Notice of Proposed Amendment

Remotely Piloted Aircraft Systems

Lower-Risk Beyond Visual Line-of Sight

April 2020

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EXECUTIVE SUMMARY

The Remotely Piloted Aircraft Systems (RPAS) industry continues to grow in Canada and RPAS is being used across a number of sectors, such as agriculture, mining, academia, and law enforcement. That being said, the majority of stakeholders have reported that the regulations, or lack thereof, are a barrier to economic growth and as industry and technology continues to grow so does the demand for more complex flights and operations beyond visual line-of-sight (BVLOS). In January 2019, Transport Canada (TC) published new RPAS regulations for operations within visual line of sight (VLOS), and these regulations permit BVLOS operations under low-risk conditions with the issuance of a Special Flight Operations Certificate (SFOC).

Using the internationally recognized Specific Operational Risk Assessment process developed by the Joint Authorities for Rulemaking of Unmanned Systems, the department is proposing a risk-based regulatory approach that has taken into account the overall safety of people on the ground (ground risk) and the users of the airspace (air risk) in order to permit visual line-of-sight operations with larger RPAS, including additional requirements to mitigate potential risks; as well as lower-risk BVLOS operations. In addition to the Strategic Operational Risk Assessment, the department is proposing a regulatory framework that continues to manage and mitigate risks through the 3Ps – the Pilot (more stringent licensing requirements; the Product (manufacturing and maintenance requirements); and the Procedures (airspace and operational risk mitigations). This proposal aims to allow greater flexibility in the use of RPAS for visual line-of-sight operations, while unlocking the potential for beyond visual line-of-sight operations in Canada. Higher risk BVLOS operations will be subject to a separate regulatory process at a later date. As a result, TC is proposing the following amendments:

Lower-risk BVLOS Framework

- 250 g to 25 kg BVLOS operations in Isolated Areas, within 1km of an area with a population of more than 25 people per square kilometer; over an area with a population density of more than 25 people per square kilometer; and, in controlled airspace;
- 25 kg to 150 kg BVLOS operations in Isolated Areas, and within 1km of an area with a population of more than 25 people per square kilometer; and,
- 150 kg to 650 kg BVLOS operations in Isolated Areas with a max altitude of 400 feet above ground level (AGL).

Expansion of the Existing VLOS Framework

- 250 g to 25 kg VLOS in Uncontrolled Airspace above 400 feet AGL;
- 25 kg to 150 kg VLOS in Basic Operations, Near People and Over People (with increased standoff distances), in Controlled Airspace, and over 400 feet AGL Uncontrolled Airspace; and,
- 150 kg to 650 kg VLOS in Basic Operations above 400 feet AGL.

TC is also exploring remote identification requirements that could support aviation security. As the RPAS economic sector continues to evolve, TC is also looking to Canadians for insight regarding the economic framework for RPAS of the future.

The intent of this paper is to initiate rulemaking consultations for lower-risk RPAS operations beyond visual line-of-sight and seek feedback regarding the economic framework. The department is initiating a 60-day consultation period and looking for feedback from stakeholders on these proposed amendments by inviting stakeholders to send their comments to: TC.RPASRegulations-ReglementsSATP.TC@tc.gc.ca.

BACKGROUND

Drones – or remotely piloted aircraft systems – are increasingly being used as an essential tool for businesses, as well as for fun. An environmental scan[1] conducted in April 2019 looked at 15 different Canadian industries, including agriculture and mining, real estate, academia and law enforcement. Nearly half reported having implemented the use of RPAS technology on a regular basis, while 40% reported either widespread or common use across their individual cases. Furthermore, 80% of all of these RPAS end-users reported that regulations, or lack thereof, remain a barrier to economic growth.

In June 2019, Part IX of the *Canadian Aviation Regulations* (CARs) for Remotely Piloted Aircraft Systems came into force to allow operations within visual line-of-sight. These rules introduced a general provision that applies to all RPAS being flown in Canada to prevent operations in a reckless and negligent manner that could endanger aviation safety or that of a person. The regulations further introduced new rules for RPAS that weigh between 250 grams and 25 kilograms and fall under two categories — basic and advanced. The two categories are differentiated by the type of airspace one is flying in and how close the operations are to people. Both categories require the RPAS to be registered and the pilot to have the appropriate RPAS Pilot Certificate (Basic or Advanced).

Allowing operations beyond visual line-of-sight is essential to unlocking more of the economic potential of the RPAS sector in Canada. Industry estimates that the economic potential of BVLOS operations is significant and with the allowance of routine operations an RPAS could cover larger distances, collect more data with fewer deployments than would be required with VLOS operations all at a lower cost than with the use of traditional aircraft. In Canada, there is a unique potential for BVLOS operations in remote and rural areas particularly in economic sectors such as oil and gas and deliveries to remote communities.

Under the existing Part IX regulations, in order to fly an RPAS beyond visual line-of-sight, a pilot or organization must apply for a Special Flight Operations Certificate (SFOC). The department has been pursuing a BVLOS strategy to stimulate innovation in the sector, enable economic opportunity, and provide regulatory predictability. Since July 2019, the department has been issuing SFOCs for lower-risk commercial BVLOS operations with requirements based on the Joint Authorities for Rulemaking on Unmanned Systems (JARUS) Specific Operational Risk Assessment (SORA) process. To date, Transport Canada has allowed BVLOS operations in two categories: isolated areas and atypical airspace, and isolated areas and uncontrolled airspace, with scaled requirements based on the complexity of the BVLOS operation.

Other countries, such as Australia, New Zealand, the United Kingdom, and the United States, have also taken similar approaches to TC's SFOC process. In each of these countries, a pilot or organization wishing to conduct BVLOS operations must obtain the appropriate permit or certification from their respective civil aviation authority. Not unlike the SFOC process, they must also provide a strong safety case which includes a robust risk assessment similar to the SORA. These countries, with the exception of New Zealand, have also only given authorization to commercial pilots for BVLOS operations. In Australia, BVLOS operations have typically been permitted in remote areas away from people and infrastructure. The United Kingdom is currently in the process of allowing more routine BVLOS operations by leveraging evidence from Detect and Avoid (DAA) trials in non-

[1] Avascent – RPAS Environmental Scan (April 2019)

segregated airspace to inform their rulemaking. However, at present, these countries do not routinely permit BVLOS operations, as they are only authorized in specific, restricted cases.

As part of TC's Regulatory Review Initiative (ongoing since 2019), a lack of regulations for BVLOS operations was identified as an irritant by the RPAS industry. In order to address this, and as part of TC's commitment to regulatory modernization, the department has accelerated the development of regulations for lower-risk beyond visual line-of-sight operations.

The regulatory amendments proposed here would be the first of a series of steps towards allowing more routine BVLOS operations. Through this Notice of Proposed Amendment, TC is looking for feedback and insight from industry for their views on the proposed approach, which is designed to be performance- and risk-based. The scope of these amendments will only cover lower risk operations, such as delivering supplies to remote communities, first responder operations, natural resources and wildlife surveys, and infrastructure inspection. These amendments will not address more complex and higher-risk BVLOS operations such as regular door-to-door package delivery in population centers and the carriage of passengers on board RPAS. These operations will be part of future amendments that will take place at a later date.

OBJECTIVE, SCOPE & APPLICATION

The objective of this regulatory package is to enable routine lower-risk beyond visual line-of-sight RPAS operations in Canada without the requirements for a Special Flight Operation Certificate (SFOC). Through this regulatory proposal, the department is leveraging Part IX of the Canadian Aviation Regulations, experiences gained through pilot projects, research & development activities in Canada and abroad, experience from other civil aviation regulators, trials and the issuance of SFOCs for beyond visual line-of-sight operations.

Using the internationally recognized Specific Operational Risk Assessment process developed by the Joint Authorities for Rulemaking of Unmanned Systems, the department is proposing a risk-based approach that has taken into account the overall safety of people on the ground (ground risk) and the users of the airspace (air risk) in order to permit visual line-of-sight operations with larger RPAS, including additional requirements to mitigate potential risks; as well as lower-risk BVLOS operations. In addition to the Strategic Operational Risk Assessment, the department is proposing a regulatory framework that continues to manage and mitigate risks through the 3Ps – the Pilot (more stringent licensing requirements; the Product (manufacturing and maintenance requirements); and the Procedures (airspace and operational risk mitigations). This proposal aims to allow greater flexibility in the use of RPAS for visual line-of-sight operations, while unlocking the potential for beyond visual line-of-sight operations in Canada. Higher risk BVLOS operations will be subject to separate regulatory process at a later date. The proposed amendments are as follows[2]:

[2] Please see page 8 for a visual depiction of the scope.

Lower-risk BVLOS Framework

- 250 g to 25 kg BVLOS operations in Isolated Areas; within 1km of an area with a population of more than 25 people per square kilometer[3]; over an area with a population density of more than 25 people per square kilometer; and, controlled airspace;
- 25 kg to 150 kg BVLOS operations in Isolated Areas, and within 1km of an area with a population of more than 25 people per square kilometer; and,
- 150 kg to 650 kg BVLOS operations in Isolated Areas with a maximum altitude of 400 feet AGL.

Expansion of the Existing VLOS Framework

- 250 g to 25 kg VLOS in Uncontrolled Airspace above 400 feet AGL;
- 25 kg to 150 kg VLOS in Basic Operations, Near & Over People with increased standoff distances, in Controlled Airspace, and over 400 feet AGL Uncontrolled Airspace; and,
- 150 kg to 650 kg VLOS in Basic Operations above 400 feet AGL.

Each category will be subject to different requirements for the organizational entity, the pilot, the product (the aircraft), and the procedures. As a result of these amendments, SFOCs will no longer be required for these types of operations. However, SFOCs will still be required for higher-risk and more complex operations.

Use of Weight to Determine Regulatory Cut-Offs

In addition to where a pilot is operating and how close they are in to people, TC proposes to continue to use the weight of the remotely piloted aircraft (RPA) for assessing the risk of an operation. It is acknowledged that the JARUS SORA relies heavily on kinetic energy; however, TC's proposed approach focuses on the weight of the RPA rather than kinetic energy for several reasons, including providing a clearer path to compliance for manufacturers and industry, and alignment with the framework in place in the CARs for aircraft with a pilot on board.

The increased weight thresholds were arrived at using information based on kinetic energy and speed; recommendations from the Canadian Aviation Regulation Advisory Council (CARAC) Unmanned Aerial Vehicle Systems Design Working Group; and other emerging international standards; weight thresholds used for Light Sport Aircraft and Ultra-light aircraft; as well as, international alignment with other civil aviation authorities — the Federal Aviation Authority (US), European Aviation Safety Agency (Europe), National Civil Aviation Agency (Brazil) Civil Aviation Safety Authority (Australia), and North Atlantic Treaty Organization.

[3] Based on Statistics Canada Dissemination Area data

Program Administration

Transport Canada will adopt a similar approach to the implementation of Part IX regulations by leveraging the online Drone Management Portal to deliver services. This would include, but is not limited to, elements such as registration and exam delivery. These services would also be subjected to fees where applicable.

Application

These regulatory amendments would apply to any pilot or organization operating an RPAS above 25 kg within visual line of sight and any operations beyond visual line-of-sight that fall within the scope of this regulatory package.

Based on industry and experience to date, BVLOS operations will likely be largely commercial; however, it is recognized that there may be some recreational pilots who wish to fly smaller RPAS beyond visual line of sight as well. The existing Part IX regulations for operations within visual-line-of-sight did not make a distinction between recreational and commercial operations and TC is proposing to continue with that same approach. As a result, TC is looking to introduce a 'localized' BLVOS category, whereby pilots with an RPAS less than 25 kg, remaining below a certain altitude can perform operations such as using the "follow-me" function, flying around a building or obstacle, or beyond the tree line without a visual observer being subject to the general BVLOS requirements being proposed in this regulatory package.

Low-Risk BVLOS Operations				
Weight Threshold	**Isolated Areas** (1 km from area with a population density greater than 25 ppl per sq km.)	**Within 1km of an area with a population of more than 25 ppl. per sq. km.**	**Over an area with a population density of more than 25 ppl. per sq. km.**	**Controlled Airspace*** (requires ATS approval)
650 kg +	SFOC	SFOC	SFOC	SFOC
150 kg – 650 kg	✓ RPAS: Declaration+ ✓ RPAS Operator Certificate ✓ Pilot: Operational Level Rating	SFOC	SFOC	SFOC
25 kg – 150 kg	✓ RPAS: Declaration ✓ RPAS Operator Certificate ✓ Pilot: Operational Level Rating	✓ RPAS: Declaration+ ✓ RPAS Operator Certificate ✓ Pilot: Operational Level Rating	SFOC	SFOC
250 g to 25 kg	✓ RPAS: Declaration ✓ RPAS Operator Certificate (light) ✓ Pilot: Operational Level Rating	✓ RPAS: Declaration ✓ RPAS Operator Certificate (light) ✓ Pilot: Operational Level Rating	✓ RPAS: Declaration+ ✓ RPAS Operator Certificate (light) ✓ Pilot: Operational Level Rating	✓ RPAS: Declaration+ ✓ RPAS Operator Certificate (light) ✓ Pilot: Operational Level Rating

= New
= Existing

*Also includes proximity to uncontrolled airports and aerodromes as per 901.47

Expansion of Existing VLOS Operations					
Weight Threshold	Basic Operations	Advanced Operations			
		Near People	Over People	Controlled Airspace* (requires ATS approval)	> 400 ft AGL Uncontrolled Airspace
650 kg +	SFOC	SFOC	SFOC	SFOC	SFOC
150 kg – 650 kg	✓ **RPAS:** Declaration ✓ **Pilot:** Advanced Pilot Certificate	SFOC	SFOC	SFOC	✓ **RPAS:** Declaration+ ✓ **Pilot:** Operational Level Rating
25 kg – 150 kg	✓ **RPAS:** No Declaration ✓ **Pilot:** Advanced Pilot Certificate	✓ **RPAS:** Declaration ✓ **Pilot:** Operational Level Rating	✓ **RPAS:** Declaration+ ✓ **Pilot:** Operational Level Rating	✓ **RPAS:** Declaration+ ✓ **Pilot:** Operational Level Rating	✓ **RPAS:** Declaration ✓ Pilot: Operational Level Rating
250 g to 25 kg	✓ **RPAS:** No Declaration ✓ **Pilot:** Basic Pilot Certificate	✓ **RPAS:** Declaration ✓ **Pilot:** Advanced Pilot Certificate	✓ **RPAS:** Declaration ✓ **Pilot:** Advanced Pilot Certificate	✓ **RPAS:** Declaration ✓ **Pilot:** Advanced Pilot Certificate	✓ **RPAS:** Declaration ✓ **Pilot:** Advanced Pilot Certificate

= New
= Existing

*Also includes proximity to uncontrolled airports and aerodromes as per 901.47

PROPOSED AMENDMENTS

Registration

This proposal will extend all current registration requirements from RPAS with a maximum take-off weight between 250 grams and 25 kilograms to all RPAS with a maximum take-off weight between 250 grams and 650 kilograms. All existing rules (CARs Part IX, Subpart I, Division II) regarding registration and marking the aircraft would still apply.

RPAS Operator Certificates

TC is proposing to implement certain operational requirements that would be scalable to the size, nature and complexity of the operations, activities, hazards and risks associated with the RPAS operations.

As part of this, TC is proposing to introduce an RPAS Operator Certificate (ROC), similar to traditional aviation's Air Operator Certificate but appropriately scaled for lower-risk RPAS BVLOS operations. TC will be looking at various thresholds that would trigger the requirement for a ROC, such as the weight of the RPA, the size of the

organization, the geographical distribution of the organization, the number of pilots, and the size of the RPAS fleet.

The introduction of the ROC is intended to create a framework for an organization or an individual pilot to have certain elements and processes in place to ensure that risks are being managed. This would include the implementation of standard risk mitigation practices such as the Specific Operational Risk Assessment (SORA); a system for continuous improvement; standard operating procedures (SOPs); an appointed Accountable Executive; an appointed Chief Pilot of Operations; and an appointed person who is responsible for all the RPAS maintenance. For smaller organizations or for a single individual, more than one appointment could be made to the same person.

A system for continuous improvement would focus on how an organization or an individual pilot manage risk above regulatory compliance. It defines how an organization or individual pilot intend the management of aviation safety to be conducted as an integral part of their business practices, and regular operations. Key components of continuous improvement could include: a safety management plan, documentation, safety oversight, training, quality assurance, and emergency response.

Before receiving an ROC, the operational requirements would need to be validated by an Organizational Proficiency Check (OPC) made by a third party. The OPC by the third party will need to be performed by an individual who meets certain criteria and training, such as holding an Advanced Pilot Certificate with a Flight Reviewer rating, and has received training on performing an OPC, as well as the SORA. The person who conducts the OPC would also need to be affiliated with a self-declared Training Provider, and TC would make this information readily available on its website. The OPC process will be a holistic check of an organization's or individual's ability to operate in a complex environment safely, utilizing the latest risk management techniques with trained individuals. In order to maintain a RPAS Operator Certificate, the certificate holder would be subject to OPCs periodically over time. Transport Canada intends to publish an OPC guide similar to other successful delegated programs, to ensure standards are known, and upheld.

Alongside the operational requirements, TC is proposing to require liability insurance in some cases.

The Pilot

Expansion of the Existing Part IX Advanced Pilot Certificate to include 'Localized' BVLOS

As part of this regulatory package, TC is proposing to extend the operational procedures for pilots with valid Advanced Pilot Certificates using a RPAS that weighs between 250 grams and 25 kg such that they may operate beyond visual line of sight if they remain under a certain altitude (e.g. 400 feet AGL in most cases) or remain within 100 feet (30 m) or less above and 200 feet (61 m) or less horizontally from any building or structure, and are capable of monitoring the airspace to avoid other aircraft and not be at risk of a collision within certain boundaries. Once they have met additional regulatory requirements, this will permit operations, such as flying around a building for inspections or surveying a field or crop and going beyond the tree line. Please note that all other applicable VLOS and BVLOS rules will apply, such as access to controlled airspace and the RPAS system must have been declared to meet the new requirements for BVLOS operations in the existing Standard 922.

Pilot Certification for BVLOS

TC is looking to introduce a graduated pilot certification process building off of the existing regime under Part IX, and is proposing to introduce a RPAS Operational level rating for pilot certification with this regulatory package. Additional operational knowledge and skills are required to fly beyond visual line of sight, such as a higher level of airspace knowledge, weather, human factors, and a greater understanding of the equipment function and maintenance.

Furthermore, as operations move beyond visual line of sight, it increases risks with longer and more complex flights, it will be imperative that pilots are mentally fit to operate the aircraft safely. This could be done through a self-declaration process and potentially validated by a provincially licensed doctor.

A prerequisite to the RPAS Operational level rating would be an Advanced Pilot Certificate. The minimum age requirement would increase to 18 years of age, with the completion of a ground school and flight review at a self-declared school that meets the additional requirements for beyond visual-line-of-sight operations. TC will leverage the existing knowledge requirements under TP 15263 (Knowledge Requirements for Pilots of Remotely Piloted Aircraft Systems 250 g up to and including 25 kg, Operating within Visual Line-of-Sight) and include additional elements based off other traditional aircraft examinations where applicable. An increased level of knowledge is required in relation to technical issues that could arise while flying BVLOS, such as various aviation management tasks, radio theory and usage, command and control linkages, navigation, weather, risk mitigation strategies for hazardous situations and human factors.

This will create a foundation that builds towards a future pilot certification levels for BVLOS operations for higher risk operations, and supports the foundation required for the proposed International Civil Aviation Organization (ICAO) RPAS Pilot Licence in future amendments.

Lastly, in terms of pilot recency requirements, TC will maintain the same approach as the existing Part IX section 901.56 – recency must have been performed within the last 24 months preceding the flight. This may require some additions to section 921.04 of the existing Standard 921 — Small Remotely Piloted Aircraft in VLOS.

The Impact on the Existing Part IX VLOS Rules

With the additional scope increase of RPAS operations to include BVLOS with larger machines, this will also have an impact on the existing rules for VLOS. TC will remove the requirement to obtain a Special Flight Operations Certificate (SFOC) for VLOS flights with an RPAS with a maximum take-off weight between 25 kg to 650 kg. In order to fly the RPAS within this increased weight threshold in the existing Part IX Basic Environment, a pilot will be required to obtain an Advanced Pilot certificate, and the RPAS could be subject to additional manufacturer requirements that are identified below through the Declaration and Declaration Plus process. In order to fly VLOS within the Advanced Environment of Part IX with an RPAS weighing between 25 kg and 150 kg, in controlled airspace, near and over people, a specific operational level rating would be required. All other applicable VLOS rules, such as a safety assurance declaration for the RPAS would still apply.

The Product

This proposed regulatory package would provide new rules for the operation of RPAS weighing up to 650 kg in both VLOS and BVLOS operations.

For operations that are deemed to have a low enough risk, there would be no product engineering or airworthiness requirements on the RPAS and RPAS related systems - similar to Basic Operations under the existing Part IX.

From a Product Airworthiness standpoint, there would be two levels of airworthiness:

1. Declaration:

Similar to Advanced Operations under Part IX, the manufacturer would be required to submit a safety assurance declaration to Transport Canada. The declaration would be made against existing and new requirements within Standard 922.

2. Declaration Plus:

This would be intended to act as a step between RPAS requiring a declaration and RPAS that will eventually be subjected to an accreditation process. These operations would have a high enough risk and complexity that a Declaration is not adequate, but a full accreditation or certification program is also not required. We are proposing three options for what could constitute a Declaration Plus.

> Option 1: Submit a declaration using a specific industry consensus standard as Means-of-Compliance (MOC).
>
> Option 2: Submit a declaration with all supporting evidence of compliance.
>
> Option 3: Submit a declaration that is supported by testing and evaluation that has been supervised and/or endorsed by a third party.

Impact on the Existing Declarations & Undeclared RPAS

The proposed amendments would extend Part IX regulations to include larger RPAS with a maximum takeoff weight between 25 kg and 150 kg in both Basic and Advanced environments under the existing Part IX. As is the case with small RPAS operating under existing Part IX regulations, there would be no specific airworthiness standards associated with systems operating solely in Basic environments. For Advanced environments, the manufacturer would still be required to self-declare their systems as compliant with the relevant technical requirements in Standard 922 in accordance with the regulations. The stand-off distances for RPAS above 25 kg flying VLOS would increase – see Procedures section below for more details. The proposed amendments would also extend VLOS altitude operating areas above 400 feet AGL in uncontrolled airspace in which case, the manufacturer would be required to self-declare that the system meets the associated technical requirement in Standard 922 for that operating environment. RPAS weighing more than 150 kg but less than 650 kg would also be allowed to operate under VLOS conditions in Basic environments with a self-declaration stating compliance to the associated technical requirement in Standard 922.

New Standards added to Standard 922

This proposal includes the extension of Standard 922 to address the RPAS engineering requirements for BVLOS operations and RPAS above 25 kg. The intent is that there would be no change to the requirements for existing Part IX (less than 25 kg, VLOS) operations. The requirements would be expanded to include VLOS operations with RPAS above 25 kg as well as lower-risk BVLOS operations. See **Annex A** for a table that summarizes the changes to Standard 922.

Detect and Avoid (DAA) System Requirements

In areas that fall under Air Risk Class – A (isolated areas where there are no traditional aircraft), there will be no DAA requirements. All other BVLOS operations will need to have a solution for detection and avoidance of other aircraft. That being said, certain lower-risk operations will be permissible with DAA being performed by a visual observer such that the observer can see all the aircraft in the operational volume where the RPAS is located. For example, this could be feasible in an operation that remains below 400 feet AGL with flat terrain and within approximately 3 km of the visual observer.

The technical requirements for the DAA system are derived from the Operational Risk Assessment methodology provided by the JARUS SORA and Advisory Circular 903-001. Performance objectives are scaled based on the expected traffic density in the operational airspace, using the Air Risk Category (ARC) concept. AC 903-001 - RPAS Operational Risk Assessment provides the performance objectives in two formats:

(1) As a System Risk Ratio, which refers to the ability of the complete, 'end-to-end' DAA system to mitigate potential collisions with conflicting traffic; and,

(2) As lower-level performance objectives against five DAA functions (Detect, Decide, Command, Execute, and Feedback) which, taken together, are considered to provide performance equivalent to the System Risk Ratio for the corresponding ARC.

It is recognized that successfully meeting the Detect function performance objectives for ARC-b and ARC-c airspace, which is the risk and likelihood of encountering other aircraft, particularly for non-cooperative aircraft, is challenging. However, effective Detect performance is a critical portion of the overall mid-air collision risk mitigation, and therefore needs to be demonstrated to a reasonable level of confidence. At this time, TC is proposing three means of compliance when demonstrating that the Detect Function of a DAA system can meet the required level of robustness for the proposed operation.

For the Means of Compliance for DAA Detect Performance, please see **Annex B**.

Introduction of the Declaration Plus System

Declaration Plus is intended to provide additional robustness to the system design assurance retaining desirable aspects of the RPAS declaration system. Key qualities of both the existing Declaration and the new Declaration Plus system are:

- The responsibility for the content and substantiation of the declaration remains with the manufacturer/modifier making the declaration.
- Unlike traditional aviation product certification, Transport Canada or its delegates will not be making any initial findings of compliance.
- Declaration and Declaration Plus allow variation in the means of compliance for each standard. This is especially appropriate considering how rapidly RPAS technology changes.
- Provides a path for a manufacturer to grow to Accreditation or Certification of their RPAS in the future.

TC is proposing that all three Declaration Plus options would be available to applicants. Due to the fast pace and innovation of the RPAS industry, there will not always be an industry standard to use for Option 1. Having Option 2 or Option 3 available would provide for a means to validate declarations in these cases.

For more information on Options for Declaration Plus, please see **Annex C**.

For RPAS that fall within the Declaration Plus category, there would be an additional requirement for annual mandatory reporting, regardless of the method used to make the declaration. This would require manufacturers who have made declarations under the Declaration Plus process to participate in an annual renewal of their declaration by submitting a report documenting activities such as service reports, design changes, operating hours and incidents associated with the design. All organizations would be subject to oversight and if requirements are not being met, the declaration would be revoked, resulting in the invalidation of registrations in that operating environment.

The proposed regulatory amendments would require a manufacturer to declare using the Declaration Plus process for the following operating conditions:

- VLOS operations with an RPAS weighing between 25 kg and 150 kg over people;
- BVLOS operations with an RPAS weighing between 250 g and 25 kg over people, in controlled airspace;
- BVLOS operations with an RPAS weighing between 25 kg and 150 kg near people; and,
- BVLOS operations with an RPAS weighing between 150 kg and 650 kg in isolated environments.

Manufacturer Maintenance Requirements

Under the existing Part IX, manufacturers must comply with section 901.78. TC would be maintaining the same approach for the lower-risk BVLOS regulations. The manufacturer would need to identify subsections 901.78 (a) to 901.78 (c) at a minimum, as well as identify any applicable training or knowledge that may be required to perform maintenance duties, particularly as the weight of the RPA increases.

Furthermore, there must be an appointed person responsible for RPAS maintenance who would be required to oversee all the maintenance procedures specified in the manufacturer's maintenance manual. This would apply

to an individual pilot or an organization operating RPAS above 25 kg. This person would also be required to keep a maintenance control manual (MCM) up-to-date, which would need to be updated regularly on items, such as organizational policies, procedures as well as any maintenance carried out. This person would also be responsible to ensure that all personnel assigned maintenance duties on the RPAS fleet have received appropriate training. All maintenance records must be compiled in an annual airworthiness information report that is kept in accordance with the existing section 901.48 in Part IX.

Remote Identification (ID)

The Federal Aviation Administration (FAA) published a Notice of Proposed Rulemaking in December 2019 outlining its proposal for RPAS to remotely identify. The tracking, detection and identification of the aircraft is a common safety feature of a safe airspace system and is done through a variety of methods for traditional civil aviation.

Remote ID is viewed by industry and regulators as an important factor in developing technology solutions for RPAS traffic management (RTM), fostering the growth of the sector, and safely integrating RPAS into airspace systems. It refers to the ability of RPAS in airspace to broadcast identification information in a given area in real time.

TC is assessing Canada's operational needs, the drivers for requiring remote ID, where it would be required and which stakeholder community it would serve when considering the options moving forward. Furthermore, the department will be assessing potential standards, requirements and regulations on tracking, detection and identification of RPAS.

TC is looking at whether it may be feasible to introduce a requirement over a delayed coming into force that RPAS broadcast their registration number at a bare minimum. An on demand broadcast could be the first step towards a full tracking and detection system that would eventually support RTM in the coming years. Remote ID is particularly important for BVLOS operations, as well as VLOS operations in controlled airspace with RPA above 25 kg, as it can provide a form of tracking and detecting for other airspace users or people on the ground. As part of this potential requirement, TC would also explore grandfathering options and delays in coming to force for the existing fleet. The department would also be looking to industry for standards, such as ASTM, for options for means of compliance.

Regulations to Address the Security Challenge of Illegal RPAS Use

The increased accessibility of RPAS has led to renewed attempts to exploit the technology for unlawful purposes. This topic has been a growing concern as there have been an increasing number of RPAS incursions at international and Canadian airports. These RPAS incidents have been disruptive in nature, paralyzing airport operations and causing economic losses.

The current regulations in place for RPAS specifically address the legitimate operation of RPAS. The absence of regulations that address the illegitimate operation affects the ability to rapidly respond to illegal RPAS use. To

address this security challenge, TC will be evaluating how to best issue regulations, standards, and/or requirements to counter illegal RPAS use in the airport environment.

The first line of defense against an illegitimate RPAS is detection. TC will be assessing potential standards, requirements, and/or regulations for RPAS detection technology in the airport environment, including assigning responsibility for detection of RPAS in the airport environment.

Once an RPAS has been detected, the next step is to mitigate (i.e. remove) the RPAS threat. Currently, legal authorities for RPAS threat mitigation are limited to a few agencies in Canada and must further analyze how best to counter this evolving security challenge. TC will be evaluating how to best issue regulations, standards and/or requirements for RPAS risk mitigation in the airport environment.

Considering the complexity of the airport environment, the department will be looking to identify an appropriate technological solution(s) that can be safely deployed at and around airports.

The Procedures

The introduction of a lower-risk BVLOS regulatory framework would extend the existing Part IX VLOS framework. The concepts of “Basic Environment”, “Near People” and “Over People” would be maintained; however, as the weight of the RPA increases, the standoff distance required from people not involved with the operation would also increase. The table below provides a depiction of the changes in stand-off distances.

Mass	VLOS Basic	Near People	Over People
250 g to <25 kg (Current)	>100 feet (30 m) from people	<100 feet (30 m) and >16 feet (5 m) from people	<16 feet (5 m) from people
>25 kg to 150 kg (Proposed)	>300 feet (91 m) from people	<300 feet (91 m) and > 100 feet (30 m) from people	<100 feet (30 m) from people
>150 kg to 650 kg (Proposed)	>500 feet (152 m) from people	<500 feet (152 m) and >200 feet (60 m) from people	<200 feet (60 m) from people

Operational Environment for Basic VLOS Operations

Existing Part IX regulations require that operators of small RPAS maintain a horizontal distance greater than 100 feet from people on the ground not involved with the operation. Noting that as the size of the RPA increases, other operational metrics likely also increase such as the speed and complexity of the operation as well as the probability of severe injury if an incident occurs. Due to this fact, the new larger RPA weight classes require an increased standoff distance from people in order to qualify for a Basic operational environment.

For the 25kg-150 kg weight threshold, TC is proposing 300 feet as the minimum distance from people not involved in the operation. This standoff distance represents a mid-way point between the previously set 100 feet from the existing Part IX rules and the proposed stand-off distance below for RPAS above 150 kg which is based off traditional aviation.

For the 150 kg - 650 kg RPA category, pilots would have to maintain at least 500 feet from people not involved with the operation in order to be in Basic VLOS Operations. Acknowledging that at the upper end of this scale, the RPA is a similar size and mass to a small traditional aircraft, this distance is based on related rules for

traditional aircraft. CAR 602.14(2) (b) requires that aircraft not be operated less than 500 feet from people. Furthermore, 500 feet is also the required standoff distance for low-energy aircraft at special aviation events (airshows). With these larger machines, people in buildings will not be considered protected and standoff distances near infrastructure are being considered.

For a VLOS operation with an RPAS greater than 25 kg to qualify as a Basic Operation, the operation needs to follow the limitations specified in CAR 901.62 (a) and (d). Namely the operation must be outside controlled airspace, more than 3nm from the center of an airport and more than 1nm from the center of a heliport. The only amendments related to operational environments would be to the definition of Basic Operations for RPAS larger than 25 kg is to CAR 901.62(b) and (c) standoff distances.

Operational Environment for Lower-Risk BVLOS Operations

For BVLOS operations, it can be difficult for the pilot or crew to determine how close an RPAS is to people not associated with the operation. This has been taken into consideration in the development of the following proposal.

There are four categories of BVLOS operations being proposed:

1. Isolated operations.
2. Within 1km of an area with a population of more than 25 people per square kilometer.
3. Over an area with a population density of more than 25 people per square kilometer.
4. In Controlled Airspace.

For VLOS operations, the operational category can be established tactically during the operation – the pilot can actively monitor their operational area to ensure that the standoff distances associated with the operation are respected. For BVLOS operations, the intent is that the operational category is established during the flight planning phase. An operator would use a combination of maps, site surveys and other means required to establish the location of people not related to the operation.

Operations in Isolated areas; within 1km of an area with a population of more than 25 people per square kilometer; and, over an area with a population density of more than 25 people per square kilometer must remain below 400 feet AGL.

1. Isolated Operations

Isolated operations in the BVLOS regime can be compared to Basic VLOS Operations in that the operations, the standoff distances from people and traditional aircraft provide a certain level of risk mitigation.

In order to determine an Isolated BVLOS operation, the pilot would be required to ensure that their entire BVLOS operational flight is more than 1 km from any area with a population density greater than 25 people per square kilometer.

As a starting point, the most recent Statistics Canada Census data can be used to find dissemination areas that have a population density less than 25 people per square kilometer, and these areas potentially qualify for

Isolated BVLOS operation. However, additional due diligence is required on the part of the pilot to ensure that the areas within 1km of the operation volume do not:

- Include any new housing developments since the last census that would affect the population density; and,
- Don't contain areas where people would reasonably be expected to congregate.

In order to accomplish this and perform one's due diligence, pilots would need to ensure that they are taking steps, such as: consulting the most recent Census data; consulting any other recent data and maps available; consulting the date and timing of outdoor events that could fall within the boundaries of their operation; and, factoring in the time of day of the operation and whether it could be impacted with a higher risk of people congregating in one area.

It is acknowledged that the proposed definition for Isolated Operations will not cover every conceivable situation – an operator cannot guarantee that there are no hikers or campers in a remote location, and that there is no occupied homestead in a remote location. However, it is intended to protect the vast majority of the population from the risks associated with BVLOS operations.

Transport Canada would continue its partnership with the National Research Council to maintain the Drone Site Selection Tool website in order to capture this information, and making it easily accessible for pilots.

2. *Within 1km of an area with a population of more than 25 people per square kilometre.*

BVLOS operations that would be considered "Near People" include any area within 1km of an area with a population of more than 25 people per square kilometer, or within 1km of a population center[4] as defined by Statistics Canada.

3. *Over an area with a population density of more than 25 ppl. per sq. km.*

BVLOS Operations "Over People" would be any operation over an area with a population density of more than 25 people per square kilometer or inside a Population Center as defined by Statistics Canada.

4. *Controlled Airspace*

BVLOS in controlled airspace is considered any airspace other than Class G as defined in the Designated Airspace Handbook.

[4] Area with a population of at least 1,000 and no fewer than 400 persons per square kilometer.

Additional Operational Procedures for Lower-Risk BVLOS

Consistent with the existing Part IX, under the proposed amendments RPAS pilots must yield to traditional aviation while flying under BVLOS operations. Furthermore, RPAS emergencies will not have priority over any urgent situation in traditional aviation.

Night operations will be permitted under certain situations; however, in all cases, the weather minimum should never be lower than traditional Visual Flight Rules for aircraft. The pilot must also continue to follow all the site survey obligations under Part IX, section 901.27, for the entire BVLOS flight before take-off and landing. Other pre-flight requirements would increase through this proposal by ensuring the amount of fuel or energy is sufficient for safe completion of the flight, as well as potential contingencies, and enough to proceed to a predetermined alternate landing site. These procedures and limits must be captured in either written or digital format and easily accessible to the pilot. Furthermore, RPAS pilots must have a detailed flight plan before commencing operations that includes but is not limited to ensuring there is a means to monitor flight and the capability to provide timely communications with Air Traffic Services and other airspace users when applicable. In the event of a lost link, the RPAS pilot must have a pre-programmed alternate recovery site that is not an aerodrome.

RPAS below 250 grams

Since the coming into force of the Part IX Regulations in June 2019, there has been an increase in the popularity of RPAS weighing below 250 grams, and these “micro-drones” are increasingly sophisticated. TC has received many comments that the rules for these micro-drones are not clear. Currently, Section 900.06 applies to micro-drones and requires the pilot to fly safely. It is the pilot’s responsibility to fly in a way that doesn’t pose a danger to people or other aircraft. TC is examining whether clarification and further guidance is required.

ECONOMIC FRAMEWORK FOR RPAS

RPAS are aircraft as per the definition in subsection 3(1) of the *Aeronautics Act* and as such certain provisions of the *Canada Transportation Act* (Act) apply (sections 55, 57 and 61) in the event a drone carries cargo or passengers (i.e. is providing an air service as defined in the Act). Namely, an RPAS that is providing an air service is subject to the Canadian ownership and economic licensing provisions of the Act (i.e. RPAS operator must be 51 percent controlled in fact by Canadians and would require an economic license issued by the Canadian Transportation Agency).

For those RPAS operators engaged in activities that fall under the definition of Specialty Air Services (i.e. aerial photography; pipeline inspections; crop dusting; etc.), these operators are not subject to the Act, but rather the *Canadian Aviation Regulations*. The “Canadian” control-in-fact threshold in the CARs is 75 percent and there are no economic licensing requirements.

Questions for Stakeholders:

1. Other than the fact that traditional aircraft are piloted, do you see other differences between traditional aircraft and RPAS that would merit a different legal framework governing their economic regulatory framework?

2. Should the economic framework apply universally, or only to certain types of RPAS or RPAS related activities (e.g. based on payload, distance flown, etc.)?

3. Should some or all RPAS operators be subject to a different licensing requirements than those applied to traditional aircraft?

4. Traditional aircraft are bound by foreign ownership limits – 49 percent with safeguards for commercial carriers and 25 percent for Specialty Air Services.

    - Do such limits make sense for RPAS operators? Or would you be open to allowing full right of establishment to foreign RPAS operators as an interim or long term measure?
    - Should this be contingent on obtaining similar thresholds in the countries of those foreign RPAS operators wishing to establish in Canada?

5. Is it important that Canada has a strong domestic RPAS industry or is the sector global in nature and consequently there should no barriers to entry to global competitors?

CONCLUSION

Transport Canada is holding a 60-day consultation period until Monday, June 22nd, 2020, and is inviting stakeholders to share their comments on these proposed amendments. Please send comments to: TC.RPASRegulations-ReglementsSATP.TC@tc.gc.ca.

After the consultation period, TC will be developing a proposal targeting pre-publication in *Canada Gazette, Part I* in spring 2021, with a subsequent comment period.

REFERENCES

AC-903-001-RPAS Operational Risk Assessment:

https://www.unmannedsystems.ca/wp-content/uploads/2019/07/DRAFT-AC-903-001-RPAS-Operational-Risk-Assessment.pdf

Canadian Aviation Regulations:

https://www.tc.gc.ca/en/transport-canada/corporate/acts-regulations/regulations/sor-96-433.html

Canadian Transportation Agency:

https://www.otc-cta.gc.ca/eng

Designated Airspace Handbook:

https://www.navcanada.ca/EN/products-and-services/Documents/DAH_Current_EN.pdf

Drone Site Selection Tool:

https://nrc.canada.ca/en/drone-tool/

Standard 922:

https://www.tc.gc.ca/en/transport-canada/corporate/acts-regulations/regulations/sor-96-433/standard-922.html

Statistics Canada – Census Program:

https://www12.statcan.gc.ca/census-recensement/index-eng.cfm

ANNEX A – Standard 922

As discussed previously in this document, Standard 922 – RPAS Safety Assurance would be updated to define the technical requirements for RPAS operating under the new proposed rules. In some cases existing standards are expanded for RPAS larger than 25 kg. In other cases new standards are created to address specific technical requirements of aircraft performing BVLOS operations.

The following table summarizes the proposed changes to Standard 922:

Standard	Title	New/Revision Required	Comment
922.01	Application	Revision required.	Update required.
922.02	Basic Operations	No Change	Remains (reserved).
922.03	Critical Infrastructure	No Change	Remains (reserved)
922.04	Operations in Controlled Airspace	Revision required.	The wording will be updated to clarify the intent. There will be no change to the technical aspects of the requirement.
922.05	Operations Near People	Revision required.	The definition of “Near People” will be expanded for RPAS >25kg and “Remote” probability will be defined for RPAS >25kg.
922.06	Operations Over People	Revision required.	The definition of “Over People” will be expanded for RPAS >25kg and “Remote” probability will be defined for RPAS >25kg.
922.07	Containment Requirements	New	This standard will be based on the AC 903 standards for containment. This standard requires that failures that could cause the RPAS to leave the operational volume be sufficiently improbable.
922.08	Command and Control Link	New	This standard will place reliability requirements on the C2 link. It will also place behavioural requirements on the RPAS in the event of a C2 link loss.
922.09	Detect, Alert, Avoid System	New	This standard will place requirements on the DAA system associated with an operation in respect of system reliability and risk ratios.
922.10	RPS Human Factors Requirements	New	This standard will place requirements on the design and usability of the RPAS Pilot station.
922.11	RPAS Environmental Qualification	New	This standard will requires that the manufacturer qualify their RPAS for a specific environmental envelope and inform the operator of this envelope.

The following tables map the various standards of Standard 922 to the various proposed RPAS flight regimes. In order for a product to operate in each flight regime, a manufacturer declaration will need to be made against the standards listed. For example, for a 25kg-150kg RPAS to operate "VLOS near People", a manufacturer declaration to 922.05 (Operations near People) and 922.07 (Containment Requirements) will be required. For that same RPAS to operate "BVLOS near People" additional manufacturer declarations would be required against 922.08, 922.09, 922.10, and 922.11.

Standard 922 Applicability for Low-Risk BVLOS Operations

Weight Threshold	Isolated Areas (1 km from area with a population density greater than 25 ppl per sq km.)	Within 1km of an area with a population of more than 25 ppl. per sq. km.	Over an area with a population density of more than 25 ppl. per sq. km.	Controlled Airspace*
650 kg +	SFOC	SFOC	SFOC	SFOC
150 kg – 650 kg	922.07 922.08 922.09 922.10	SFOC	SFOC	SFOC
25 kg – 150 kg	922.07 922.08 922.09 922.10	922.05 922.07 922.08 922.09 922.10 922.11	SFOC	SFOC
250 g to 25 kg	922.07 922.08 922.09 922.10	922.05 922.07 922.08 922.09 922.10 922.11	922.06 922.07 922.08 922.09 922.10 922.11	922.04 922.07 922.08 922.09 922.10 922.11

*Also includes proximity to uncontrolled airports and aerodromes as per 901.47

Standard 922 Applicability for VLOS Operations

Weight Threshold	Basic Operations	Advanced Operations			
		Near People	Over People	Controlled Airspace*	> 400 ft AGL Uncontrolled Airspace
650 kg +	SFOC	SFOC	SFOC	SFOC	SFOC
150 kg – 650 kg	922.07	SFOC	SFOC	SFOC	922.07
25 kg – 150 kg	N/A	922.05 922.07	922.06	922.04 922.07	922.07
250 g to 25 kg	N/A	922.05	922.06	922.04	922.07

*Also includes proximity to uncontrolled airports and aerodromes as per 901.47

ANNEX B – Means of Compliance

This Annex is intended to clarify the tests and validation activities that would be required when qualifying a DAA system in support of a DAA operation. They are intended as a proposal of several means, but not necessarily the only means of showing that a DAA system can meet the risk ratio requirements of Standard 922.09.

Means of Compliance (MoC) - DAA Detect Performance

For both ARC-b and ARC-c airspace, the Detect function performance objective requires a calculation of the required detection volume and a substantiation of a detection rate within that volume. Refer to Draft AC 903-001 Appendix B for an example of a DAA detection volume calculation. Note that, as for the top-level risk ratios, the detection rate requirement is applied equally to cooperative (transponder equipped) and non-cooperative (not transponder equipped) traffic (i.e., if the operational airspace may include non-cooperative traffic, the detection rate must be satisfied for non-cooperative traffic).

Each of the three MoCs below can be applied towards either: a validation of Detect performance within a specific detection volume (e.g. demonstration of a detection volume for a specific operation); or, a more generalized measurement of detect performance which can be used to identify the full spectrum of detection volumes that could be supported. For example, to validate a ground-based sensor for a linear inspection operation, it may not be necessary to collect data throughout the field of regard of the sensor; a central portion covering the detection volume required for the linear inspection may be sufficient. While a validation within a specific, operationally-driven detection volume may require less effort, it is expected that a generalized validation approach would provide greater utility for any DAA solution that is intended to be used to support detection in more than one shape of detection volume

The following considerations are applicable to each of the three MoCs described below:

(a) Source and accuracy of truth data: It should be self-evident that in order to quantify the performance of a system intended to detect aircraft, data recording the true intruder aircraft position and/or kinematics is required. This truth data should be obtained from a source or sources with known and verifiable accuracy (e.g., a TSO-certified GPS or other independently calibrated and validated data source), and should be recorded at a rate sufficient for comparison to the test sensor data and compatible with the overall DAA problem space (i.e., a truth data source that provides one data point per minute is not appropriate). The truth data source(s) should also provide all appropriate data for comparison to the data from the sensor(s) being tested. For example, if the sensor being tested provides position, altitude, and velocity for intruder aircraft then a truth data source that provides position only is not sufficient for a full characterization of the sensor.

(b) System operational limitations: If any operational limitations are being imposed on the use of the sensor system (e.g., only permitting daytime operations or operations in areas free of precipitation), the performance of the system need not be validated in conditions outside of this defined operational envelope.

MoC 1: Analysis with Flight Test Validation

This MoC is a generalized version of the type used to develop and certify traffic collision avoidance systems (TCAS) and other similar systems. It requires significant engineering capability and effort but generates the most robust and transferable dataset.

A Detect performance substantiation using this MoC is expected to include, at minimum:

1. Sensor characterization analysis / modelling: The expected performance of the sensor is analyzed and modeled computationally. This analysis / modeling can be based on first principles (e.g., RF physics for RADAR) or based on developmental test data.
2. Detect performance simulation: The computational model of the sensor system is exercised through extensive simulation of conflicting traffic orientations & maneuvers (e.g., through use of Monte Carlo simulation with validated encounter models - note that most available encounter models were developed in support of TCAS system development and validation and may not be representative of the intended operational airspace).
3. Detect performance validation through flight test: The real-world sensor performance is validated through flight test of a specific set of test cases. These test cases should be selected based on the modeling and simulation results to generate data in the center and at the edges of the expected performance envelope. The test data is then used to compare against and validate the simulation data.
4. If required, the validated computational model of the sensor system is then re-analyzed / simulated for the specific operational environment, including potential effects from terrain, obstructions, weather, etc.
5. If any effects of significance are observed in the simulation of environmental effects, additional flight tests are conducted in a representative operational environment to validate the extent of these effects.

MoC 2: Large Dataset Sensor Validation

This MoC is expected to require somewhat less engineering capability but potentially more time and/or cost than MoC 1 (depending on the sensor type). Essentially, this MoC replaces the simulation methodology of MoC 1 with an extensive data collection effort.

A Detect performance substantiation using this MoC is expected to include, at minimum:

1. Sensor characterization study: The performance envelope of the sensor is established through the collection of a statistically significant test data set, including sufficient variety of traffic types, orientations, and maneuvers as well as any environmental effects that need to be considered (time of day, weather, terrain, etc.). Depending on the sensor type, this will likely require collection of data from multiple locations across multiple days.
2. If required, an analysis is developed showing the expected performance of the sensor system in the specific operational environment, including potential effects from terrain, obstructions, weather, etc. This analysis is created based on the data collected in step (a).
3. A minimum set of flight tests is conducted to validate the expected boundaries of the sensor detection performance in the actual operational environment.

MoC 3: Operationally-Specific Testing

This MoC is expected to require the least engineering effort of the three MoCs described here; however, the results are only applicable to a single operational environment (i.e., a single location).

A Detect performance substantiation using this MoC is expected to include, at minimum:

1. In-situ sensor characterization study: The performance envelope of the sensor is established through the collection of a representative, statistically significant test data set in the actual operational environment. This test data set covers the expected variety of traffic types, orientations, and maneuvers specific to the operational environment, as well as any local effects from terrain, obstructions, weather, etc. This MoC may require less data than MoC 2 since the variety of traffic and potential environmental effects that need to be considered are reduced; however, the results may not be generalizable to another operational environment without significant additional data collection.

ANNEX C – Declaration Plus

This annex summarizes the three options being considered for the "Declaration Plus" design assurance strategy. As mentioned in the NPA above, the intent of Declaration Plus is to:

- Add robustness to whatever means the applicant chooses to use to validate their declarations against each standard.
- Act as a step between the existing Part IX Declaration System and a future Accreditation framework for RPAS manufacturers.

The current assumption is that all three options will be available to manufacturers. Declarations would be made using the option that is most appropriate for the situation.

Option 1: Declaration Plus using specific industry consensus standards

This strategy would allow an applicant to make a declaration to any standard within 922 and use a specific industry standard as a means of compliance towards that standard. The industry standards would be ones that have been reviewed and approved by Transport Canada as valid MOC towards a standard. Similar to the existing declaration system, manufacturers would not be required to submit any substantiating documentation when they make a declaration, however the compliance basis would be more controlled by the specific recognized industry consensus standards in order to ensure a high level of design assurance. An advisory circular or other form of guidance would be maintained to list the industry standards that are considered acceptable means of compliance against each standard in 922. This would create a "menu" of acceptable MOC for each standard in 922. Applicants would be limited to using standards from this list of acceptable standards.

Option 2: Declaration Plus including submission of all Compliance Evidence

This form of Declaration Plus would require a manufacturer to submit all of their compliance evidence along with their declaration to an associated standard in Standard 922. The substantiating documentation would not necessarily include all the detailed test results and validation data, but could include the test methods that were used to validate the declared capabilities of the design and high level test reports and limitations associated with the system. The intent is to ensure that the organization making the declaration has the technical capabilities to make a valid declaration for the associated standards in Standard 922.

Upon accepting the documentation, Transport Canada would acknowledge receipt and process the Declaration Plus. If TC finds the compliance evidence was unsatisfactory, TC would work with the applicant to determine what needs to change prior to a reapplication.

This form of Declaration Plus will be carefully managed to ensure that the responsibility for the declaration remains with the manufacturer and it is not confused with a traditional aircraft certification.

Option 3: Declaration Plus using a supervised/endorsed testing with a third party

This Declaration Plus strategy would require a manufacturer to approach a third party to assist with the testing and review of the Declaration Plus means of compliance data.

Transport Canada would work with the third party candidates and organizations to validate their knowledge, procedures, and experience related to RPAS airworthiness. The third party would need to be knowledgeable in RPAS (and acknowledged as a recognized third party by TC). Essentially, TC would be relying on this third party to perform the role of TC in Option 2 “Declaration including submittal of all evidence”.

This would be similar in some ways to the Flight Reviewer process that exists in Part IX. TC would work with third party individuals and organizations to determine how compliance with standards in 922 can be achieved. In this option, the third party would then make the Declaration Plus to Transport Canada.