally and at any altitude, from any person not involved in the operation;

(ii) the operation of a medium RPA to conduct a VLOS operation in uncontrolled airspace and at a distance of less than 500 ft (152.4 m) but not less than 100 ft (30 m), measured horizontally and at any altitude, from any person not involved in the operation;

(iii) the operation of a medium RPA to conduct a VLOS operation at a distance of less than 100 ft (30 m), measured horizontally and at any altitude, from any person not involved in the operation;

(iv) the operation of a medium RPA to conduct a VLOS operation in controlled airspace.

RPA pilots require the necessary qualifications and skills, are required to adhere to established procedures of airports and heliports (CARs section 901.73) and operate an RPA with a SAD for the type of operations and distances from people (CARs section 901.194) in accordance with permitted operation, as per CARs section 901.69.

TC can issue an SFOC—RPAS for specific operations under special conditions. For more information, look at subpart 3.6 of this chapter and the SFOC—RPAS Web site: <https://tc.canada.ca/en/aviation/drone-safety/drone-pilot-licensing/get-permission-special-drone-operations>.

3.4.1.2 Advanced Operations at or in the Vicinity of an Airport or Heliport

Advanced operations involving small RPA or medium RPA may be conducted in the vicinity of a certified aerodrome, within 3 NM (5.6 km) of the center an airport, water airport or within 1 NM (1.9 km) of the center of a heliport, provided the RPA operation:

(a) is conducted in accordance with the established procedure with respect to the safe use of RPA that is applicable to that airport or heliport, as required under CARs section 901.73; and

(b) complies with all CARs requirements, including requirements for advanced operations under Division V of Part IX of the CARs.

Please refer to the NRC drone site selection tool 2 at <https://nrc.canada.ca/en/drone-tool/>, the NAV Drone Viewer at <https://map.navdrone.ca/>, the CFS, the CWAS or VNCs for more information and the location of an airport, heliport or water airport at or in the vicinity of an RPAS operation.

3.4.1.3 Established Procedure for Operations at or in the Vicinity of an Airport or Heliport

If a procedure is established for advanced operations at or in the vicinity of a certified airport, heliport or water aerodrome, it is published in the PRO section of the current CFS, or in the current CWAS for water airports. Procedures may also be provided in an RPA Flight Authorization Notice issued by a provider of air traffic services in the area of operation.

Below is the TC generic established procedure that shall be followed by RPA pilots when operating in an advanced environment at or in the vicinity of an airport, heliport or water airport pilot when there is no one published or provided:

(a) Always give way to traditional aircraft and keep the RPA within VLOS (CARs sections 901.11, 901.17 and 901.18). See subsection 3.2.1.1 of this chapter for information about VLOS and section 3.2.5 about right of way.

(b) Ensure that you have a pilot certificate—RPA—advanced operations.

(c) Adhere to the CARs and respect the limits of the privileges granted by the TC advanced RPA pilot certificate with regards to Part IX.

(d) Prior to an advanced RPAS operation and as part of the site survey required by CARs section 901.27, consult the CFS, CWAS, VFR charts, Drone Site Selection Tool or NAV Drone Viewer to research the airport, heliport or water airport where operations are to be conducted so that you understand the relevant information.

(e) When operating an RPA at or in the vicinity of an aerodrome, water aerodrome, airport or heliport, the RPA pilot should contact the aerodrome operator to inform them of the RPAS operation, regardless of whether the RPA is operated in controlled or uncontrolled airspace.

(f) The RPA pilot should maintain a listening watch of the applicable aerodrome traffic frequency found in the CFS or on VNCs. Any person operating a VHF radio must hold an ROC-A. TC AIM COM 1.0, NAV CANADA's *VFR Phraseology Guide*, and ISED's study guide RIC-21 for the ROC-A provide additional information on radiotelephony procedures.

If you choose to operate your RPA in one of these areas and see traditional aircraft operating, it is recommended to land the RPA and reassess the situation. If you notice regular aircraft activity at a location, it is recommended to contact the airport operator to better understand the local traffic circuit procedures and to coordinate your RPA operations.

NOTES:
Aerodrome, water aerodrome, airport and heliport operators don't have access to NAV Drone RPA flight authorization confidential information.

Although aerodrome operators can prohibit someone from using their lands, they cannot forbid or impose conditions on the use of the airspace surrounding an aerodrome, airport or heliport. Airspace access is regulated through the CARs, and any aircraft and pilot meeting the requirements therein could operate the airspace. Under section 5.1 of the *Aeronautics Act*, only the Minister or delegate can restrict access to airspace: <https://laws.justice.gc.ca/eng/acts/A-2/page-4.html>.

3.4.1.4 Declaration — Permitted Advanced Operations

As per CARs section 901.69, to conduct any of the following advanced operations, a RPAS SAD or PVD must have been made in accordance with CARs section 901.194 in respect of that model of RPAS and in respect of each of the technical requirements set out in CARs Standard 922 that is applicable to advanced RPAS operation:

(a) the VLOS operation of a small RPA in controlled airspace (CARs 922.04);

(b) the VLOS operation of a small RPA at a distance of less than 100 ft (30 m) but not less than 16.4 ft (5 m), measured horizontally and at any altitude, from any person not involved in the operation (CARs 922.05);

(c) the VLOS operation of a small RPA at a distance of less than 16.4 ft (5 m), measured horizontally and at any altitude, from any person not involved in the operation (CARs 922.06);

(d) the operation of a small RPA to conduct a sheltered operation in controlled airspace (CARs 922.04);

(e) the VLOS operation of a medium RPA at a distance of 500 ft (152.4 m) or more, measured horizontally and at any altitude, from any person not involved in the operation (CARs 922.08);

(f) the VLOS operation of a medium RPA at a distance of less than 500 ft (152.4 m) but not less than 100 ft (30 m), measured horizontally and at any altitude, from any person not involved in the operation (CARs 922.07);

(g) the VLOS operation of a medium RPA at a distance of less than 100 ft (30 m), measured horizontally and at any altitude, from any person not involved in the operation (CARs 922.07); or

(h) the VLOS operation of a medium RPA in controlled airspace (CARs 922.04 and 922.08).

NOTE:
For more information on SADs and PVDs, refer to subsection 3.4.4.1 of this current chapter.

RPA pilots carrying out advanced operations without the advanced RPA pilot certificate or without the necessary RPAS SADs may receive individual penalties of up to $1,000 and/or corporate penalties of up to $5,000 per violation.

3.4.1.5 Eligible RPAS for Advanced Operations

You may only use RPAS that meet the safety assurance requirements outlined in CARs Standard 922 for advanced operations described in CARs section 901.69 in accordance with CARs section 901.24, you must visit the Drone Safety Web site at <https://tc.canada.ca/en/aviation/drone-safety/learn-rules-you-fly-your-drone/choosing-right-drone-advanced-operations> for information on selecting an RPAS approved for the intended operation, before conducting advanced operations listed in CARs section 901.69.

NOTES:
A small RPA without CARs Standard 922 RPAS SAD can only be operated in uncontrolled airspace when:

- more than 100 ft of any person not part of the operation,
- less than 3 NM (5.6 km) from the center of an airport,
- less than 1 NM (1.9 km) from the center of a heliport,
- in sheltered operations, and
- in extended VLOS operations.

A medium RPA without a SAD can't be operated in Canada. TC does not issue SFOC–RPAS in order to operate an RPAS without a SAD. In accordance with Standard 922, the only solution to be able to use a medium RPA in Canada is for a person to make a relevant SAD, with the guidance information from AC 922-001 and AC 901-001.

More information on the RPAS safety assurance declaration can be found in section 3.4.4 of this chapter and on TC's Web site at <https://tc.canada.ca/en/aviation/drone-safety/submitting-drone-safety-assurance-declaration>.

3.4.1.6 Advanced Operations in Controlled Airspace

Operations in controlled airspace are advanced operations. Pilots must have an advanced RPA pilot certificate (CAR 901.64) and must use an RPAS that has been declared for the relevant operation (CAR 901.69). The declaration states that the RPA has the required positional accuracy of at least +/- 10 m laterally and +/- 16 m altitude. The required accuracy for operations within controlled airspace is identified for purposes of communication with other users of the airspace (e.g., the control tower) in order to provide a minimum confidence related to the altitude and position reports from an RPA pilot (CAR Standard 922.04). This eligibility is stipulated in Standard 922.04.

This CARs Standard 922.04 eligibility is not written on the RPA certificate of registration but is available on the Drone Safety Web site at <https://tc.canada.ca/en/aviation/drone-safety/learn-rules-you-fly-your-drone/choosing-right-drone-advanced-operations>. RPAS operated outside of the manufacturer's operational limitations (including but not limited to wind, temperature or other operational limits and minimums) are not considered to be within the declared capabilities of the RPAS and are not safe for flight (CAR 901.31).

The RPA pilot must communicate with the ANSP in the area of operations in advance of the operations. A pilot may not operate an RPA in controlled airspace unless he or she has received a written RPAS Flight Authorization from the ANSP (CAR 901.71(1)). The pilot must then comply with all instructions given by the ANSP (901.72).

An RPA flight authorization can be completed and obtained using NAV Drone, NAV CANADA's drone flight planning tool. More information is available at <https://www.navcanada.ca/en/flight-planning/drone-flight-planning.aspx>.

The following information is required:

(a) the date, time and duration of the operation;

(b) the category, registration number and physical characteristics of the aircraft;

(c) the vertical and horizontal boundaries of the area of operation;

(d) the name, contact information and pilot certificate number of any pilot of the aircraft;

(e) the procedures and flight profiles to be followed in the case of a lost command and control link;

(f) the procedures to be followed in emergency situations;

(g) the process and the time required to terminate the operation; and

(h) any other information required by the ANSP that is necessary for the provision of air traffic management.

NOTES:
There is no requirement to hold an SFOC—RPAS for operations over 400 ft AGL in controlled airspace. As per CAR 901.71(2), an authorization above 400 ft AGL in the controlled airspace needs to be issued by the ANSP of the area of operation. This is subject to all other CARs provisions being met.

RPA pilots operating an RPA in controlled airspace without an authorization issued by the provider of air traffic services in the area of operation and without this authorization being easily accessible to the pilot during the operation may receive individual penalties of up to $1,000 and/or corporate penalties of up to $5,000 per violation.

3.4.2 General — Level 1 Complex Operations

3.4.2.1 Application

Before conducting level 1 complex operations, the pilot must:

(a) fly under the authority of an RPOC and must as per CARs section 901.88:

  (i) be an RPAS operator or an employee, an agent or mandatary or a representative of an RPAS operator; and

  (ii) comply with the conditions in the RPOC issued to the RPAS operator.

(b) hold a Pilot Certificate – Level 1 Complex Operations and follow CARs section 901.91 recency requirements, and

(c) operate a registered and marked small or medium RPA holding a valid Standard 922 RPAS SAD for level 1 complex operations in accordance with CARs section 901.95 (small or medium RPA with 901.87(a) SAD, or small RPA with 901.87(b) PVD).

3.4.2.2 Eligible RPAS for Level 1 Complex Operations

You may only use RPAS that meet the SADs outlined in CARs Standard 922 for level 1 complex operations described in CARs section 901.87.

In accordance with CARs section 901.24, you must visit the Drone Safety Web site at <https://tc.canada.ca/en/aviation/drone-safety/learn-rules-you-fly-your-drone/choosing-right-drone-advanced-operations> for information on selecting an RPAS approved for the intended operation, before conducting any of these level 1 complex operations.

In accordance with section 901.87, level 1 complex operations include:

(a) the operation of a small RPA or a medium RPA holding a SAD, to conduct a BVLOS operation in uncontrolled airspace and not less than 1 km from a populated area; and

(b) the operation of a small RPA holding a PVD to conduct a BVLOS operation in uncontrolled airspace over a sparsely populated area or at less than 1 km from a populated area.

More information on the RPAS SAD can be found in section 3.4.4 of this chapter and on TC's Web site at <https://tc.canada.ca/en/aviation/drone-safety/submitting-drone-safety-assurance-declaration>.

3.4.2.3 Level 1 Complex Operations

Before commencing a level 1 complex operations, the pilot shall:

(a) operate the RPA in uncontrolled airspace only as per CARs section 901.87,

(b) operate the RPA at 400 ft AGL or below as per CARs section 901.25,

(c) operate the RPA more than 5 NM (9.3 km) from the center of aerodromes listed in the CFS or the CWAS as per CARs section 901.47,

(d) be familiar with the information relevant to the intended flight as per section 901.24, including:

(i) the results of the site survey conducted under CARs section 901.27, and more particularly CARs paragraph 901.27(h): the distance from any populated area or sparsely populated area,

(ii) any safety assurance declaration referred to in CARs section 901.194 made in respect of the model of RPAS to be used for the level 1 complex BVLOS operation flight, and

(iii) the qualifications of all crew members.

(e) ensure the RPAS operator's RPAS operations manual is immediately available to crew members, as per CARs section 901.30,

(f) the ground visibility is not less than 3 NM, and the aircraft is operated clear of cloud, as per CARs section 901.34, and

(g) the aircraft shall be equipped with anti-collision lights, and those lights are turned on, as per CARs subsection 901.38.1.

TC may issue an SFOC–RPAS for specific operations under special conditions. For more information, refer to section 3.6 of this document and visit the SFOC–RPAS Web site: <https://tc.canada.ca/en/aviation/drone-safety/drone-pilot-licensing/get-permission-special-drone-operations>.

3.4.3 Advanced and Level 1 Complex RPA Pilot Certification Requirements

3.4.3.1 Advanced RPA Pilot Certificate

A pilot certificate—RPA—advanced operations is issued by the Minister to pilots who have demonstrated that they are at least 16 years of age and have successfully completed the RPAS Advanced Operations examination and flight review (CARs subsection 901.64(c)). The RPAS 101 guide has been developed in cooperation with TC and AEAC to provide general knowledge to Canadian RPA pilots for basic and advanced operations: <https://www.aerialevolution.ca/rpas101/>.

A person younger than 16 years of age or without the required certification may conduct advanced operations if they are under the direct supervision of the holder of an advanced RPA pilot certificate (CARs subsection 901.63(2)). A person operating an RPAS as part of a flight review is exempt from the requirement to hold an advanced pilot certificate.

Please note that since April 1, 2025, a foreign pilot is no longer required to hold an SFOC–RPAS for a flight review, if they are using a Canadian registered RPA. An SFOC–RPAS is required for a foreign-owned RPA to comply with CARs 900.13 registration requirements. The foreign pilot must comply with all applicable regulations and obtain a Canadian RPA pilot certificate. For more information, look at the foreign pilot or operator SFOC Web site: <https://tc.canada.ca/en/aviation/drone-safety/drone-pilot-licensing/get-permission-special-drone-operations/get-permission-fly-drone-foreign-pilot-operator>.

3.4.3.2 Level 1 Complex RPA Pilot Certificate

A pilot certificate—RPA—Level 1 Complex operations is issued by the Minister under CARs section 901.90 to pilots who have demonstrated:

(a) that they are at least 18 years of age,

(b) have successfully completed the RPAS Advanced Operations examination,

(c) have completed 20 hours of RPAS ground school instruction delivered by a training provider covering the subjects set out in TP 15530 document,

(d) after completion of the instruction referred to in paragraph (c), successfully completed the examination "Remotely Piloted Aircraft Systems — Level 1 Complex Operations," and

(e) within 12 months before the application of the certificate, have successfully completed a flight review.

A person younger than 18 years of age or without the required certification may conduct level 1 complex operations if they are under the direct supervision of the holder of a level 1 complex RPA pilot certificate as per CARs subsection 901.89(2). This is applicable for the flight review of the level 1 complex pilot certificate.

3.4.3.3 Recency Requirements

The holder of an RPA pilot certificate must keep up their skills and knowledge by showing that they have met the recency requirements (CARs sections 901.56, 901.65 and 901.91) within the previous 24 months.

An RPA pilot who participates in any of the following activities is considered to have met recurrent training requirements:

(a) attendance at a safety seminar endorsed by TCCA;

(b) completion of an RPAS recurrent training program designed to update RPA pilot knowledge, which includes, human factors, environmental factors, route planning, operations near aerodromes/airports, and applicable regulations, rules and procedures; or,

(c) completion of a TC endorsed self-paced study program, which is designed to update RPA pilot knowledge in the subjects specified in paragraph (b).

RPA pilot certificate holders can write or re-write and pass any RPAS pilot exam, excluding the Flight Reviewer exam, to accomplish the recency requirements, regardless of which certificate they have (advanced or level 1 complex RPA pilot certificate holders can also write and pass the basic, advanced or level 1 complex exam to accomplish the recency requirements).

Failure of any of the exams attempted for recency purposes will not meet recency requirements, but they will also not invalidate and existing pilot certificate that is otherwise valid.

The self-paced study program endorsed by TCCA is available on the TC drone safety Web site: <https://tc.canada.ca/en/aviation/drone-safety/drone-pilot-licensing/drone-pilot-study-resources/recency-requirements-self-paced-study-program>. The completed copy shall be retained by the pilot and be easily accessible to them during the operation of an RPAS. The completed copy does not need to be sent to TC.

RPA pilots who fail to maintain recency but continue to operate their RPA may receive individual penalties of up to $1,000 and/or corporate penalties of up to $5,000 per violation.

3.4.3.4 Access to Certificate and Proof of Currency

When operating an RPAS, the pilot must be able to easily access both their RPA pilot certificate (CARs section 901.55, 901.64 or 901.90) and documentation demonstrating recency (CARs section 901.56, 901.65 or 901.91).

RPA pilots failing to demonstrate recency (CARs section 901.57, 901.66 or 901.92) may be subject to individual penalties of up to $1,000 and/or corporate penalties of up to $5,000 per violation.

3.4.3.5 Examination Rules

It is not permitted to copy or remove all or any portion of the RPAS examination, to help or accept help from any person during the examination, or to complete any portion of the examination on behalf of any other person (CARs sections 901.58, 901.67 or 901.93). If a person fails the examination or flight review, they must wait at least 24 hours before a retake (CARs section 901.59, 901.68 or 901.94).

3.4.4 RPAS Safety Assurance Declaration

3.4.4.1 General

Advanced and Level 1 Complex operations of a small RPA or medium RPA require that the Declarant or Declaring Entity provides the Minister a safety assurance declaration (section 901.194) stating that the RPAS is intended for these operations (sections 901.69 and 901.87), has all necessary documentation and meets the technical requirements set out in Standard 922—*RPAS Safety Assurance*.

Table 3.1 RPAS Declarations – Summary

Small/Medium RPA Operations		Small RPA (250 g to 25 kg)	Medium RPA (above 25 kg to 150 kg)
VLOS operations	**Uncontrolled airspace** **More than 100 ft / 500 ft** from any person not part of the operation	No Declaration required Basic Operations	**922.08(1,2) Declaration for 901.69(e)**
	Controlled Airspace	**922.04 Declaration for 901.69(a)**	**922.04 + 922.08(1,2) Declarations for 901.69(h)**
	Less than 100 ft / 500 ft, but more than 16.4 ft / 100 ft from any person not part of the operation	**922.05 Declaration for 901.69(b)**	**922.07 Pre-Validated Declaration (PVD) for 901.69 (f)**
	Less than 16.4 ft / 100 ft from any person	**922.06 Declaration for 901.69(c)**	**922.07 PVD for 901.69(g)**
Sheltered Operation	**Sheltered Operation in Controlled Airspace** more than 100 ft from any person not part of operation	**Declaration for 901.69 (d) 922.04**	**Not Permitted under CARs Part IX**
BVLOS operations	**More than 1 km from populated areas** (more than 5 ppl/sq km)	**922 Declarations for 901.87(a)** **922.08(1,2) 922.09 922.10* 922.11**	**922 Declarations for 901.87(a)** **922.08(3,4,5,6) 922.09 922.10* 922.11**
	Less than 1 km from populated areas (more than 5 ppl/sq km) and over sparsely populated areas (5 to 25 ppl/sq km)	**922 PVD for 901.87(b)** **922.07 922.09 922.10* 922.11 922.12**	**Not Permitted under CARs Part IX**

The Declarant does not need to submit the results of their design verification tests with the declaration but must be able to provide them if requested by TC. While the declarant is responsible for ensuring the RPAS continues to meet safety requirements, pilots must always operate within the RPAS manufacturer's stated limitations.

The model RPAS safety assurance declarant is not necessarily the original manufacturer. When an RPAS Declarant is not the manufacturer of the complete RPAS, it may be more difficult to have complete configuration control over all parts of the RPAS. This might be the situation for declarants who are declaring for a modification (i.e., an after-market parachute system), or provision of a service (i.e., DAA or C2 as a service). Ideally, the RPAS Declarant will have a relationship with the original equipment manufacturer to support their declaration. This could take the form of API documentation when developing add-on systems for the RPAS, or detailed specifications and tolerances that allow the applicant to understand any variations that might be present in the original RPAS. In these cases, the declarant should carefully consider what aspects of the RPAS need to be configured to support their declaration. For example, if the declaration relies on certain firmware versions, or certain operational limitations of the RPAS, then these need to be communicated clearly to the operator. In cases where a relationship with the original equipment manufacturer is not possible, it is the responsibility of the RPAS Declarant to perform any tests and analyses required to ensure that the final RPAS as declared (i.e., including their service or modification) meets the declared 922 standards.

As per section 901.24(b), RPA pilots must always ensure, before commencing a flight, that their RPAS has a valid and appropriate safety assurance declaration before conducting Advanced or Level 1 Complex operations. RPAS operated outside of the manufacturer's instructions (including but not limited to wind, temperature, centre of gravity, or other operational limits and minimums) are not considered to be within the declared capabilities of the RPAS and are not safe for flight (section 901.31) and may be subject to individual penalties of $1,000 and/or corporate penalties of $5,000 per violation.

Some operations require a higher level of safety assurance. Level 1 Complex operations have a higher level of risk and require the Declarant to apply for a PVD. This process involves a review of how the RPAS or configurable element complies with the applicable Standard 922 requirements before making a safety assurance declaration. Once the manufacturer has shown that they have the resources and ability to design a safe RPAS, TC issues a Letter of Acceptance for that model, allowing the manufacturer to make a declaration. A PVD also requires manufacturers to submit annual safety reports to TC and collect service difficulty reports from operators. A PVD can cover the RPAS, specific components that expand operational capabilities (e.g., parachutes, DAA, C2, etc.) or the entire RPAS with all associated configurable elements. Pilots are responsible for ensuring that either their RPAS is declared for all the applicable Standard 922 requirements, or that a combination of RPA and other configurable elements, when put together, have all the necessary declarations.

AC 901-001 provides further information on how to submit safety assurance declarations and apply for a PVD. AC 922-001 provides one means (but not the only means) of compliance with the technical requirements in Standard 922. These ACs are good starting points for manufacturers to start their due diligence with respect to compliance, and for pilots to understand the level of safety expected of the product. It is expected that entities making declarations have, or have access to, the necessary technical expertise to make valid judgements regarding compliance with the applicable Standard 922 requirements.

The person submitting an RPAS safety assurance declaration must notify the Minister of any change in the name, legal name, address and contact information referred to in paragraph 901.194(2)(a) within 30 days after the change. Paragraph 901.194(7) provides that persons who fail to notify the Minister of any of the listed changes are subject to individual penalties of $1,000 and/or corporate penalties of $5,000 per violation.

Anyone that makes an RPAS safety assurance declaration or a PVD on behalf of the original manufacturer or a Declarant takes on the responsibilities associated with the declaration. Declarants failing to maintain or demonstrate adherence to CAR requirements are subject to individual penalties of $3,000 and/or corporate penalties of $15,000 per violation.

3.4.4.2 Modifications of RPAS with Safety Assurance Declaration

Modifications to an RPAS that holds a safety assurance declaration, including the addition of add-on equipment, should be made in accordance with the manufacturer's recommendations. The integration of third-party add-on equipment, changes to an RPA structure or electrical systems (hardware and software), or any other changes that are not within the manufacturer's specifications may constitute a modification to an RPAS. If a modification affects the means of compliance with Standard 922 requirements or adds additional operating capabilities, a new safety assurance declaration may be required.

Modifications that do not impact the original RPAS safety assurance declaration and thus do not alter the declared capabilities of the RPAS do not require a new declaration as required per section 901.70. An RPAS must still be operated within the operating limits as defined by the RPAS manufacturer (section 901.31) who made the safety assurance declaration.

For RPAS with a PVD and Letter of Acceptance from TC are required to specify what modifications can be made and by whom. Pilots of these systems must follow manufacturer specifications and are encouraged to work directly with the original equipment manufacturer to determine what is required to make a modification.

It is the responsibility of the party making the modification or adding equipment to evaluate whether there is an effect on the declared capabilities of that RPAS and that the RPAS remains within the published specifications from the manufacturer. Modifiers should evaluate how the modification or add-on equipment can be integrated safely with existing systems and

does not introduce new failure conditions not accounted for in the original design by the manufacturer.

If the modification can affect the declared capabilities of the original RPAS, or the party making the modification does not possess the technical information on the original design to properly conduct the evaluation, the RPAS safety assurance declaration is invalidated and the small RPA is limited to operations in basic environments only, unless a new safety assurance declaration is made. According to section 901.96, it is illegal to operate a medium RPA without a valid RPAS safety assurance declaration. A modifier that makes a declaration for a modified RPAS takes on the same regulatory responsibilities as the initial RPAS Declarant. AC 922-001—RPAS Safety Assurance serves as guidance to the considerations that should be made for parties making safety assurance declarations.

3.4.4.3 Small RPA and Medium RPA — Operations in Controlled Airspace

Operations of small or medium RPA in controlled airspace are advanced operations. Pilots must have as a minimum an advanced RPA pilot certificate and operate an RPAS, or combination of RPA and configurable element(s) that are declared for:

- Standard 922.04 – Controlled Airspace (all 250 g and above RPA)
- Standard 922.08 (1, 2) – Containment (medium RPA only)

The declaration for Standard 922.04 assures that the RPA has the required positional accuracy of at least +/- 10 m laterally and +/- 16 m vertically. These accuracy requirements are used for the purpose of communication with other users of the airspace (e.g., air traffic control services) to provide a minimum level of confidence related to the altitude and position reports from an RPA pilot (Standard 922.04).

A declaration for Standard 922.08 is only required for medium RPA operating in controlled airspace. The RPA and any associated configurable elements are required to meet the low robustness containment requirement. This declaration to Standard 922.08 assures that the RPA can reliably stay within a defined operational volume.

3.4.4.4 Small RPA — VLOS Operations Less Than 100 ft But More Than 16.4 ft of Any Person

Operations in VLOS less than 100 ft (30 m) but more than 16.4 ft (5 m) horizontally from any another person not involved in the operation. For these operations, the pilot must have as a minimum an advanced pilot certificate and operate an RPAS, or combination of RPA and configurable element(s) that are declared for:

- Standard 922.05 – Operations Near People*

***NOTE:**
Standard 922.07 requirements supersede Standard 922.05 – an RPAS declared compliant to Standard 922.07 is considered compliant to Standard 922.05.

A safety assurance declaration for Standard 922.05 assures that the probability of a single failure of the RPAS resulting in a severe injury to a person on the ground is remote. RPAS operated outside of the manufacturer's instructions and operational limitations are not considered to be within the declared capabilities of the RPAS and are not safe for flight (section 901.31).

3.4.4.5 Small RPA — VLOS Operations Less Than 16.4 ft of Any Person

Operations in VLOS less than 16.4 ft (5 m) (measured horizontally and at any altitude) from any person not included in the operation. For these operations, pilots must have as a minimum an advanced pilot certificate and operate an RPAS, or combination of RPA and configurable element(s), that are declared for:

- Standard 922.06 – Operations Over People*

***NOTE:**
Standard 922.07 requirements supersede Standard 922.06 – an RPAS declared compliant to Standard 922.07 is considered compliant to Standard 922.06.

A safety assurance declaration for Standard 922.06 assures that no single failure of the RPAS will result in a severe injury to a person on the ground and that any combination of failures of the RPAS which may result in a severe injury to a person on the ground are shown to be remote.

Pilots operating RPA equipped with parachute systems declared for operations over people, or less than 5 m from any person, are responsible for ensuring they have properly registered their RPA to reflect the operating environments afforded by the parachute system, and that the RPA is operated within the instructions and limitations from the manufacturer (including but not limited to altitude, wind, temperature or other operational limits and minimums). For example, if a parachute system manufacturer has identified in the instructions or specifications a minimum safe flight altitude for their parachute to function safely over people, it is the RPA pilot's responsibility to ensure that they abide by this operational limitation and fly above the manufacturer stated altitude minimum. RPAS operated outside of the manufacturer or declarant's operational limitations are not considered to be within the declared capabilities of the RPAS and are not safe for flight (section 901.31) less than 16.4 ft (5 m), measured horizontally and at any altitude, from any person not involved in the operation.

3.4.4.6 Small RPA — BVLOS Operations More Than 1 km From Populated Areas

As per CARs section 901.87(a), BVLOS operations with a small RPA:

(a) in uncontrolled airspace,

(b) more than 5 NM (9.3 km) from the centre of an aerodrome that is listed in the CFS or the CWAS (subsection 901.47(3)), and

(c) outside of populated areas are those over areas with less than 1 km from a populated area with more than 5 people per square km.

For these operations, the pilot must have a Level 1 Complex pilot certificate and operate an RPAS, or combination of RPA and configurable element(s) that are declared for:

- Standard 922.08 (1,2) – Containment
- Standard 922.09 – Command and Control Link Reliability and Lost Link Behaviour
- Standard 922.10 – Detect, Alert and Avoid*
- Standard 922.11 – Control Station Design

***NOTE:**
When an operation is performed in atypical airspace as defined in AC 903-001, or if an operation is performed in accordance with Standard 923 – Vision Based DAA (as per subsection 901.95(2)), then a declaration against Standard 922.10 is not required.

A safety assurance declaration for Standard 922.08 low robustness requirements assures that the RPAS can reliably stay within a defined operational envelope. The declaration to Standard 922.09 assures that the RPA and/or configurable elements allow for a reliable and safe means of communication and control and that lost link behaviour is predictable and safe. The declaration for Standard 922.10 assures that the RPA and/or configurable elements can, where required, detect other air traffic to an appropriate level of reliability and provide for a safe ability to take avoidance action. Finally, the declaration for Standard 922.11 assures that the RPAS has a control station that is designed to clearly and unambiguously provide pilots with the information and controls required for safe flight.

3.4.4.7 Small RPA — BVLOS Operations Over Sparsely Populated Areas or Near Populated Areas

As per CARs subsection 901.87(b), BVLOS operations with a small RPA are only possible:

(a) in uncontrolled airspace,

(b) more than 5 NM (9.3 km) from the centre of an aerodrome that is listed in the CFS or the CWAS (subsection 901.47(3)), and

(c) over sparsely populated areas or near populated areas are those over areas with a population density of more than 5 but less than 25 people per square km, or less than 1 km from a populated area with more than 5 people per square km.

For these operations, the pilot must have a Level 1 Complex pilot certificate and operate an RPAS, or combination of RPA and configurable element(s) that are declared for:

- Standard 922.07 – Safety and Reliability (PVD)
- Standard 922.09 – Command and Control Link Reliability and Lost Link Behaviour (PVD)
- Standard 922.10 – Detect, Alert, and Avoid (PVD)*
- Standard 922.11 – Control Station Design (PVD)
- Standard 922.12 – Demonstrated Environmental Envelope (PVD)

***NOTE:**
When an operation is performed in atypical airspace as defined in AC 903-001, or if an operation is performed in accordance with Standard 923 – Vision Based DAA (as per subsection 901.95(2)), then a declaration against Standard 922.10 is not required.

Before an RPAS and/or configurable elements can be declared to be operated in these operations, the manufacturer(s) must submit a PVD application and be issued a Letter of Acceptance by TC.

Safety assurance declarations for Standard 922.07 assures that the RPAS and/or configurable elements have been designed to be as safe and reliable as practicable for a given notional CONOPS.

The declaration to Standard 922.09 assures that the RPAS and/or configurable elements allow for a reliable means of communication and control and that lost link behaviour is predictable.

The declaration for Standard 922.10 assures that the RPAS and/or configurable elements can, where required, detect other air traffic to an appropriate level of reliability and allow for the RPA and/or pilot to take avoidance action.

The declaration for Standard 922.11 assures that the RPAS has a control station that is designed to clearly and unambiguously provide pilots with the information and controls required for safe flight.

Finally, the declaration for Standard 922.12 assures the RPAS has been tested to demonstrate the envelope, it can be operated safely (including weather, structural loads, ground storage and transportation, and other external factors that can affect safety).

3.4.4.8 Medium RPA — VLOS More than 500 ft From Any Person

Operations in VLOS using a medium RPA are those greater than 500 ft (152.4 m) horizontally from any person not involved in the RPAS operation. For these operations, the pilot must have as a minimum an advanced pilot certificate to operate an RPAS, or combination of RPA and configurable element(s) that are declared for:

- Standard 922.08 (1, 2) – Containment

A safety assurance declaration for Standard 922.08 low robustness requirements assures that the RPA can reliably stay within a defined operational envelope.

3.4.4.9 Medium RPA — VLOS Operations Less Than 500 ft But More Than 100 ft of Any Person

Operations in VLOS using a medium RPA are those less than 500 ft (152.4 m) but more than 100 ft (30 m) horizontally from any person not involved in the RPAS operation. For these operations, the pilot must have as a minimum an advanced pilot certificate and operate an RPAS, or combination of RPA and configurable element(s) that are declared for:

- Standard 922.07 – Safety and Reliability (PVD)

Before an RPAS and/or configurable elements can be operated for these operations, the manufacturer(s) must submit a PVD application and be issued a Letter of Acceptance by TC.

Safety assurance declarations for Standard 922.07 assures that the RPA and/or configurable elements have been designed to be as safe and reliable as practicable for a given notional CONOPS.

3.4.4.10 Medium RPA — VLOS Operations Less than 100 ft of Any Person

Operations in VLOS using a medium RPA at less than 100 ft (30 m) horizontally from any person not involved in the RPAS operation. For these operations, the pilot must hold as a minimum an advanced pilot certificate and operate an RPAS, or combination of RPA and configurable element(s) that are declared for:

- Standard 922.07 – Safety and Reliability (PVD)

Before an RPAS and/or configurable elements can be operated for these operations, the manufacturer(s) must submit a PVD application and be issued a Letter of Acceptance by TC.

Safety assurance declarations for Standard 922.07 assures that the RPA and/or configurable elements have been designed to be as safe and reliable as practicable for a given notional CONOPS.

3.4.4.11 Medium RPA — BVLOS Operations More Than 1 km From Populated Areas

As per CARs section 901.87(a), BVLOS operations with a medium RPA:

(a) in uncontrolled airspace,

(b) more than 5 NM (9.3 km) from the centre of an aerodrome that is listed in the CFS or the CWAS (subsection 901.47(3)), and

(c) in uncontrolled airspace at least 1 km away from populated areas with more than five people per square km.

For these operations, the pilot must have a Level 1 Complex pilot certificate and operate an RPAS, or combination of RPA and configurable element(s) that are declared for:

- Standard 922.08 (3, 4, 5, 6) – Containment
- Standard 922.09 – Command and Control Link Reliability and Lost Link Behaviour
- Standard 922.10 – Detect, Alert and Avoid*
- Standard 922.11 – Control Station Design

NOTE:
When an operation is performed in atypical airspace as defined in AC 903-001, or if an operation is performed in accordance with Standard 923 – Vision Based DAA (as per subsection 901.95(2)), then a declaration against Standard 922.10 is not required.

A safety assurance declaration for Standard 922.08 high robustness requirements assures that the RPA can reliably stay within a defined operational envelope and that the aircraft's electrical and software equipment has been developed to an industry standard or recognized best practice. The declaration to Standard 922.09 assures that the RPA and/or configurable elements allow for a reliable and safe means of communication and control and that lost link behaviour is predictable and safe. The declaration for Standard 922.10 assures that the RPA and/or configurable elements can, where required, detect other air traffic to an appropriate level of reliability and provide for a safe ability to take avoidance action. Finally, the declaration for Standard 922.11 assures that the RPA has a control station that is designed to clearly and unambiguously provide pilots with the information and controls required for safe flight.

3.5 Flight Reviewers

3.5.1 General

The flight review is an in-person, holistic operational assessment of an RPA pilot's skills. Flight reviews are conducted by qualified flight reviewers who have undergone additional TC testing and are monitored closely by both the self-declared RPAS training organization with which they associate and TC. In addition to confirming that advanced operations or level 1 complex operations category applicants have the CARs-required documentation—pre-flight information (CAR 901.24), normal checklists, emergency checklists and site survey (CAR 901.27)—they are also acting to validate the identity and knowledge of the candidate as well as their operational and flight skills.

3.5.2 Pilot Requirements

3.5.2.1 Flight Reviewer Rating

Flight reviewers must meet and maintain several requirements before they are able to qualify as flight reviewers.

As per CAR 901.176, the flight reviewers applicant must demonstrate:

(a) be at least over 18 years of age;

(b) holds a pilot certificate for advanced operations or for level 1 complex operations and meets the recency requirements set out in CAR 901.65 or 901.91, as the case may be;

(c) has held a certificate for advanced operations or for level 1 complex operations for at least six months immediately before the date of application; and

(d) has successfully completed the examination "Remotely Piloted Aircraft Systems — Flight Reviewers" based on the TP 15263.

The applicant must have a good record with respect to aviation, and have no enforcement action against them, past or pending. They are expected to read, understand and comply with the *Flight Reviewer's Guide For Pilots of Remotely Piloted Aircraft Systems 250 g up to and including 150 kg*, Operating within Visual Line-of-Sight (VLOS), Extended Visual Line-of-Sight (EVLOS), Sheltered VLOS or Level 1 Complex BVLOS (TP 15395) and meet the knowledge requirements outlined in *Knowledge Requirements for Pilots of Remotely Piloted Aircraft Systems, 250 g up to and including 150 kg, Basic and Advanced Operations* (TP 15263) and *Knowledge Requirements for Pilots of Remotely Piloted Aircraft Systems – Level 1 Complex Operations (TP 15530)*, as applicable. They must successfully pass the flight reviewer exam.

Additionally, they must be and remain affiliated with a TP 15263

or TP 15530 self-declared RPAS training provider to exercise the privileges of their flight reviewer rating. To conduct advanced operations flight reviews, the reviewer must be affiliated with either a TP 15263 or a TP 15530 self-declared RPAS training provider. To conduct level 1 complex operations flight reviews, the reviewer must be affiliated with a TP 15530 self-declared RPAS training provider.

3.5.2.2 Examination

The flight reviewer exam is available in the Drone Management Portal to advanced or level 1 complex operations pilot certificate holders with more than six months of experience. The examination contains 30 questions, requires a mark of 80% to pass and focuses on both advanced category operations and flight review requirements. Once successful, applicants pay a fee to have the flight reviewer rating added to their pilot certificate.

The flight reviewer exam must only be passed once. A flight reviewer with an advanced pilot certificate does not need to pass the flight reviewer exam again once they receive their level 1 complex operations pilot certificate; the flight reviewer rating will automatically be applicable to the new pilot certificate, and they will be able to conduct flight reviews for level 1 complex operations. An existing flight reviewer with an advanced pilot certificate does not have to wait an additional six months after obtaining their level 1 complex operations pilot certificate to conduct level 1 complex operations flight reviews.

To exercise the privileges of a flight reviewer, the reviewer must be affiliated with at least one TP 15263 or TP 15530 self-declared RPAS training provider, though multiple affiliations are also permitted as long as the flight reviewers and their affiliated training providers can meet their obligations under the CARs.

Only the individual responsible for the training program(s) at an organization can request an affiliation be made; however, either the flight reviewer or the individual responsible for the training program(s) can request an affiliation be removed.

3.5.3 Conduct of Flight Reviews

The flight review is an in-person activity, requiring the flight reviewer and flight review candidate to be physically on-site at the flight review location for the duration of the exercise. The location must be agreed between the candidate and flight reviewer in advance. They can be conducted in controlled or uncontrolled airspace, though the flight review itself is not exempt from complying with Part IX of the CARs. The applicant must be able to meet the requirements to operate the RPA within that airspace with the exception of having the advanced or level 1 complex operations RPA pilot certificate.

Prior to the flight review, the flight reviewer may assign the candidate a realistic advanced or level 1 complex operational type of mission (for planning purposes). This will be used during the ground portion of the flight review to validate the candidate's ability to plan and execute the applicable RPA operation.

Only a small RPA (250 g to 25 kg) or medium RPA (above 25 kg to 150 kg) may be used to conduct a flight review. Standard 921.06(1)(b)(i) states the RPA used for the flight review must be registered and marked under CAR 900.13 and 900.14: <https://tc.canada.ca/en/corporate-services/acts-regulations/list-regulations/canadian-aviation-regulations-sor-96-433/standards/standard-921-remotely-piloted-aircraft>.

The flight review consists of both ground-based and flight assessment items. If any of the eight assessed items are determined to not meet the requirements or if the candidate displays unsafe flying or behaviour, does not complete an appropriate site survey, lacks training or competency, or does not use effective scanning techniques, the flight review is marked a failure. Candidates who have failed flight reviews may reattempt after 24 hours have elapsed.

Following a successful flight review, the flight reviewer shall enter the required information into the Drone Management Portal within 24 hours. The successful candidate will then be automatically notified via e-mail and routed to the Drone Management Portal to pay for the issuance of the advanced RPA pilot certificate.

3.6 Special Flight Operations—Remotely piloted aircraft system

3.6.1 General

Not every operational consideration can be addressed through regulation. This is particularly true in industries where technology is rapidly evolving, such as the RPAS industry.

Subpart 3 of CARs Part IX allows the Minister under article 903.03 to issue an SFOC—RPAS to allow certain operations that are not covered by the Part IX regulation. SFOC—RPAS operations possible under CARs include:

(a) RPA performing at a special aviation event as per 603.01;

(b) foreign commercial air services as per 900.09(2)(b);

(c) registration of an RPA from a foreign pilot or operator as per 900.13;

(d) BVLOS operations of an RPA as per 901.11;

(e) RPA operated outside of Canadian airspace as per 901.13;

(f) operation above 400 ft AGL in uncontrolled airspace as per 901.25;

(g) operation in VLOS of more than five RPAs from a single control station as per 901.40(2);

(h) operation in BVLOS of more than one RPA from a single control station as per 901.40(3)

(i) operation of a small RPA at a special aviation event or an advertised event as per 901.41;

(j) operation with restricted payloads as per 901.43;

(k) RPA with an operating weight greater than 25 kg as per 903.01(a);

(l) operation of an RPA of less than 250 g at an advertised event as per 903.01(b); and

(m) any other operation of a small RPA for which the Minister determines that a SFOC—RPAS is necessary as per 903.01(c).

Since November 4, 2025, new operations are possible under an SFOC—RPAS as per Part IX:

(n) RPA with an operating weight greater than 150 kg as per 903.01(a);

(o) outside the scope of BVLOS, EVLOS or sheltered operations regulations (901.62(b), (c) or 901.87) as per 901.11(2);

(p) BVLOS in controlled airspace as per 901.14;

(q) RPA that carries persons on board as per 901.22;

(r) medium RPA in adverse weather as per 901.34(2);

(s) BVLOS with less than 3 SM of visibility or in cloud as per 901.34(4)(b);

(t) BVLOS less than 5 NM of an aerodrome in the CFS or the CWAS as per 901.47(3); and

(u) any other operation of a small RPA or medium RPA for which the Minister determines that a SFOC—RPAS is necessary as per 903.01(c).

3.6.2 Application for a SFOC-RPAS

Guidance to complete the application form for the issuance of an SFOC—RPAS (Form 24-0109E) <https://wwwapps.tc.gc.ca/Corp-Serv-Gen/5/Forms-Formulaires/search/results?Keywords=&FormNumber=24-0109&TransportationMode=&Format=&ResultView=Submit&=%2c&=&> is available in AC 903-002—*Application Guidelines for an SFOC—RPAS*, available at <https://tc.canada.ca/en/aviation/reference-centre/advisory-circulars/advisory-circular-ac-no-903-002>.

More guidance as well as compliance checklists to complete and provide with the application are available on TC's drone safety Web site at <https://tc.canada.ca/en/aviation/drone-safety/drone-pilot-licensing/get-permission-special-drone-operations>.

The applicant shall submit the information required by section 903.02 of the CARs via the SFOC—RPAS application form (24-0109E). New subsections 903.02(1) to (4) SFOC—RPAS complexity levels were published on November 4, 2025: <https://lois-laws.justice.gc.ca/eng/regulations/SOR-96-433/FullText.html#s-903.02>.

For medium complexity operations SFOC—RPAS applications listed since November 4, 2025 in 903.02(3) and high complexity operations SFOC—RPAS listed in 903.02(4), applicants are to complete an RPAS ORA, as specified in AC 903-001, and are required to submit the SAIL with their SFOC—RPAS application form. Look if AC 903-001—*Remotely Piloted Aircraft Systems Operational Risk Assessment* Appendix D – Standard Scenarios could apply to the proposed higher risk operations.

AC 903-001—*Remotely Piloted Aircraft Systems Operational Risk Assessment* provides information and guidance to manufacturers and operators intending to develop or operate an RPAS for operations in accordance with the requirements of Part IX, Subpart 3 of the CARs.

AC 903-001 is available at <https://tc.canada.ca/en/aviation/reference-centre/advisory-circulars/advisory-circular-ac-no-903-001>.

As per CARs 903.02 and 903.02(6) and (7), the SFOC—RPAS applicant is responsible for submitting all required information to the Minister. This includes along with a duly completed copy of Form 24-0109E and the relevant compliance checklist. For very-low-complexity and low-complexity operations SFOC—RPAS listed in 903.02(1) and (2), the submission must be made at least 30 working days before the proposed operation date. For medium-complexity and higher-complexity operations listed in CARs 903.02(3) and (4), the submission must be made at least 60 working days in advance.

SFOC—RPAS application forms and compliance checklists may be updated by TC from time to time. Applicants must use the most recent and applicable SFOC—RPAS application form and compliance checklists, which are available on the TC drone safety Web site at <https://tc.canada.ca/en/aviation/drone-safety/drone-pilot-licensing/get-permission-special-drone-operations>.

Complete and accepted SFOC applications will be processed in the order they are received. Processing times can be longer depending on the complexity of the RPAS operation and completeness of the application.

NOTE:
Additional information can be requested based on the type of SFOC—RPAS you are applying for and based on the quality of the supporting documentation provided. Delays thus incurred are the sole responsibility of the applicant.

As per CARs 903.02 and 903.02(6) and (7), all requested information and compliance checklists shall be provided at the time the SFOC—RPAS application is submitted. The application will only be deemed accepted once all the information has been received by the TC RPAS Centre of Expertise (RCE) office. Once a complete SFOC—RPAS application is accepted, the applicant will be informed via a TC RCE office email. SFOC—RPAS applications with an expected duration end date of less than 30 working days in the future will not be accepted.

3.6.3 SFOC—RPAS Service Standard and Charges

Issuance of SFOC—RPAS requires reviews from subject matter experts in aviation or in engineering and will have. Since November 4, 2025, new service standards and charges are applicable for the issuance of SFOC—RPAS, as outlined in the table below. Service standards and charges will apply to activity requests whereby the client has successfully met the application criteria. Services outside of TC (like from ISED or NAV CANADA, for example) are beyond our control and may extend the SFOC—RPAS processing times.

NOTE: Service standards and charges in reference to special aviation event SFOCs issued under 603.01 are already in place.

Table 3.1 SFOC–RPAS Service Standard and Charges

Issue an SFOC—RPAS	Service Standard	Charge
Very Low Complexity Operation under 903.02(1)	30 business days of receiving a complete application.	$20.34
Low Complexity Operation under 903.02(2)	30 business days of receiving a complete application.	$76.28
Medium Complexity Operation under 903.02(3)	60 business days of receiving a complete application.	$915.30
High Complexity Operation under 903.02(4)	60 business days of receiving a complete application.	$2,034
*Two or more medium-complexity operations	60 business days of receiving a complete application.	$2,034
Re-issue an SFOC—RPAS with a minor amendment under 903.02(5)	30 business days of receiving a complete application.	$61.02
A special aviation event with 10,000 or fewer spectators blank line under 603.01	20 working days. Actual processing times can vary depending on the complexity and completeness of the request.	$50
A special aviation event with more than 10,000 spectators and 50,000 or fewer spectators blank line under 603.01	20 working days. Actual processing times can vary depending on the complexity and completeness of the request.	$100
A special aviation event with more than 50,000 spectators blank line under 603.01	20 working days. Actual processing times can vary depending on the complexity and completeness of the request.	$250.55

***Note:** If the application includes several operations, the highest complexity level applies. If an application includes two or more medium-complexity operations, the application is deemed a high-complexity operation.

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