



TRUSTED OPERATOR PROGRAM™

PROTOCOL CERTIFICATION MANUAL (PCM)

Edition 1.3

UNMANNED AIRCRAFT SYSTEMS

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*Supporting the Future
of Unmanned Aviation*

Trusted Operator Program — Protocol Certification Manual (PCM)

Edition 1.3

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Edition 1.3

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SECTION 1

INTRODUCTION

INTRODUCTION

Becoming a commercial remote pilot represents an exciting and rewarding career in a dynamic and emerging industry.

The implementation of Part 107 of the Federal Aviation Regulations in the United States, and comparable regulatory frameworks in other nations, have opened a new era of commercial aviation. Unmanned aircraft systems, or UAS, are already transforming fundamental concepts for providing airborne services. UAS can offer dramatic advantages in cost, capability, efficiency and safety of aviation operations, in both traditional and novel applications.

As with any emerging technology, the process of learning, adapting and refining key concepts and rules will take shape over many years. Additionally, research has shown that operating a UAS presents unique human performance and risk factors that must be understood. The Association for Unmanned Vehicle Systems International (AUVSI) is committed to supporting this historic evolution of the aviation industry in a safe, responsible and economically beneficial manner.

These first-generation UAS regulations establish fundamental safety parameters, while providing latitude for evolution of more comprehensive operating guidance as the technology matures. AUVSI's members, working through the association's Remote Pilots Council, are pioneering the development of such a framework. Combining their extensive traditional aviation experience with thousands of hours of recent commercial UAS flight training and operations, they have developed the Trusted Operator Program (TOP).

TOP complements current regulatory compliance by adding elements of:

- Safety Culture
- Best Practices
- Airmanship
- Human Performance
- Codes of Conduct
- Automation Awareness
- Risk Management
- Non-Technical Skills

TOP-certified professional UAS operators (TOP Operators™) benefit from improved:

- ✓ Safety
- ✓ Trust
- ✓ Risk Management
- ✓ Professionalism
- ✓ Reliability

Customers who choose the services of a TOP-certified professional know they are receiving:

- ✓ Demonstrated Competency
- ✓ Advanced Knowledge and Skills
- ✓ Training Appropriate to the Level of Risk
- ✓ Reliability
- ✓ Demonstrated Commitment to Safety

This Protocol Certification Manual (PCM) establishes the policies, procedures and certification requirements for individuals and organizations to become recognized as safe, competent and reliable commercial UAS service providers, certified under the Trusted Operator Program.

TOP CERTIFICATION

- A. Both individuals and organizations operating UAS for commercial and certain other non-hobby purposes may become TOP certified. As used in this PCM, references to commercial UAS operations are understood to include the other non-hobby uses described in this section. Non-hobby purposes include UAS operations by government agencies operating under an FAA certificate of waiver or authorization (COA) or equivalent in other countries. This category also includes voluntary service organizations.
- B. References to FAA regulations throughout this PCM are understood to also mean the relevant and comparable regulations in other countries. Certifying Bodies and Training Providers in those jurisdictions are qualified to identify and apply relevant regulations.
- C. A **protocol** is defined as a specified level of knowledge, ability, performance or compliance. Applicants for TOP certification must demonstrate conformance with each protocol applicable to the level of certification sought.

TOP certification is offered at three levels. These levels correspond to the risk, complexity and nature of the applicant's UAS operations. Functional area certification is contained in section 4 for specialized operations and training providers.



1. Routine operations in accordance with FAR Part 107
2. Operations that do not require a waiver of FAR Part 107
3. Operations in which the remote pilot is competent and proficient
4. Flights using electric aircraft less than 5 lbs or 2 kg
5. Operations that do not have any of the characteristics mentioned in Level 2 or 3 such as operations close to airports, helipads, populated areas, people and livestock

LEVEL 2



1. Any operation that requires a waiver under FAR Part 107
2. Operations that require a visual observer, or sensor operator
3. Operations with elevated risk factors or complexity including but not limited to operations close to airports, helipads, populated areas, people and livestock
4. Operations that do not have any of the characteristics mentioned in Level 3



Any of the characteristics of Level 2, plus the following:

1. Operations in safety-critical and complex areas that require higher levels of risk mitigation
 - Industrial and chemical facilities, including offshore oil rigs, mine sites, power plants
 - Infrastructure, including wind turbines, powerlines, communications towers, rail and pipelines.
2. Operations in any hazardous or extreme environments including:
 - From ships, moving vehicles, aircraft, confined areas and underground
 - Within close proximity to and within severe weather (storm research)
 - Remote, harsh or hostile locations, including wildlife considerations
3. Operations requiring the development and testing of new procedures
 - Operations with UAS over 55 pounds (25 kilograms)

TOP OPERATOR™ CATEGORIES: INDIVIDUALS

REMOTE PILOTS

Individual remote pilots are those providing commercial UAS services on their own, or as workers for a commercial UAS organization. Remote pilots who are already fully trained may gain TOP certification by providing evidence of achieving the

protocols outlined in the PCM, including the requisite flight assessment. TOP training providers and TOP certification bodies can deliver this certification.

Protocols for Level 1 TOP Operator, Remote Pilot		Required
I.	Management System	✓
II.	Operational Procedures	
III.	Training Program	✓
IV.	Maintenance and Inspection Program	
V.	Safety Management System	
VI.	Practical UAS Flight Assessment	

Protocols for Level 2 TOP Operator, Remote Pilot		Required
I.	Management System	✓
II.	Operational Procedures	
III.	Training Program	✓
IV.	Maintenance and Inspection Program	
V.	Safety Management System	
VI.	Practical UAS Flight Assessment	✓

Protocols for Level 3 TOP Operator, Remote Pilot		Required
I.	Management System	✓
II.	Operational Procedures	
III.	Training Program	✓
IV.	Maintenance and Inspection Program	
V.	Safety Management System	
VI.	Practical UAS Flight Assessment	✓

Functional Area Protocols for Level 3 TOP Operator, Remote Pilot		Required
I.	Management System	✓
II.	Operational Procedures	
III.	Training Program	✓
IV.	Maintenance and Inspection Program	
V.	Safety Management System	
VI.	Practical UAS Flight Assessment	✓

REMOTE PILOT INSTRUCTORS

A TOP remote pilot instructor is an individual who is, at minimum, a certified Level 2 TOP Operator remote pilot who has met the additional PCM certification requirements to instruct and assess student remote pilots.

TOP remote pilot instructors may only train students to the level of certification they themselves hold, i.e., an instructor with a Level 2 certification cannot train students for a Level 3 certification.*

Protocols for Level 2 TOP Operator, Remote Pilot Instructor		Required
I.	Management System	✓
II.	Operational Procedures	
III.	Training Program	✓
IV.	Maintenance and Inspection Program	
V.	Safety Management System	
VI.	Practical UAS Flight Assessment	✓

Protocols for Level 3 TOP Operator, Remote Pilot Instructor		Required
I.	Management System	✓
II.	Operational Procedures	
III.	Training Program	✓
IV.	Maintenance and Inspection Program	
V.	Safety Management System	
VI.	Practical UAS Flight Assessment	✓

Functional Area Protocols for Level 3 TOP Operator, Remote Pilot Instructor		Required
I.	Management System	✓
II.	Operational Procedures	
III.	Training Program	✓
IV.	Maintenance and Inspection Program	
V.	Safety Management System	
VI.	Practical UAS Flight Assessment	✓

* TOP remote pilot instructors who act as independent agents for TOP Training Providers must meet the protocols for TOP Level 2 Service Providers.

For a full description and the rules pertaining to each category of certification, please see the definition and rules on page 56 of this manual.

All TOP certifications are valid for two years from the date of issue.

TOP OPERATOR™ CATEGORIES: ORGANIZATIONS

SERVICE PROVIDERS

Organizations operating UAS for commercial and certain other non-hobby purposes may become TOP certified as service providers. Non-hobby purposes include UAS operations by government agencies operating under an FAA certificate of waiver or authorization (COA). This category also includes voluntary service organizations.

A service provider with two or more workers must have at least two remote pilots accountable for safety and training, certified as TOP remote pilots or one remote pilot instructor to maintain its status as a TOP-certified service provider.

Protocols for Level 1 TOP Operator, Service Provider		Required
I.	Management System	✓
II.	Operational Procedures	✓
III.	Training Program	✓
IV.	Maintenance and Inspection Program	✓
V.	Safety Management System	✓
VI.	Practical UAS Flight Assessment	

Protocols for Level 2 TOP Operator, Service Provider		Required
I.	Management System	✓
II.	Operational Procedures	✓
III.	Training Program	✓
IV.	Maintenance and Inspection Program	✓
V.	Safety Management System	✓
VI.	Practical UAS Flight Assessment	

Protocols for Level 3 TOP Operator, Service Provider		Required
I.	Management System	✓
II.	Operational Procedures	✓
III.	Training Program	✓
IV.	Maintenance and Inspection Program	✓
V.	Safety Management System	✓
VI.	Practical UAS Flight Assessment	

Functional Area Protocols for TOP Operator, Service Provider (Optional)		Required
I.	Management System	✓
II.	Operational Procedures	✓
III.	Training Program	✓
IV.	Maintenance and Inspection Program	✓
V.	Safety Management System	✓
VI.	Practical UAS Flight Assessment	

TRAINING PROVIDERS

Training Providers are designated by AUVSI as TOP partners and qualified, upon certification by a Certifying Body, to assess an applicant's readiness to meet TOP protocols, to deliver training found to be necessary to achieve TOP certification and to award TOP certification to individuals who demonstrate conformance with the protocols.

Training providers can only issue TOP certifications using courseware that has been certified by a TOP Certifying Body for

compliance with the TOP PCM. TOP training providers can only issue TOP certification to individuals. They cannot conduct organizational audits to provide organizational TOP certification.

A TOP training provider must maintain two TOP certified remote pilot instructors, to maintain its status as a training provider, as defined by the Management System Protocols. TOP training providers are only certified in accordance with Level 3.

Protocols for Level 3 TOP Operator, Training Provider		Required
I.	Management System	✓
II.	Operational Procedures	✓
III.	Training Program	✓
IV.	Maintenance and Inspection Program	✓
V.	Safety Management System	✓
VI.	Practical UAS Flight Assessment	

Functional Area Protocols for TOP Operator, Training Provider		Required
I.	Management System	✓
II.	Operational Procedures	✓
III.	Training Program	✓
IV.	Maintenance and Inspection Program	✓
V.	Safety Management System	✓
VI.	Practical UAS Flight Assessment	

For a full description and the rules pertaining to each category of certification, please see the definition and rules on page 56 of this manual.

All TOP certifications are valid for two years from the date of issue.

“

Becoming a TOP Operator will inspire confidence in the clients for both individual remote pilots and companies using UAS. It provides a recognized vetting process to ensure safety, reliability, professionalism, and, most importantly, creates an atmosphere of trust.

”

— Tracy Lamb, Vice President of Regulatory and Safety Affairs and Chief Pilot



CERTIFYING BODIES

- A. Both individual and organizational applicants can obtain initial TOP certification and renewal of certification from an AUVSI-designated certifying body
- B. Individual applicants can also obtain initial certification and renewal from an AUVSI-designated Training Provider.
- C. Certifying Bodies are designated by AUVSI as TOP partners qualified to assess an applicant’s ability to meet the protocols for the level of certification sought.

Who Are Certifying Bodies?

TOP certifying bodies are organizations that specialize in formal operational, safety and quality audits and assessments as their core function. They may also provide certifications, audits and assessments to the aviation and broader industries (such as oil and gas, utilities, mining and construction), and have appropriately qualified lead auditors, auditors and qualified assessment staff. TOP certifying bodies do not provide basic aviation or remote pilot training.

What Does a Top Certifying Body Do?




TOP certifying bodies are authorized and monitored by AUVSI to provide TOP Operator Level 1, 2 and 3 certifications in accordance with the PCM. These certifications include management system performance, operational procedures performance, training program performance, maintenance and inspection program performance, safety management system performance, proficiency flight assessments (PFAs), and functional area sign-offs.

Why Are Certifying Bodies Needed?

As with other aviation safety audits, certifying bodies conduct audits and certification of individuals/organizations at the request of an end user (customer), i.e. oil and gas, mining, utilities, construction, law and insurance firms.

It is common practice for end users of aviation services to conduct this type of due diligence prior to and during service contracts of the service provider. By purchasing UAS flight services from a TOP certified operator, the buyer will have assurance that the operator meets protocols for competency and safety established by AUVSI.

HOW LONG SHOULD A TOP AUDIT TAKE?*

	TOP LEVEL	INDIVIDUAL	ORGANIZATION
	LEVEL 1	Approximately 1 Hour	Approximately 1 Hour
	LEVEL 2	Approximately 3 – 5 Hours	Approximately 8 Hours
	LEVEL 3	Approximately 5 – 6 Hours	Approximately 24 Hours

**The times stated above are an estimate of the review and assessment time by an auditor once all correct documentation is provided and complete. Notification of certification will be issued within 3-5 business days.*

AUVSI TOP certifying bodies cannot provide TOP operator training, if remote pilots need training this must be undertaken with a training provider. However, certifying bodies will provide consultation and advice on certification preparation.

HOW TO BECOME TOP CERTIFIED

These are the groups that can provide your TOP certification;

- A. TOP Operator **Certifying Body**
- B. TOP Operator **Training Provider**

**NOTE: See the 'definitions and rules' on page 56*

DIAGRAM 1

This diagram illustrates the pathways to gain your TOP Operator remote pilot, Level 1 certification. Start in the red box, answer the question, then progress in the direction of your answer until you reach the certification icon in the bottom center.

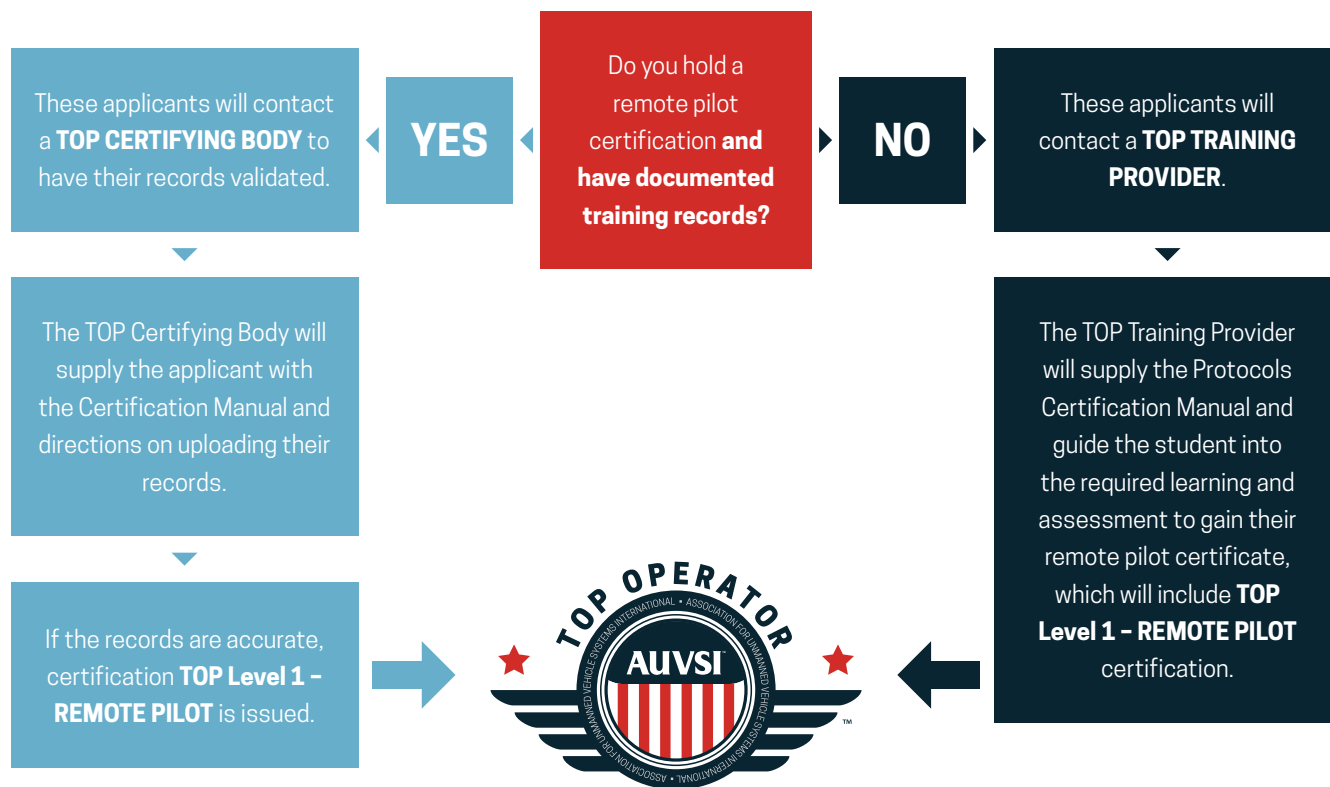
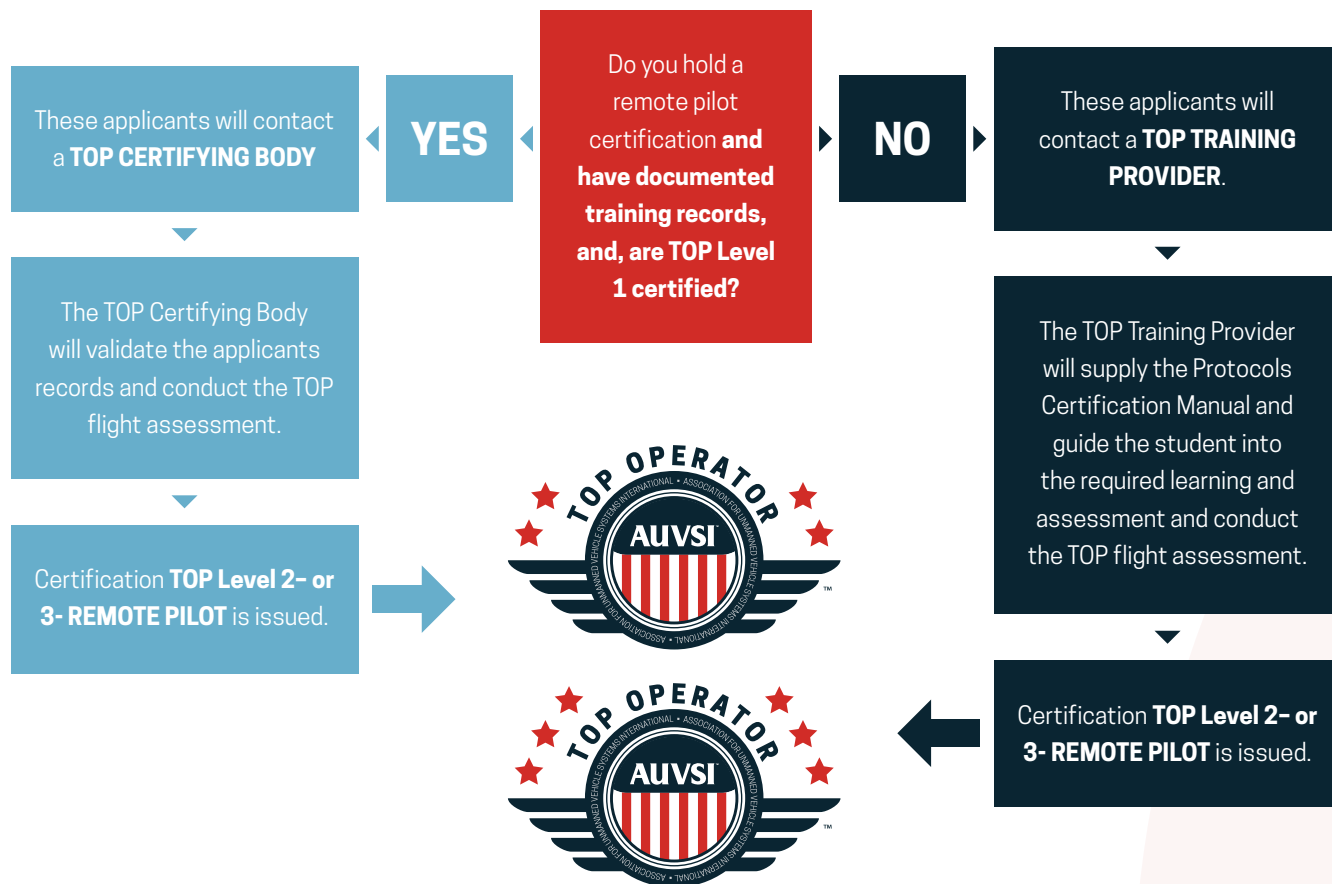


DIAGRAM 2

This diagram illustrates the pathways to follow to become TOP certified for a remote pilot, or remote pilot instructor to Level 2 or 3. Start in the red box, answer the question, then progress in the direction of your answer until you reach the certification icons in the bottom center.



For organizations and remote pilots who are fully trained and have the documentation to support their operations in accordance with the Trusted Operator Program PCM, we recommend contacting a TOP Certifying Body.

For information about becoming a TOP Certifying Body or a TOP Training Provider please contact AUVSI.

TOP OPERATOR CERTIFICATES

Once the organization or remote pilot has successfully completed the training and assessment, they will be awarded a certificate that includes a unique eight-digit certification number. This number identifies the source of the certification and the certificate recipient. The certificate will also display the certification issue date and the renewal date. A lapel pin is also awarded with each certificate.

The stars in the TOP Certification mark correspond to the level of certification the recipient has achieved, i.e., Level 1 training, will have one star on each side of the TOP certification mark. The examples of the certificates in the pictures below are of Level 1 for an individual and Level 3 for an organization. All the other certificates follow this format.

Example 1: TOP OPERATOR Remote Pilot, Level 1

1. The level to which you are certified and the kind of certification you have been awarded is under the certification mark.
2. The date the certification is awarded is on the bottom left.
3. Your unique TOP ID Number or certification identification number is under the date.
4. Your certification is valid for 24 months.
5. AUVSI will send you a reminder when the expiration date approaches.
6. Make sure to give your permission to be listed as a Remote Pilot in the AUVSI TOP Registry.



Example 2: TOP OPERATOR Service Provider, Level 3

1. The level to which you are certified and the kind of certification you have been awarded is under the certification mark.
2. The date the certification is awarded is on the bottom left.
3. Your unique TOP ID Number or certification identification number is under the date.
4. Your certification is valid for 24 months.
5. AUVSI will send you a reminder when the expiration date approaches.
6. Make sure to give your permission to be listed as a Service Provider in the AUVSI TOP Registry.



GOING GLOBAL

The Trusted Operator Program™ is a global program. The certification mark indicates the country and regulatory structure for which the certification was issued.

Pictured below, are the certification marks for Australia, Canada, Jamaica, Mexico, South Africa and the United Kingdom.



AUSTRALIA



CANADA



JAMAICA



MEXICO



SOUTH AFRICA



UNITED KINGDOM

For more information about international TOP Certification, please contact AUVSI.

HOW TO READ THIS MANUAL

Section two is the “heart” of the manual; this is the checklist of protocols. See the diagram below for a quick illustration of how to read the PCM. In section 2, you will find two columns on the right side.

The left column is the expanded protocol that the **Individual must satisfy = I**, the other column indicates that which the **Organization also has to satisfy = O**. Where the box has been blanked out, the protocol does not apply. As indicated in the diagram, an individual does not have to meet the requirements, however an organization does.

When both boxes are selected, in Level 1 protocols, individuals and organizations are evaluated differently; an individual will self-certify that they will follow the protocols, and provide evidence of their license, while an organization will declare that all their remote pilots have valid licenses, and self-certify they will support operations in accordance with the TOP PCM.

The Protocol **Area Title**

Column 1: **Identifier**

Column 2: **Protocol**

Column 3: **Credible Reference**

I. Management System Performance Measures for Level 1 TOP Operators				
The two check columns indicate either I = Individual or O = Organization				
	Regulatory Knowledge and Compliance	Reference	I	O
A	Operator has required license, certificate or permit to operate commercially within their state or country. Operator to provide copy of certification	Aviation Regulations Other Govt Regulations	☑	☑
B	Organizational / Management Structure and supporting documents	Aviation Regulations		☑
C	Operator has designated “Responsible Person” for all UAS operations	Aviation Regulations		☑
D	Operator has required operational approvals, exemptions and privileges and supporting documents	Aviation Regulations		☑
E	Operator has evidence of insurance coverage	Association Standard		☑
F	Operator provides evidence of UAS registration as required by the state or country, including the proper display of registration number	Aviation Regulations Other Govt Regulations		☑
G	Operator retains additional crew information including training and license details	Industry Standard		☑
H	Operator declares to apply Airmanship Principles, including, but not limited to: 1. Know your aircraft, the capabilities and limitations in normal and no normal scenarios 2. Know yourself, your limitations and personal habits that effect safety (rushing, impulsive, communication barriers, personal issues, financial issues) 3. Know your environment, the airspace, the weather, the operation 4. Know your team, conduct briefings, use your observers, communicate, be positive and resolve conflicts quickly and fairly (focus on system not person) 5. Know the risks, always conducts a thorough risk assessment 6. Stay proficient, practice and conduct ‘dry runs’ of complex operations, and scenario-based training for emergencies 7. Have the discipline to keep up to date on the latest safety and operational knowledge, including technical information regarding your platform 8. Do this to improve your situational awareness on every operation	Aviation Regulations Industry Best Practice	☑	☑
I	Operator declares they will remain in compliance with UAS Pilots code;	Industry Best Practice	☑	☑

CREDIBLE REFERENCE HIERARCHY (CRH)

The Credible Reference Hierarchy (CRH) table below illustrates the hierarchy of AUVSI-approved references based on their credibility. This table is to be used when assessing the applicable protocol elements contained in the expanded section two of the PCM.

The references are applicable to each country and state and provide a quick process for identifying compliance and conformity to the TOP PCM. Each candidate will provide a list of references they will use ahead of the proposed audit date to allow the certifying body to prepare for the audit.

Example: Specific Location Compliance Requirements

1. A remote pilot operating in the state of North Carolina, USA, requires a state government permit in addition to the FAR Part 107 license to operate legally
2. A remote pilot operating in a chemical plant will require HAZMAT certification to operate in compliance with the organizations regulation
3. A remote pilot operating commercial UAS in the United Kingdom must own and utilize a spectral analyzer prior to each operation to be complaint with UK CAA Cap 722
4. Some organizations in safety critical environments require workers including contractors to have a blood alcohol content (BAC) of 0.00 when reporting for duty; this is less than the FAA regulatory requirement of 0.04

If a reference does not appear in the Credible Reference Hierarchy, it must be referred to AUVSI for categorization and consideration as a possible addition.

CREDIBLE REFERENCE HIERARCHY

Aviation Regulations and Recommended Practices
(ICAO SARP, FAA AC's, etc.)

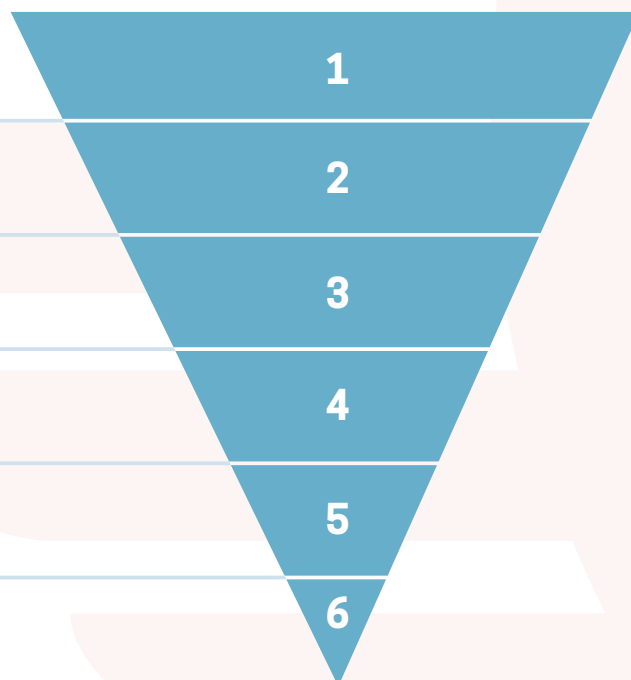
Local and State Regulations
(Agriculture, Occupational Health, Environment, etc.)

Accredited Industry Standards
(ISO and ANSI, etc.)

Association Standards
(AUVSI)

Recognized Industry Best Practices
(Public Safety, Defense, Utility, Petro, Aviation, etc.)

Guidance Material



CREDIBLE REFERENCE HIERARCHY WITH EXAMPLES

Ref Code	Reference Name	Reference Examples
Aviation Regulations	Aviation Regulations and Recommended Practices (ICAO SARP, FAA AC's, etc)	FAR Part 107 , FAA CFR Part 137, 14 CFR Part 119 - Certification: Air Carriers and Commercial Operators, CAA (UK) 772, CAA (S Africa) Part 101, ICAO RPAS Manual Doc 10019, ICAO Safety Management Manual Doc 9859, ICAO Training Organization Manual Doc 9841, CASA (AUS) 101, CASRs 101.335, CASR 1998, CAA (NZ) Part 102. FAA InFO 18001. Use of Reflective Vests by Small Unmanned Aircraft Systems (sUAS) Remote Pilots , FAA AC 107-2 - Small Unmanned Aircraft Systems (sUAS), FAA AC 137-1B - Certification Process for Agricultural Aircraft Operators, FAA Aeronautical Information Manual, FAA Airplane Flying Handbook FAA-H-8083-3B, FAA Aviation Instructors Handbook FAA-H-8083-9A, FAA Helicopter Flying Handbook FAA-H-8083-21A, FAA Flight Navigator Handbook FAA-H-8083018, FAA Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25B, FAA Risk Management Handbook FAA-H-8083-2, FAA System Safety Handbook, FAA Remote Pilot – Small Unmanned Aircraft Systems Study Guide FAA-G-8082-22, FAA Plane Sense FAA-H-8083-19A, ICAO UAS Toolkit
Other Government Regulations	Local and State Regulations (Agriculture, Occupational Health, Environment, etc)	OSHA ACT 1970, Endangered Species Act, Airborne Hunting Act, Marine Mammal Protection Act North Carolina Operator Permit, US DOJ Community Policing & Unmanned Aircraft Systems (UAS) Guidelines to Enhance Community Trust, Defense Contract Management Agency (DCMA) DCMA-INST 8210.2, DCMA Aviation Program Team Reference Book Volume I and II
Industry Standard	Accredited Industry Standards (ISO and ANSI, etc)	ASTM F3266 Standard Guide for Training for Remote Pilot in Command of Unmanned Aircraft Systems (UAS) Endorsement, ASTM F3298 Standard Specification for Design, Construction, and Verification of Fixed-Wing Unmanned Aircraft Systems (UAS), ASTM F2909 Standard Practice for Maintenance and Continued Airworthiness of Small Unmanned Aircraft Systems (sUAS), ASTM F2910 Standard Specification for Design and Construction of a Small Unmanned Aircraft System (sUAS), ASTM 3178 Standard Practice for Operational Risk Assessment of Small Unmanned Aircraft Systems (sUAS), Public safety remote pilots are certified in the incident command systems (ICS) or national incident management systems (NIMS) 100, 200, 300, 700, and 800 courses ASTM F3196 Standard Practice for Seeking Approval for Extended Visual Line of Sight (EVLOS) or Beyond Visual Line of Sight (BVLOS) Small Unmanned Aircraft System (sUAS) Operations, ASTM 2908 Standard Specification for Aircraft Flight Manual (AFM) for a Small Unmanned Aircraft System (sUAS), ASTM 3330 Specification for Training and the Development of Training Manuals for the Unmanned Aircraft Systems (UAS) Operator ASTM 3003 Standard Specification for Quality Assurance of a Small Unmanned Aircraft System (sUAS), SAE, IEEE, NFPA 1600 Standard on Disaster/ Emergency Management and Business Continuity/Continuity of Operations Programs, NFPA 1561 Standard on Emergency Services Incident Management System and Command Safety, NFPA 2400 Standard for Small Unmanned Aircraft Systems (sUAS) used for Public Safety Operations, ANSI/EMAP 1-2016 Urban Search and Rescue Standard , API General: Oil Field Equipment And Materials, Bull 2HINS Guidance for Post-Hurricane Structural Inspection of Offshore Structures, RP 2I In-Service Inspection of Mooring Hardware for Floating Structures, API RP 2N/ISO 19906:2010 Planning, Designing, and Constructing Structures and Pipelines for Arctic Conditions

Ref Code	Reference Name	Reference Examples
Association Standard	Association Standards (AUVSI)	AUVSI Air Boss checklist, AUVSI TOP PCM, AUVSI UAS Code of Conduct, AUVSI TOP Licensing Agreement
Industry Best Practice	Recognized Industry Best Practices (Public Safety, Defense, Utility, Petro, Aviation, etc)	UAS Pilot Code, UAViators Humanitarian UAV Code of Conduct, NATE small UAS Guide, APSA small UAS Resource Guide, PSAAC UAS Standard, Agricultural Remote Sensing Standards Council (AgARS Council), National Association of Aerial Applicators (NAAA), FEMA Info Bulletin 426 .Guidance to Recipients and Subrecipients of FEMA preparedness grants regarding the implementation of Executive Order 13809 Restoring State, Tribal, and Local Law Enforcement’s Access to Life-Saving Equipment and Resources, NTIA, US Army TC 1-600, FAA Wings Program, American Society of Photogrammetry and Remote Sensing (ASPRS). HAI, American Petroleum Institute (API) MANUAL OF PETROLEUM MEASUREMENT STANDARDS Chapter 17.1 Guidelines for Marine Inspection, API Chapter 17.8 Guidelines for Pre-Loading Inspection of Marine Vessel Cargo Tanks and Their Cargo-Handling Systems, API RP 4G Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures, API Inspection of Refinery Equipment. Public Safety Aviation Accreditation Commission (PSAAC) Standards for Public Safety Small Unmanned Aircraft System (sUAS) Programs. Flight Safety Foundation Basic Aviation Risk Standard- Remotely Pilot Aircraft (BARS-RPAS). International Association of Chiefs Of Police (IACP) Aviation Committee Recommended Guidelines for the use of Unmanned Aircraft, IACP Small Unmanned Aircraft Systems Model Policy, National Institute of Justice (NIJ) Considerations and Recommendations for Implementing an Unmanned Aircraft Systems (UAS) Program NCJ 250283, Manufacturer’s Manual, Textbook; Redefining airmanship, Kern, Tony (1997). McGraw-Hill Education (New York, USA), Darker Shades of The Rogue Pilot, Kern, Tony (1999) McGraw-Hill (New York, USA)
Guidance	Guidance Material	Manufacturer’s Manual, Textbook; Redefining airmanship, Kern, Tony (1997). McGraw-Hill Education (New York, USA), Darker Shades of The Rogue Pilot, Kern, Tony (1999) McGraw-Hill (New York, USA)

The CRH may be updated by AUVSI after consultation with the TOP Steering Committee through the Remote Pilots Council.

The TOP Steering Committee is convened by the AUVSI Chief Pilot in consultation with the TOP Chair, AUVSI Chapter Presidents, Remote Pilots Council, AUVSI members and appointed industry subject matter experts and regulators as appropriate.

For details on the TOP Steering Committee go to the AUVSI Remote Pilots Council website at auvsi.org.

CRITERIA FOR SUCCESS

To be certified in accordance with the TOP, an applicant must meet each of the applicable criteria within the appropriate elements of the TOP PCM, including applicable level of certification category. Here are some examples of how you can ensure that you are successful in your application.

Example 1: Successful Application – PCM Criterion

An applicant is required to meet the following PCM criterion:

“Operator provides evidence of UAS registration as required by the state or country, including the proper display of registration number”

You will note there are two requirements in the above; 1) evidence of registration, and 2) the proper display of that registration. To be successful, you will provide a list of all registration numbers and copies of the registration certificates issued by the state or country, and provide photographic evidence of the numbers displayed on the aircraft.

An unsuccessful applicant will have missing, expired or erroneous registration numbers, or be unable to provide the information when requested by the TOP Certifying Body.

Example 2: Successful Application – Flight Assessment

An applicant is required to complete a proficiency flight assessment; to meet TOP PCM criterion:

“Non-normal and emergency flight elements... Recognize and manage emergency and abnormal conditions.”

A successful applicant, as a remote pilot on the ground or in flight, will describe, recognize and react appropriately to any emergencies or abnormal condition, as described by the appropriate UAS flight manual, and in accordance with the applicable aviation regulation or an accredited industry standard.

An unsuccessful applicant, as a remote pilot on the ground or in flight, will not be able to identify, appropriately react to, or otherwise cope with any emergencies or abnormal conditions, as described by the appropriate UAS flight manual, and in accordance with the applicable aviation regulation or an accredited industry standard.

For more information about becoming TOP certified, please contact AUVSI.

..... **END OF SECTION 1**

SECTION 2

TOP LEVEL 1 – 3 EXPANDED PROTOCOLS

LEVEL 1 TOP OPERATORS



- A. To achieve Level 1 certification, training must have included the TOP Level 1 protocols
- B. Evidence of FAR Part 107 certification and training records containing these elements are to be submitted to the TOP training provider or the TOP Certifying Body
- C. The applicant will self-certify/declare in accordance with the requirements within the PCM through a TOP certifying body or TOP training provider

OPERATIONAL DESCRIPTION

- 1. Routine operations in accordance with FAR Part 107, or equivalent in other countries (open category EASA)
- 2. Operations that do not require a waiver of FAR Part 107 or equivalent in other countries
- 3. Operations in which the remote pilot is competent and proficient
- 4. Flights using electric aircraft less than 5 pounds or 2 kilograms
- 5. Operations that do not have any of the characteristics mentioned in Level 2 or 3
- 6. Safety Management System (SMS) complexity required: **LOW**

I. Management System Performance Measures for Level 1 TOP Operators				
The two check columns indicate either I = Individual or O = Organization				
	Regulatory Knowledge and Compliance	Reference	I	O
A	Operator has required license, certificate or permit to operate commercially within their state or country; operator to provide copy of certification	Aviation Regulations Other Govt Regulations	✓	✓
B	Organizational / Management Structure and supporting documents	Aviation Regulations		✓
C	Operator has designated "Responsible Person" for all UAS operations; a service provider with two or more workers must have two remote pilots, accountable for safety and training, certified as TOP Remote Pilots Level 1, or one TOP Remote Pilot Instructor Level 1 to maintain it's status as a TOP Certified Service Provider	Aviation Regulations		✓
D	Operator has required operational approvals, exemptions and privileges and supporting documents	Aviation Regulations		✓
E	Operator has evidence of insurance coverage	Association Standard		✓
F	Operator provides evidence of UAS registration as required by the state or country, including the proper display of registration number	Aviation Regulations Other Govt Regulations		✓
G	Operator retains additional crew information including training and license details	Industry Standard		✓
H	Operator declares they will apply Airmanship Principles, including, but not limited to: 1. Know your aircraft, the capabilities and limitations in normal and non-normal scenarios 2. Know yourself, your limitations and personal habits that effect safety (rushing, impulsive, communication barriers, personal issues, financial issues) 3. Know your environment, the airspace, the weather, the operation 4. Know your team, conduct briefings, use your observers, communicate, be positive and resolve conflicts quickly and fairly (focus on system not person) 5. Know the risks, always conducts a thorough risk assessment 6. Stay proficient, practice and conduct 'dry runs' of complex operations, and scenario-based training for emergencies 7. Keep up to date on the latest safety and operational knowledge, including technical information regarding your platform 8. Note errors and near misses to improve your situational awareness on every operation	Aviation Regulations Association Standards Industry Best Practice	✓	✓
I	Operator declares they will remain in compliance with AUVSI UAS Code of Conduct	Association Standards Industry Best Practice AUVSI UAS Code of Conduct	✓	✓

II. Operational Procedures Performance Measures for Level 1 TOP Operators

The two check columns indicate either I = Individual or O = Organization

	General Mission Planning Protocols	Reference	I	O
A	The operator indicates the use of standard operating procedures (SOPs) for: 1. Project feasibility and safety assessments 2. Pre-flight checklists 3. Non-normal scenarios and emergencies 4. Post-flight and pack up procedures	Aviation Regulations Other Govt Regulations Industry Standard		✓
B	The operator has indication of a safety management system	Aviation Regulations Other Govt Regulations Industry Standard		✓
C	The operator utilizes a risk management framework	Aviation Regulations Other Govt Regulations Industry Standard		✓
D	The operator has a work safety framework (occupational health and safety) that includes but is not limited to: 1. Fatigue, awareness and management 2. Dehydration awareness and prevention 3. Protection from elements (heat, cold, wind, sun) 4. Protection from interference and distraction from observers, public and wildlife (use of signage, bright jackets and barricades)	Aviation Regulations Other Govt Regulations Industry Standard		✓
E	The operator has documented roles and responsibilities, including, but not limited to: 1. Remote pilot responsibilities and qualifications 2. Observer responsibilities and qualifications	Aviation Regulations Other Govt Regulations Industry Standard		✓

III. Training Program Performance Protocols for Level 1 TOP Operators

The two check columns indicate either I = Individual or O = Organization

	The Operator's Remote Pilots have achieved competency in the following areas:	Reference	I	O
A	Air law applicable to the operational environment. Copies of waivers, approvals and certificates	Aviation Regulations Other Govt Regulations	✓	
B	UAS operation and general knowledge, including but not limited to: 1. Use and retention of the aircraft/original equipment manufacturer's handbook 2. Aircraft orientation and lighting 3. Effects of electromagnetic and frequency interference 4. Aircraft component care 5. Battery care, management, storage and transport	Aviation Regulations Industry Standard	✓	
C	The operator's remote pilots have demonstrated a knowledge of flight performance, planning and loading	Aviation Regulations Industry Standard	✓	
D	The operator's remote pilots have demonstrated proficiency in UAS meteorology theory, including, but not limited to: 1. Considering effects of wind, precipitation, altitude, and temperature on battery life, performance, and controllability 2. Know conditions that produce airframe icing, and effect on performance	Aviation Regulations Industry Standard	✓	
E	The operator's remote pilot has demonstrated proficiency in UAS navigation theory, including, but not limited to: 1. Accuracy limitations of GPS 2. Use of smart applications	Aviation Regulations Industry Standard	✓	
F	The operator's remote pilot has documented operational procedures appropriate for their commercial operations	Aviation Regulations Industry Standard	✓	
G	The operator's remote pilot has demonstrated knowledge of the principles of flight	Aviation Regulations Industry Standard	✓	

III. Training Program Performance Protocols for Level 1 TOP Operators (cont'd)

The two check columns indicate either I = Individual or O = Organization

	The Operator's Remote Pilots have achieved competency in the following areas:	Reference	I	O
H	The operator's remote pilot has completed education in human performance and UAS evidence of training course should include human centric threats and errors and the impact on UAS operations; including, but not limited to: 1. Time pressure, 2. Commercial pressure 3. Personal pressures	Aviation Regulations Industry Standard	<input checked="" type="checkbox"/>	
I	The operator has a method for remote pilots to stay proficient (practice schedule)	Industry Standard		<input checked="" type="checkbox"/>
J	The operator has a proficiency / recurrent schedule appropriate for their operations	Industry Standard		<input checked="" type="checkbox"/>

IV. Maintenance and Inspection Program Performance Measures for Level 1 TOP Operators

The two check columns indicate either I = Individual or O = Organization

		Reference	I	O
A	The operator has a self-certifying statement of compliance with the maintenance and inspection program	Aviation Regulations Other Govt Regulations Industry Standard		<input checked="" type="checkbox"/>
B	The operator has retained the manufacturer's instructions and system documentation for the UAS	Aviation Regulations Other Govt Regulations Industry Standard		<input checked="" type="checkbox"/>
C	The operator keeps individual aircraft flight log	Aviation Regulations Other Govt Regulations Industry Standard		<input checked="" type="checkbox"/>
D	The operator keeps maintenance and repair log for each UAS	Aviation Regulations Other Govt Regulations Industry Standard		<input checked="" type="checkbox"/>
E	The operator keeps battery usage log	Aviation Regulations Other Govt Regulations Industry Standard		<input checked="" type="checkbox"/>

V. Safety Management System Performance Measures for Level 1 TOP Operators

The two check columns indicate either I = Individual or O = Organization

	Understanding Safety Management	Reference	I	O
A	The operator has a safety policy	Aviation Regulations Other Govt Regulations Industry Standard		<input checked="" type="checkbox"/>
B	The operator has appropriate safety equipment for the type of operations	Aviation Regulations Other Govt Regulations Industry Standard		<input checked="" type="checkbox"/>
C	The operator has a system to ensure access to safety equipment	Aviation Regulations Other Govt Regulations Industry Standard		<input checked="" type="checkbox"/>
D	The operator conducts job safety assessment for every flight	Aviation Regulations Other Govt Regulations Industry Standard		<input checked="" type="checkbox"/>

V. Safety Management System Performance Measures for Level 1 TOP Operators (cont'd)

The two check columns indicate either I = Individual or O = Organization

Understanding Safety Management		Reference	I	O
E	The operator maintains a safety log of potential hazards	Aviation Regulations Other Govt Regulations Industry Standard		✓
F	The operator has an emergency response plan	Aviation Regulations Other Govt Regulations Industry Standard		✓
	Accident and incident reporting	Aviation Regulations Other Govt Regulations Industry Standard		✓
Accident and Incident Reporting		Reference	I	O
G	Operator records all accidents and incidents	Aviation Regulations Other Govt Regulations Industry Standard		✓
H	Operator has a system in place to support reporting of accidents and incidents	Aviation Regulations Other Govt Regulations Industry Standard		✓
I	Operator has a safety training program	Aviation Regulations Other Govt Regulations Industry Standard		✓

LEVEL 2

TOP OPERATORS



- A. Applicants must meet all Level 1 protocols.
- B. Training records must indicate successful completion of all protocols in accordance with Level 2 (individuals)
- C. Training records must be submitted and validated by a TOP training organization or TOP Certifying Body (individuals)
- D. The applicant must have successfully passed the flight assessment in accordance with the PCM (individuals)

OPERATIONAL DESCRIPTION

1. Operations that require FAA waivers or approvals (in the U.S.)
2. Operations under the “specific” category, as defined by EASA
3. Aerial work as defined by FAA CFR Part 119.1(e)(4)
4. Operations with elevated risk factors
5. Operations at night
6. Operations that involve the requirement for visual observers or an Air Boss
7. SMS complexity required: **MEDIUM**

I. Management System Performance Measures for Level 2 TOP Operators				
The two check columns indicate either I = Individual or O = Organization				
	Regulatory Knowledge and Compliance	Reference	I	O
A	The operator has required license, certificate or permit to operate commercially within their state or country The operator certification must be valid and available to be verified when required by the authority holding jurisdiction	Aviation Regulations Other Govt Regulations	✓	✓
B	Operational approvals, exemptions and privileges and supporting documents are to be valid and available to be verified	Aviation Regulations		✓
C	The operator must have organizational / management structure incorporated into an operations manual or equivalent like document	Aviation Regulations Industry Standard		✓
D	Roles and responsibilities as appropriate 1. CEO / senior manager / key accountable person responsibilities and qualifications (as it relates to safety and quality) 2. Chief pilot responsibilities and qualifications 3. Head of training responsibilities and qualifications 4. Flight instructor responsibilities and qualifications (minimum TOP Level 2) 5. Safety manager responsibilities and qualifications 6. Air Boss designation, responsibilities and qualifications 7. Remote pilot responsibilities and qualifications (minimum TOP Level 1) 8. Observer and/or other crew responsibilities and qualifications	Aviation Regulations		✓
E	A service provider with two or more workers must have two remote pilots accountable for safety and training, certified as TOP Remote Pilots Level 2 or one TOP Remote Pilot Instructor Level 2, to maintain its status as a TOP Certified service provider	Other Govt Regulations Industry Standard		✓
F	The operator must have an appointed chief pilot to provide oversight to all operations	Association Standard		✓
G	The operator must have appointed safety manager role (can be same individual as the chief pilot)	Aviation Regulations Other Govt Regulations		✓

II. Operational Procedures Performance Measures for Level 2 TOP Operators

The two check columns indicate either I = Individual or O = Organization

	In addition to meeting TOP Level 1 protocols, the operator must have the following general mission planning protocols:	Reference	I	O
A	The operator utilizes well-developed and documented standard operating procedures (SOPs) and checklists for: 1. Project feasibility and accountability outlines 2. Confirmation of crew qualifications and proficiency for task 3. Risk assessment and job safety assessments per task 4. Occupational safety and health protocols including fatigue policy 5. Pre-mission procedures and checklists (including equipment, personnel) 6. Pre-flight procedures 7. Non-normal and emergency procedures 8. Emergency Response Plan documented, accessible and briefed 9. Post flight and pack up protocols documented and practiced	Aviation Regulations Other Govt Regulations Industry Standard		✓
B	Occupational health and safety operator has documented procedures to comply with provisions of work safety. Occupational health and safety framework appropriate to the operation	Aviation Regulations Other Govt Regulations Industry Standard		✓
C	The operator has personal protective equipment (PPE) appropriate to the operation's emergency response provisions	Aviation Regulations Other Govt Regulations Industry Standard		✓
D	The operator keeps copies of required documentation on flight task site; flight manual, licenses, approvals, waivers, emergency response protocols	Aviation Regulations Other Govt Regulations Industry Standard		✓
	Quality Assurance and Documentation	Reference	I	O
E	The operator has a quality assurance program that includes, but is not limited to, methods that ensure version control of: 1. The operator maintains individual aircraft flight logs 2. The operator maintains individual aircraft maintenance logs 3. The operator maintains software/ malware update logs for each aircraft 4. The operator maintains remote pilot flight records 5. The operator maintains remote pilot and observer training and proficiency records	Aviation Regulations Other Govt Regulations Industry Standard		✓
F	The operator provides evidence of level-appropriate aviation insurance for their operations	Aviation Regulations Other Govt Regulations Industry Standard		✓
G	Role of the Air Boss: 1. The operator has appropriate guidelines for use of an Air Boss 2. The operator has qualification minimums for use of the Air Boss 3. The operator has standard operating procedures and checklist for an Air Boss	Aviation Regulations Other Govt Regulations Industry Standard		✓

III. Training Program Performance Protocols for Level 2 TOP Operators

The two check columns indicate either I = Individual or O = Organization

	In addition to meeting TOP Level 1 protocols, the operator's remote pilots must demonstrate competency in the following areas:	Reference	I	O
A	The operator's remote pilots have completed education in air law and have a documented process by which waivers, approvals and permissions are attained, recorded and maintained to ensure compliance	Aviation Regulations Other Govt Regulations	✓	
B	The operator's remote pilots have completed education in meteorology and environmental elements, including, but not limited to: 1. Effects of wind in complex operational environments 2. Environmental limitations on aircraft and consequences of exceedance 3. Airframe icing conditions and effect on performance procedures to mitigate 4. Visual line of sight (VLOS) limitations (sun glare, visual illusions, slant distance, altitude etc.)	Aviation Regulations Industry Standard	✓	

III. Training Program Performance Protocols for Level 2 TOP Operators (cont'd)

The two check columns indicate either I = Individual or O = Organization

	In addition to meeting TOP Level 1 protocols, the operator's remote pilots must demonstrate competency in the following areas:	Reference	I	O
C	The operator's remote pilots have completed education in UAS navigation elements, including, but not limited to: 1. Aviation chart knowledge and use 2. Use of NOTAM and TFR 3. Use of aviation frequencies (NAV) 4. Use of aviation radio (listening watch) 5. Accuracy limitations of GPS, WiFi, satellite (other systems used) 6. Use of smart applications 7. Operations in close proximity to heliports, and airports 8. Operations in close proximity to critical infrastructure / high value structures	Aviation Regulations Other Govt Regulations Industry Standard	<input checked="" type="checkbox"/>	
D	The operator keeps copies of required documentation on flight task site; flight manual, licenses, approvals, waivers, emergency response protocols	Aviation Regulations Industry Standard	<input checked="" type="checkbox"/>	
E	Evidence of human factors training should support the following, but not limited to: 1. Human centric threats and errors (FAA Dirty Dozen) and UAS specific human threats such as distraction, boredom and pilot interference 2. Tools to combat human centric threats (time pressure, commercial pressure, personal pressures and personal protective equipment) 3. Guidelines and tools to avoid fatigue and dehydration 4. Guidance on alcohol and drugs prior to or during operations 5. Drug and alcohol testing program	Aviation Regulations Industry Standard	<input checked="" type="checkbox"/>	
	Training Department or Remote Pilot Instructor provides evidence of systems to support training in the following areas:	Reference	I	O
F	The operator's remote pilot instructors have completed education in teaching airmanship principles	Aviation Regulations Industry Standard	<input checked="" type="checkbox"/>	
G	The operator's remote pilot instructors have completed instructing principles, including, but not limited to: 1. Teaching process principles 2. Construct UAS lesson plans 3. Conduct UAS assessments 4. Flight log management 5. Training record management	Aviation Regulations Industry Standard	<input checked="" type="checkbox"/>	
H	The operator utilizes a well-developed and documented training manual for UAS operations during training, including but not limited to: 1. Use and application of operations manual, safety manual, maintenance manual as applicable 2. Use of the aircraft manufacturer's handbook 3. Aircraft handling in flight, limitations, effects of environment 4. Aircraft handling in emergencies (ground-based and air based) 5. Effects of electromagnetic and frequency interference 6. Use of spectrum integrity checks (spectral analyzers or 'apps') 7. Use of geofencing 8. Awareness and use of privacy and security systems (encryption etc.) 9. Aircraft component care, pilot approved maintenance 10. Battery types and hazards 11. Battery tracking systems, (care, management, storage and transport)	Aviation Regulations Other Govt Regulations Industry Standard		<input checked="" type="checkbox"/>
I	The operator has procedures for assuring normal operations during training, including but not limited to: 1. Flight performance and loading 2. Flight planning 3. Contingency planning (off nominal non-emergency situations)	Industry Standard		<input checked="" type="checkbox"/>

J	<p>Documented training procedures for the following, including but not limited to:</p> <ol style="list-style-type: none"> 1. Commercial operations 2. Training (instructing) and testing 3. Proficiency / recurrence requirements 4. Preflight procedures for all aircraft types (including checklists) 5. Procedures for flight planning for operational environments 6. A system where all normal procedures and contingencies are documented (including checklists) 7. Emergency response plan including quick reference checklists 8. Hand over / take over procedures are documented 9. Navigation tolerances and operations around airports are applied 10. Post flight procedures (checklists) 11. A method to stay proficient (practice schedule) 12. The operator has a proficiency / recurrent schedule appropriate for their operations 	<p>Aviation Regulations Industry Standard</p>		✓
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IV. Maintenance and Inspection Program Performance Measures for Level 2 TOP Operators

The two check columns indicate either I = Individual or O = Organization

	The operator must meet TOP Level 1 Protocols	Reference	I	O
A	The operator has retained manufacturer's instructions and system documentation for the UAS used	Aviation Regulations Other Govt Regulations Industry Standard		✓
B	The operator has a General Maintenance Manual (GMM)	Aviation Regulations Other Govt Regulations Industry Standard		✓
C	The operator keeps maintenance, alteration and repair logs for each UAS	Aviation Regulations Other Govt Regulations Industry Standard		✓
D	The operator keeps individual aircraft log	Aviation Regulations Other Govt Regulations Industry Standard		✓
E	The operator keeps software / malware update log	Aviation Regulations Other Govt Regulations Industry Standard		✓
F	<p>The operator has a system to track the following aircraft components:</p> <ol style="list-style-type: none"> 1. Genuine and non-genuine parts 2. Defective parts log 3. Replacement and spare parts 	Aviation Regulations Other Govt Regulations Industry Standard		✓
G	The operator has a designated list of personnel who are permitted to maintain the aircraft	Aviation Regulations Other Govt Regulations Industry Standard		✓
H	The operator has a process to train designated personnel who are permitted to maintain and inspect the aircraft	Aviation Regulations Other Govt Regulations Industry Standard		✓

V. Safety Management System Performance Measures for Level 2 TOP Operators

The two check columns indicate either I = Individual or O = Organization

	Understanding Safety Management	Reference	I	O
A	<ol style="list-style-type: none"> Operator has a safety policy Operator has appropriate safety equipment Operator conducts job safety assessment for every flight in accordance with industry standard Operator maintains safety records in accordance with industry standards Operator has a method to identify and manage risk Operator has an emergency response plan and tests it in accordance with industry standards and best practices 	Aviation Regulations Other Govt Regulations Industry Standard		✓
B	The operator conducts and documents job safety assessment for every flight	Aviation Regulations Other Govt Regulations Industry Standard		✓
C	The operator maintains safety assessments for hazard tracking	Aviation Regulations Other Govt Regulations Industry Standard		✓
D	The operator maintains a master hazard and risk register	Aviation Regulations Other Govt Regulations Industry Standard		✓
E	The operator keeps a safety document library of the components mentioned in A, B, C and D to facilitate version control (i.e. relevant Material Safety Data Sheets)	Aviation Regulations Other Govt Regulations Industry Standard		✓
F	The operator has appropriate safety equipment, including but not limited to: <ol style="list-style-type: none"> Evidence that the equipment is available at both base and off base operations Equipment is appropriate for operational tasks and identified hazards Equipment is in good condition, within validity dates and operational 	Aviation Regulations Other Govt Regulations Industry Standard		✓
	Emergency Response Planning (ERP)	Reference	I	O
G	The operator has a documented emergency response plan appropriate for each type of operation conducted available at both base and off-base locations	Aviation Regulations Other Govt Regulations Industry Standard		✓
H	The operator has supporting quick reference checklists (QRCs) for each ERP	Aviation Regulations Other Govt Regulations Industry Standard		✓
I	The operator has contact numbers and persons on those QRCs or another source	Aviation Regulations Other Govt Regulations Industry Standard		✓
J	The operator tests ERP once per year (self-declaration)	Aviation Regulations Other Govt Regulations Industry Standard		✓
K	The operator provides briefing and training on appropriate ERP to crew	Aviation Regulations Other Govt Regulations Industry Standard		✓
	Safety Reporting	Reference	I	O
L	The operator has a system to report safety hazards and risks both anonymously and open	Aviation Regulations Other Govt Regulations Industry Standard		✓
M	The operator has a "just culture" statement and philosophy for safety reporting	Aviation Regulations Other Govt Regulations Industry Standard		✓

	Accident and Incident Reporting	Reference	I	O
N	The operator has a documented system for accident and incident reports	Aviation Regulations Other Govt Regulations Industry Standard		✓
O	The operator has a documented illustration of what needs to be reported to the Civil Aviation Authority (CAA) and within appropriate time frames	Aviation Regulations Other Govt Regulations Industry Standard		✓
P	The operator retains reports for continual safety improvement	Aviation Regulations Other Govt Regulations Industry Standard		✓

VI. Practical Flight Assessment for Level 2 TOP Operators

The two check columns indicate either I = Individual or O = Organization

	Remote Pilots	Reference	I	O
A	Operator's remote pilots must demonstrate competency in the following ground elements including but not limited to: 1. Attain all required permissions, permits and waivers, and ensure that they remain valid 2. Must operate within regulatory framework of mission/approvals etc. 3. Accurately complete all required checklists 4. Follow standard operating procedures in accordance with the flight being undertaken 5. Adhere to manufacturer's operating instructions 6. Accurately complete all aircraft and system checks 7. Ensure safety briefings are delivered to appropriate crew and or observers prior to flight 8. Monitor the airspace prior to and during entire flight 9. Use effective communication (professional aviation style language) prior and during operation	Aviation Regulations Other Govt Regulations Industry Standard	✓	
B	Operator's remote pilots must demonstrate competency in the following normal, abnormal and emergency flight elements including, but not limited to: 1. Recognize and manage emergency and abnormal conditions 2. Remotely pilot the UAS within its limitations imposed by regulation 3. Complete all maneuvers with smoothness and accuracy, as defined by industry standard 4. Exercise good judgment and airmanship 5. Apply aeronautical knowledge 6. Maintain control of the UAS at all times in a manner such that the successful outcome of a maneuver is assured 7. Recognize and manage emergency and abnormal conditions	Aviation Regulations Other Govt Regulations Industry Standard	✓	
	Remote Pilot Instructors	Reference	I	O
C	Remote pilot instructors must deliver instruction on: 1. All ground elements 2. Specified elements from normal flight elements and emergency and non-normal elements	Aviation Regulations Other Govt Regulations Industry Standard	✓	

LEVEL 3

TOP OPERATORS



- A. Applicants must meet all Level 2 protocols
- B. Training records must indicate successful completion of all protocols in accordance with Level 3 (individuals)
- C. Training records must be submitted and validated by a TOP training organization or TOP Certifying Body (individuals)
- D. The applicant must have successfully passed the flight assessment in accordance with the PCM (individuals)

OPERATIONAL DESCRIPTION

1. Operations which require multiple Part 107 waivers; i.e. BVLOS, flights over people, flights at night (in the U.S.)
2. Operations categorized as group 3 risk by JO 8130.34D (in the U.S.)
3. Operations under the “certified” category, as defined by EASA
4. Critical and non-critical infrastructure inspections and industrial sites
5. Operations near persons or high-value livestock (i.e. endangered species); 100 ft. is considered acceptable distance
6. Operations in toxic, noxious, flammable or explosive environments
7. All drone operations on offshore platforms ¹
8. All counter-UAS, and other operations in and around aircraft landing areas
9. A UAS greater than 55lbs
10. SMS complexity required: **HIGH**

I. Management System Performance Measures for Level 3 TOP Operators				
The two check columns indicate either I = Individual or O = Organization				
	Regulatory Knowledge and Compliance	Reference	I	O
A	The operator has required license, certificate or permit to operate commercially within their state or country. 1. The operator certification must be validated when required by the authority holding jurisdiction 2. The operator must provide evidence of method to ensure compliance validity	Aviation Regulations Other Govt Regulations Industry Standard	✓	✓
B	Operational approvals, exemptions, privileges and supporting documents 1. Documentation must be validated 2. The operator must provide evidence of method to ensure compliance and validity.	Aviation Regulations Other Govt Regulations Industry Standard		✓
C	The operator must have organizational/management structure incorporated into an Operations Manual (OM)	Aviation Regulations Other Govt Regulations Industry Standard		✓
D	Roles and responsibilities as appropriate: 1. CEO/senior manager/key accountable person responsibilities and qualifications (as it relates to safety and quality) 2. Chief pilot responsibilities and qualifications 3. Head of training responsibilities and qualifications 4. Flight instructor(s) responsibilities and qualifications (minimum TOP Level 3) 5. Safety manager responsibilities and qualifications 6. Air Boss designation, responsibilities and qualifications 7. Remote pilot responsibilities and qualifications (minimum TOP Level 1) 8. Observer and/or other crew responsibilities and qualifications	Aviation Regulations Other Govt Regulations Industry Standard		✓
E	A service provider with two or more workers must have two remote pilots accountable for safety and training, certified as TOP Remote Pilots Level 3 or one TOP Remote Pilot Instructor Level 3, to maintain its status as a TOP Certified service provider	Other Govt Regulations Industry Standard		✓

1. All TOP operations on industrial sites and off-shore installations must include annotations to refer to and apply the site-specific OSHA, HAZMAT and other relevant (non-UAS) Industry Standards.

	Regulatory Knowledge and Compliance	Reference	I	O
F	The operator must have an appointed chief pilot to provide oversight to all operations	Aviation Regulations Other Govt Regulations Industry Standard		✓
G	The operator must have appointed safety manager role	Aviation Regulations Other Govt Regulations Industry Standard		✓
H	The operator must have an appointed head of training to provide oversight on all training. Organizations must have at least two key accountable personnel certified as TOP Level 3 to hold out as a TOP Organization	Aviation Regulations Other Govt Regulations Industry Standard		✓
I	The operator must have appointed head of maintenance to provide oversight for all maintenance and continued airworthiness activities. Organizations must have at least two key accountable personnel certified as TOP Level 3 to hold out as a TOP Organization	Aviation Regulations Other Govt Regulations Industry Standard		✓
J	Aviation and other insurance: 1. Appropriate for all UAS operations, at all locations 2. Additional insurance as required by any stakeholders or third parties	Aviation Regulations Other Govt Regulations Industry Standard		✓

II. Operational Performance Measures for Level 3 TOP Operators

The two check columns indicate either I = Individual or O = Organization

	The Operator Must Meet TOP Level 2 Protocols	Reference	I	O
A	Complete operations manual appropriate for organization size and complexity, including: 1. Containing controlled version numbers and dates 2. Record of revisions 3. Record of crew read receipt and agreement	Aviation Regulations Other Govt Regulations Industry Standard		✓
	General Mission Planning Protocols	Reference	I	O
B	Operator utilizes well-developed and documented standard operating procedures (SOPs) and checklists, including, but not limited to: 1. Project feasibility and accountability outlines (responsibilities, permissions and approvals, etc.) 2. Confirmation of crew qualifications and proficiency for task 3. Risk assessment and job safety assessments per task 4. Occupational safety and health protocols including fatigue policy 5. Pre-mission procedures and checklists (including equipment, personnel) 6. Pre-flight procedures (aircraft, environment, individuals, and equipment) 7. Non-normal and emergencies procedures 8. Emergency response plan documented, accessible and briefed 9. Post-flight and pack up protocols documented and practiced	Aviation Regulations Other Govt Regulations Industry Standard		✓
C	Operating crew records: 1. Remote pilot flight and duty time records (daily flight records) 2. Remote pilot training and qualification records 3. Remote pilot crew (including observers) proficiency records	Aviation Regulations Other Govt Regulations Industry Standard		✓
D	Operator has a quality assurance program (document library) 1. All operational documents are to contain version numbers and dates 2. Operator must have a system to ensure operational documentation is current and valid and updated as necessary (this includes crew files, certificates, etc.)	Aviation Regulations Other Govt Regulations Industry Standard		✓
E	Documentation: 1. Operator has copies of required documentation on flight task site 2. Operator has copies of flight and operational manuals 3. Operator has licenses/certificates/waivers/approvals 4. Operator has entry/transit or other property permissions 5. Operator has emergency response protocols, QRCs, contact details etc. 6. Operator has third-party certification of UAS (CAA, Original Equipment Manufacturer, FAA DAR or other)	Aviation Regulations Other Govt Regulations Industry Standard		✓

III. Training Program Performance Protocols for Level 3 TOP Operators

The two check columns indicate either I = Individual or O = Organization

	In addition to meeting TOP Level 2 protocols, the operator's remote pilots must demonstrate competency in the following areas:	Reference	I	O
A	The operator's remote pilots have general theoretical knowledge of the following areas: 1. Air law 2. UAS general knowledge 3. Flight performance, planning and loading 4. Meteorology 5. Navigation 6. Operational procedures 7. Principles of flight	Aviation Regulations Other Govt Regulations Industry Standard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B	The operator's remote pilots have expanded theoretical knowledge of the following areas: 1. Use of spectrum analyzers 2. Basic first aid 3. Operations around aerodromes and airports 4. Radiotelephony	Aviation Regulations Other Govt Regulations Industry Standard	<input checked="" type="checkbox"/>	
C	The operator's remote pilots have expanded theoretical knowledge of human performance and UAS. The remote pilot will: 1. Recognize and manage threats and errors 2. Display crew resource management	Aviation Regulations Other Govt Regulations Industry Standard	<input checked="" type="checkbox"/>	
D	The operator's remote pilots have expanded theoretical knowledge of airmanship principles. The remote pilot will: 1. Exercise good judgment and airmanship 2. Operate the UAS with limitations or those imposed by regulations 3. Apply aeronautical knowledge 4. Participate in professional development programs	Aviation Regulations Other Govt Regulations Industry Standard	<input checked="" type="checkbox"/>	
E	The operator's remote pilots have expanded theoretical knowledge of skill, proficiency and roles in the following: 1. Preflight operations 2. Flight planning 3. Normal procedures 4. Abnormal and emergency procedures 5. Navigation 6. Post flight procedures	Aviation Regulations Other Govt Regulations Industry Standard	<input checked="" type="checkbox"/>	
F	The operator's Air Bosses have knowledge of guidelines for qualifications of the Air Boss: 1. When an Air Boss is needed 2. Standard check lists for the Air Boss 3. Communications with the Air Boss 4. Air Boss checklist 5. Emergency response plans 6. Considerations for minimum equipment 7. Third party responsibility and interaction 8. Air Boss log and record keeping	Aviation Regulations Other Govt Regulations Industry Standard	<input checked="" type="checkbox"/>	
	Training Department or Remote Pilot Instructor provides evidence of systems to support training in the following areas:	Reference	I	O
G	The operator's remote pilot instructors have expanded theoretical knowledge of the principles of basic instructional teaching principles – directly demonstrate and monitor construct: 1. How to conduct an assessment 2. Keeping flight training records 3. Training follow up and reporting	Aviation Regulations Other Govt Regulations Industry Standard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
H	The operator's remote pilots have expanded theoretical knowledge of skill, proficiency and testing elements: 1. Guidance on practice intervals 2. Types of elements to include in practice 3. Elements to include in assessments 4. What to record on proficiency checks	Aviation Regulations Other Govt Regulations Industry Standard	<input checked="" type="checkbox"/>	

IV. Maintenance and Inspection Performance Measures for Level 3 TOP Operators

The two check columns indicate either I = Individual or O = Organization

	The Operator Must Meet TOP Level 2 Protocols:	Reference	I	O
A	Statement of compliance with maintenance and inspection program	Aviation Regulations Other Govt Regulations Industry Standard		✓
B	1. The operator has retained manufacturer's instructions and system documentation for the UAS used 2. The operator has a method to ensure Original Equipment Manufacturer manual is updated and current	Aviation Regulations Other Govt Regulations Industry Standard		✓
C	The operator has a General Maintenance Manual (GMM), may include operator's OMM	Aviation Regulations Other Govt Regulations Industry Standard		✓
D	The operator keeps maintenance and repair log for each UAS	Aviation Regulations Other Govt Regulations Industry Standard		✓
E	The operator keeps individual aircraft flight logs	Aviation Regulations Other Govt Regulations Industry Standard		✓
F	The operator keeps software / malware update logs	Aviation Regulations Other Govt Regulations Industry Standard		✓
G	The operator has a system (part log) to track the following aircraft components: 1. Genuine and non-genuine parts 2. Defective parts log 3. Replacement and spare parts	Aviation Regulations Other Govt Regulations Industry Standard		✓
H	The operator has designated list of personnel who are permitted to maintain aircraft	Aviation Regulations Other Govt Regulations Industry Standard		✓
I	The operator has process to train designated personnel who are permitted to maintain and inspect aircraft	Aviation Regulations Other Govt Regulations Industry Standard		✓
J	Dedicated operator's maintenance manual (OMM) in addition to manufacturers' manual. This OMM shall include, but is not limited to: 1. Provision to maintain individual aircraft flight logs 2. Crash / accident and incident log 3. Software update log 4. Battery cycle log 5. Parts log 6. List of pilots approved maintenance 7. Minimum Equipment Lists (MEL) 8. Controlled Deviation Lists (CDL)	Aviation Regulations Other Govt Regulations Industry Standard		✓

V. Safety Management System Performance Measures for Level 3 TOP Operators

The two check columns indicate either I = Individual or O = Organization

	The Operator Must Meet TOP Level 2 Protocols:	Reference	I	O
A	The operator has a safety management manual (or dedicated section of operations manual devoted to safety), including but not limited to: 1. Safety policy 2. Management commitment and responsibility 3. Safety accountabilities 4. Dedicated safety manager role and responsibility 5. Safety committee (role and responsibilities if applicable) 6. Safety meetings schedule 7. Safety reporting process (documents) 8. Policy for continual improvement and change management 9. Documents for risk and hazard identification ...continued on next page	Aviation Regulations Other Govt Regulations Industry Standard		✓

V. Safety Management System Performance Measures for Level 3 TOP Operators (cont'd)

The two check columns indicate either I = Individual or O = Organization

A	10. Process for identifying and recording risks and hazards and timeframe	Aviation Regulations Other Govt Regulations Industry Standard		
	11. Policy and process for tracking safety performance			
	12. Emergency response plan			
	13. Safety performance monitoring			
	14. Change management protocols			
	15. Continuous improvement strategies			
	16. Safety training and education			
B	17. Safety communication			
	Accident and incident reporting			
	1. Operator records accidents and incidents in accordance with industry standards	Aviation Regulations Other Govt Regulations Industry Standard		

VI. Practical Flight Assessment for Level 3 TOP Operators

The two check columns indicate either I = Individual or O = Organization

	Remote Pilots	Reference	I	O
A	The operator's remote pilots must demonstrate competency in the following ground elements, including but not limited to:	Aviation Regulations Other Govt Regulations Industry Standard		
	1. Attain all required permissions, permits, waivers, and ensure they are valid			
	2. Operate within the regulatory framework of mission/approvals etc.			
	3. Accurately complete all required checklists			
	4. Company Standard Operating Procedures are followed			
	5. Demonstrate adherence to manufacturer's operating instructions			
	6. Aircraft and system checks, and tests are completed accurately			
	7. Safety brief is delivered to appropriate crew prior to flight			
	8. Airspace is monitored prior to and during entire flight			
B	9. Effective communication is used (professional language) prior and during operation	Aviation Regulations Other Govt Regulations Industry Standard		
	The operator's remote pilots must demonstrate competency in the following normal, abnormal and emergency flight elements, including, but not limited to:			
	1. Recognize and manage emergency and abnormal conditions			
	2. Remotely pilot the UAS within limitations imposed by regulation			
	3. Complete all maneuvers with smoothness and accuracy, as defined by industry standard			
	4. Exercise good judgment and airmanship			
	5. Apply aeronautical knowledge			
	6. Maintain control of the UAS at all times in a manner such that the successful outcome of a maneuver is assured			
	7. Recognize and manage emergency and abnormal conditions			
	Remote Pilot Instructors	Reference	I	O
C	The operator's remote pilot instructors must deliver instruction on:	Aviation Regulations Other Govt Regulations Industry Standard		
	1. All ground elements			
	2. Specified elements from normal flight and emergency and non-normal elements			
	3. All ground and specified elements from normal flight elements and emergency and non-normal elements			

..... **END OF SECTION 2**



SECTION 3

FUNCTIONAL AREAS

FUNCTIONAL AREA CERTIFICATION GUIDANCE FOR UAS SERVICE PROVIDERS

This section is an additional guide for certifying UAS operators who offer services in specific UAS operational areas. Unlike the other protocols in Section 2, TOP functional area protocols apply to the organization, except for the flight assessment, which applies to the individual.

Organizations and individuals who achieve TOP Level 2 and 3 certifications in these areas have demonstrated specific areas of knowledge, system performance, risk-management and competencies related to these industries.

The TOP certificate awarded to applicants who complete requirements in the functional areas of this guide will have the details annotated on their certificate. Training Providers must be certified in the functional area to award certification in that area.

These functional area will be covered:

1. Agriculture
2. Environmental Services
3. Infrastructure and Utility Inspections
4. Petroleum, Oil and Gas Inspections
5. Public Safety
6. Training Providers

UAS OPERATIONS IN AGRICULTURE

Functional Area Protocols for Level 3 TOP Agricultural Remote Pilots		Required
I.	Management System	✓
II.	Operational Procedures	
III.	Training Program	✓
IV.	Maintenance and Inspection Program	
V.	Safety Management System	
VI.	Practical UAS Flight Assessment	✓

Functional Area Protocols for Level 3 TOP Agricultural Service Providers		Required
I.	Management System*	✓
II.	Operational Procedures	✓
III.	Training Program	✓
IV.	Maintenance and Inspection Program	✓
V.	Safety Management System	✓
VI.	Practical UAS Flight Assessment	

*A TOP service provider must maintain two TOP certified key remote pilots or one TOP certified instructor to maintain their status as a TOP agricultural service provider.

Functional Area Performance Measures for Agricultural Operators

The two check columns indicate either I = Individual or O = Organization

I. Management System		Reference	I	O
A	Aerial applicators must comply with federal, state and local regulations regarding air space, pesticides, and other materials	Aviation Regulations Other Govt Regulations Industry Standard	✓	✓
II. Operational Procedures		Reference	I	O
A	<p>The operator utilizes well developed and documented standard operating procedures (SOPs) and checklists for specific industry-sector operations, including but not limited to:</p> <ol style="list-style-type: none"> 1. Procedures for agricultural services (i.e., cropland and livestock) 2. Operator has procedures coordination with farm manager, operator, land owner, etc. 3. Operator has procedures for coordination with crop advisor and/or farm operator 4. Operator has procedures for flying appropriate platforms and payloads, i.e. cameras, sensors, etc. 5. Operator has procedures for coordinating with other aerial agricultural services, i.e. crop dusters 6. Operator has procedures for processing data 7. Operator has procedures for post-processing data 	Aviation Regulations Other Govt Regulations Industry Standard Industry Best Practice		✓
III. Training Program		Reference	I	O
A	All remote pilots have received TOP training as remote pilots	Association Standard	✓	✓
B	<p>The operator's remote pilots have knowledge of the following specific industry-wide competencies, including, but not limited to:</p> <ol style="list-style-type: none"> 1. Field surveying/scouting (before planting) 2. Crop scouting (after planting) 3. Weed scouting 4. Insect scouting 5. Disease scouting 6. Plant population crop health monitoring 7. Nutrient management 8. Irrigation monitoring 9. Yield assessment 10. Plant stress monitoring 11. Aerial application 12. Drought assessment 13. Weather damage (crop insurance) 14. Animal damage to crops (crop insurance) 15. Livestock monitoring 16. Fence monitoring 17. Waterhole assessment 18. Mineral block assessment 19. Grazing management 20. Invasive species 21. Rustling detection 22. Pasture health 23. Radio-frequency identification (RFID) tag data capture 24. Face recognition 25. Waste management 	Aviation Regulations Other Govt Regulations Industry Standard	✓	
IV. Maintenance and Inspection Program		Reference	I	O
A	All protocols must be satisfied from TOP Level 3			✓
V. Safety Management System		Reference	I	O
A	All protocols must be satisfied from TOP Level 3			✓
VI. Practical UAS Flight Assessment		Reference	I	O
A	All remote pilots have received TOP assessments as remote pilots	Association Standard	✓	✓
B	All remote pilot instructors have received TOP assessments as remote pilot instructors	Association Standard	✓	
C	All remote pilots have participated in operational incident, exercise, drill, or simulation at least once every two years	Other Govt Regulations Industry Standard Industry Best Practice	✓	

UAS FOR ENVIRONMENTAL SERVICES

Functional Area Protocols for Level 3 TOP Environmental Services Remote Pilots		Required
I.	Management System	✓
II.	Operational Procedures	
III.	Training Program	✓
IV.	Maintenance and Inspection Program	
V.	Safety Management System	
VI.	Practical UAS Flight Assessment	✓

Functional Area Protocols for Level 3 TOP Environmental Services Service Providers		Required
I.	Management System*	✓
II.	Operational Procedures	✓
III.	Training Program	✓
IV.	Maintenance and Inspection Program	✓
V.	Safety Management System	✓
VI.	Practical UAS Flight Assessment	

*A TOP service provider must maintain two TOP certified key remote pilots or one TOP certified instructor to maintain their status as a TOP environmental service provider.

Functional Area Performance Measures for Environmental Operators The two check columns indicate either I = Individual or O = Organization				
	I. Management System	Reference	I	O
A	All protocols must be satisfied from TOP Level 3		✓	✓
	II. Operational Procedures	Reference	I	O
A	The operator utilizes well developed and documented Standard Operating Procedures (SOPs) and checklists for Specific Industry-Sector Operations, including but not limited to: 1. Operator has procedures for environmental services 2. Operator has procedures to reduce the stress and disturbance to wildlife during operations 3. Operator has procedures for environmentally responsible operations 4. Operator has procedures for post processing data (including planning objectives, quality assurance components, and sampling procedures) 5. Operator has quality assurance and quality control procedures for environmentally-focused projects 6. Operator has procedures for a quality assessment to determine the type, quantity, and quality of data collected for an environmental research project 7. Operator has procedures for agricultural services (i.e., cropland and livestock) 8. Operator has procedures for coordination with land owner 9. Operator has procedures for coordination with crop advisor 10. Operator has procedures for flying thermal payloads 11. Operator has procedures for post processing data	Aviation Regulations Other Govt Regulations Industry Standard Industry Best Practice		✓
	III. Training Program	Reference	I	O
A	All remote pilots have received TOP training as remote pilots	Association Standard	✓	✓
B	The operator's remote pilots have knowledge of the following specific industry competencies, including, but not limited to: 1. Environmental impacts 2. Tracking migration 3. Animal health 4. Animal rescue 5. Species counting 6. Weather impacts	Aviation Regulations Other Govt Regulations Industry Standard	✓	
	IV. Maintenance and Inspection Program	Reference	I	O
A	All protocols must be satisfied from TOP Level 3			✓

V. Safety Management System		Reference	I	O
A	Operator has procedures for reporting, removal or abatement of any hazardous material spills	Other Govt Regulations Industry Standard Industry Best Practice		✓
B	Operator has a program to protect habitat, plants, shrubs, and trees during operations	Other Govt Regulations Industry Standard Industry Best Practice		✓
C	Operator has a program to assess environmental risks	Other Govt Regulations Industry Standard Industry Best Practice		✓
D	Operator develops maps depicting risks to wildlife	Other Govt Regulations Industry Standard Industry Best Practice		✓
VI. Practical Flight Assessment		Reference	I	O
A	<p>All remote pilots have received TOP assessments as remote pilots on specific industry-sector competencies, including, but not limited to:</p> <ol style="list-style-type: none"> 1. Minimally invasive flight patterns 2. Knowing how to avoid flying directly over wildlife 3. Awareness of the noise signature of their aircraft, taking steps to limit ambient UAS noise, and considering system modifications that do so 4. Avoiding close proximity to wildlife: The remote pilot considers the potential impact of the UAS on animal life and comply with recommended practices when flying near wilderness, wildlife, marine sanctuaries, and other environmentally sensitive areas. The remote pilot recognizes that the UAS may attract, frighten or injure birds and other animals. The remote pilot remembers that the UAS may be mistaken as predators by nesting birds and other wildlife, causing harmful stress or abandonment of nests and habitat 5. Assess behavioral cues and adjust flight plan accordingly and safely 6. How to complete a post-flight assessment to ensure that the UAS operations did not cause environmental harm. If the UAS operation causes damage to a property or the environment, the remote pilot restores it to its previous condition. 	<p>Association Standard Other Govt Regulations Industry Standard Industry Best Practice</p>	✓	
B	<p>All remote pilot instructors have received top assessments as remote pilot instructors on specific industry-sector competencies, including, but not limited to:</p> <ol style="list-style-type: none"> 1. Minimally invasive flight patterns 2. Knowing how to avoid flying directly over wildlife 3. Awareness of the noise signature of their aircraft, taking steps to limit ambient UAS noise, and considering system modifications that do so 4. The instructors consider the potential impact of the UAS on animal life and comply with recommended practices when flying near wilderness, wildlife, marine sanctuaries, and other environmentally sensitive areas. The instructor recognizes that the UAS may attract, frighten or injure birds and other animals. The instructor remembers that the UAS may be mistaken as predators by nesting birds and other wildlife, causing harmful stress or abandonment of nests and habitat 5. Assess behavioral cues and adjust flight plan accordingly and safely. 6. How to complete a post-flight assessment to ensure that the UAS operations did not cause environmental harm. If the UAS operation causes damage to a property or the environment, the instructor restores it to its previous condition (minimally invasive flight patterns). 7. Do not fly directly over wildlife 8. Be aware of the noise signature of your aircraft, take steps to limit ambient UAS noise, and consider system modifications that do so 9. Avoid close proximity to wildlife: Consider the potential impact of UAS on animal life, and comply with recommended practices when flying near wilderness, wildlife, marine sanctuaries, and other environmentally sensitive areas. Recognize that UAS may attract, frighten, or injure birds and other animals. Remember that UAS may be mistaken as predators by nesting birds and other wildlife, causing harmful stress or abandonment of nests and habitat. 10. Complete a post-flight assessment to ensure that the UAS operations did not cause environmental harm. If the UAS operation causes damage to property or the environment, restore it to its previous condition 	<p>Other Govt Regulations Industry Standard Industry Best Practice</p>	✓	
C	All remote pilots have participated in operational incident, exercise, drill, or simulation at least once every two years	Other Govt Regulations Industry Standard Industry Best Practice	✓	

UAS FOR INFRASTRUCTURE AND UTILITY INSPECTIONS

Functional Area Protocols for Level 3 TOP Infrastructure and Utility Inspections Remote Pilots		Required
I.	Management System	✓
II.	Operational Procedures	
III.	Training Program	✓
IV.	Maintenance and Inspection Program	
V.	Safety Management System	
VI.	Practical UAS Flight Assessment	✓

Functional Area Protocols for Level 3 TOP Infrastructure and Utility Inspections Service Providers		Required
I.	Management System*	✓
II.	Operational Procedures	✓
III.	Training Program	✓
IV.	Maintenance and Inspection Program	✓
V.	Safety Management System	✓
VI.	Practical UAS Flight Assessment	

*TOP service providers must maintain two TOP certified key remote pilots or one TOP certified instructor to maintain their status as a TOP infrastructure and utility service provider.

Functional Area Performance Measures for Infrastructure and Utility Operators				
The two check columns indicate either I = Individual or O = Organization				
	I. Management System	Reference	I	O
A	Operator has required license, certificate or permit to operate commercially within their state or country	Aviation Regulations Other Govt Regulations Industry Standard	✓	✓
	II. Operational Procedures	Reference	I	O
A	The operator utilizes well developed and documented standard operating procedures (SOPs) and checklists for specific industry-sector operations, including but not limited to: 1. Operator has procedures for infrastructure and utility services 2. Operator has procedures for operations near power conductors 3. Operator has procedures for coordination with energy owner 4. Operator has procedures for coordination with energy advisor 5. Operator has procedures for flying thermal payloads 6. Operator has procedures for electromagnetic interference (EMI) and other effects of electromagnetic (EM) transmissions 7. Operator conducts training in IEEE and other industry standards 8. Operator has procedures for post processing data	Aviation Regulations Other Govt Regulations Industry Standard Industry Best Practice		✓
	III. Training Program	Reference	I	O
A	All remote pilots have received TOP training as remote pilots	Association Standard	✓	✓
B	The operator's remote pilots have knowledge of the following specific industry-specific competencies, including, but not limited to: 1. Emergency response training 2. Hazardous materials awareness training 3. Competency with remote sensing technologies (i.e. photogrammetry, live video, lidar, thermal imaging) 4. "Fly the Wire" or equivalent training awareness course	Aviation Regulations Other Govt Regulations Industry Standard		✓
	IV. Maintenance and Inspection Program	Reference	I	O
A	All protocols must be satisfied from TOP Level 3			✓

V. Safety Management System		Reference	I	O
A	The operator has a physical fitness program	Other Govt Regulations Industry Standard Industry Best Practice		✓
B	The operator has a critical incident stress management program	Other Govt Regulations Industry Standard Industry Best Practice		✓
C	The operator has a cyclic crew resource management (CRM) and human factors in the wire environment course	Other Govt Regulations Industry Standard Industry Best Practice		✓
VI. Practical UAS Flight Assessment		Reference	I	O
A	All remote pilots have received TOP assessments as remote pilots on specific industry-sector competencies, including, but not limited to: 1. Emergency response 2. Competency with remote sensing technologies (i.e. photogrammetry, live video, lidar, thermal imaging) 3. 'Fly the Wire' or equivalent training awareness course	Association Standard Other Govt Regulations Industry Standard Industry Best Practice	✓	
B	All remote pilot instructors have received TOP assessments as remote pilot instructors on specific industry-sector competencies, including, but not limited to: 1. Emergency response 2. Competency with remote sensing technologies (i.e. photogrammetry, live video, lidar, thermal imaging) 3. "Fly the Wire" or equivalent training awareness course	Association Standard	✓	
C	All remote pilots have participated in operational incident, exercise, drill, or simulation at least once every two years	Other Govt Regulations Industry Standard Industry Best Practice	✓	

UAS FOR PETROLEUM, OIL AND GAS INSPECTIONS

Functional Area Protocols for Level 3 TOP Petroleum, Oil and Gas Remote Pilots		Required
I.	Management System	✓
II.	Operational Procedures	
III.	Training Program	✓
IV.	Maintenance and Inspection Program	
V.	Safety Management System	
VI.	Practical UAS Flight Assessment	✓

Functional Area Protocols for Level 3 TOP Petroleum, Oil and Gas Service Providers		Required
I.	Management System*	✓
II.	Operational Procedures	✓
III.	Training Program	✓
IV.	Maintenance and Inspection Program	✓
V.	Safety Management System	✓
VI.	Practical UAS Flight Assessment	

*A TOP service provider must maintain two TOP certified key remote pilots or one TOP certified instructor to maintain their status as a TOP petroleum, oil and gas service provider.

Functional Area Performance Measures for Petroleum, Oil and Gas Operators				
The two check columns indicate either I = Individual or O = Organization				
	I. Management System	Reference	I	O
A	Operator has required license, certificate or permit to operate commercially within their state or country	Aviation Regulations Other Govt Regulations Industry Standard	✓	✓
B	Operator has a policy that requires transparency, community engagement, publicly-available annual reporting, inquiry and complaints processes, and periodic program evaluation	Aviation Regulations Other Govt Regulations Industry Standard		✓
C	Operator has disclaimer policy that products produced are supplemental information and must be accepted and stamped by state licensed surveyors prior to being used in design	Aviation Regulations Other Govt Regulations Industry Standard		✓
D	Operator understands that a TOP Level 3 certification is not a replacement for state licensing (i.e. state licensed surveyors) and retains applicable licensing as appropriate	Aviation Regulations Other Govt Regulations Industry Standard		✓
E	Operator has a policy in place for permitted and prohibited uses of UAS; operator also requires a documented methodical assessment of UAS technology and its impact on the community	Aviation Regulations Other Govt Regulations Industry Standard		✓
F	Operator has a policy in place that defines the permitted and prohibited uses of UAS	Aviation Regulations Other Govt Regulations Industry Standard		✓
G	Specific job site command, control and communications protocols exist for specific mission sites as appropriate	Aviation Regulations Other Govt Regulations Industry Standard		✓
H	Operator retains documented processes and procedures for appropriate operations; the customer retains an organizational chart for establishing the hierarchy and communication channels	Aviation Regulations Other Govt Regulations Industry Standard		✓

II. Operational Procedures		Reference	I	O
A	<p>The operator utilizes well developed and documented standard operating procedures (SOPs) and checklists for specific industry-sector operations, including but not limited to:</p> <ol style="list-style-type: none"> 1. Operator has procedures for operations near power conductors 2. Operator has procedures coordination with energy owner 3. Operator has procedures for coordination with energy advisor 4. Operator has procedures flying thermal payloads 5. Operator has procedures of EMI and other effects of EM transmissions 6. Operator conducts training in IEEE and other industry standards 7. Operator has procedures for post-processing data 	<p>Aviation Regulations Other Govt Regulations Industry Standard Industry Best Practice</p>		✓
III. Training Program		Reference	I	O
A	All remote pilots have received TOP training as remote pilots	Association Standard	✓	✓
B	<p>The operator's remote pilots have knowledge of the following specific industry-wide competencies, including, but not limited to:</p> <ol style="list-style-type: none"> 1. Emergency response training 2. Hazardous materials awareness training 3. Competency with remote sensing technologies (i.e. photogrammetry, live video, lidar, thermal imaging) 4. "Fly the Wire" or equivalent training awareness course 5. Helicopter underwater escape training (HUET) 6. Advanced first aid training 	<p>Aviation Regulations Other Govt Regulations Industry Standard</p>	✓	
IV. Maintenance and Inspection Program		Reference	I	O
A	All protocols must be satisfied from TOP Level 3			✓
V. Safety Management System		Reference	I	O
A	The operator has a physical fitness program	<p>Other Govt Regulations Industry Standard Industry Best Practice</p>		✓
B	The operator has a critical incident stress management program	<p>Other Govt Regulations Industry Standard Industry Best Practice</p>		✓
C	The operator has a cyclic crew resource management (CRM) and human factors in the wire environment course	<p>Other Govt Regulations Industry Standard Industry Best Practice</p>		✓
VI. Practical UAS Flight Assessment		Reference	I	O
A	<p>All remote pilots have received TOP assessments as remote pilots on specific industry-sector competencies, including, but not limited to:</p> <ol style="list-style-type: none"> 1. Emergency response 2. Competency with remote sensing technologies (i.e. photogrammetry, live video, lidar, thermal imaging) 3. "Fly the Wire" or equivalent training awareness course 	<p>Association Standard Other Govt Regulations Industry Standard Industry Best Practice</p>	✓	
B	<p>All remote pilot instructors have received TOP assessments as remote pilot instructors on specific industry-sector competencies, including, but not limited to:</p> <ol style="list-style-type: none"> 1. Emergency response 2. Competency with remote sensing technologies (i.e. photogrammetry, live video, lidar, thermal imaging) 3. "Fly the Wire" or equivalent training awareness course 	Association Standard	✓	
C	All remote pilots have participated in operational incident, exercise, drill, or simulation at least once every two years	<p>Other Govt Regulations Industry Standard Industry Best Practice</p>	✓	

UAS FOR PUBLIC SAFETY OPERATIONS

Functional Area Protocols for Level 3 TOP Public Safety Remote Pilots		Required
I.	Management System	✓
II.	Operational Procedures	
III.	Training Program	✓
IV.	Maintenance and Inspection Program	
V.	Safety Management System	
VI.	Practical UAS Flight Assessment	✓

Functional Area Protocols for Level 2 TOP Public Safety Service Providers (Government)		Required
I.	Management System*	✓
II.	Operational Procedures	✓
III.	Training Program	✓
IV.	Maintenance and Inspection Program	
V.	Safety Management System	
VI.	Practical UAS Flight Assessment	

*A TOP service provider must maintain two TOP certified key remote pilots or one TOP certified instructor to maintain their status as a TOP public safety service provider.

Functional Area Protocols for Level 3 TOP Public Safety Service Providers		Required
I.	Management System*	✓
II.	Operational Procedures	✓
III.	Training Program	✓
IV.	Maintenance and Inspection Program	✓
V.	Safety Management System	✓
VI.	Practical UAS Flight Assessment	

*A TOP service provider must maintain two TOP certified key remote pilots or one TOP certified instructor to maintain their status as a TOP public safety service provider.

Functional Area Performance Measures for Public Safety Operators				
The two check columns indicate either I = Individual or O = Organization				
	I. Management System	Reference	I	O
A	Operator has required license, certificate or permit to operate commercially within their state or country	Aviation Regulations Other Govt Regulations Industry Standard	✓	✓
B	Operator has a policy about constitutional provisions and applicable laws and regulations that safeguard individual rights to privacy, civil rights and civil liberties	Aviation Regulations Other Govt Regulations Industry Standard		✓
C	Operator has a policy in place that defines the permitted and prohibited uses of UAS in the usage policy so as to address community and privacy concerns	Aviation Regulations Other Govt Regulations Industry Standard		✓
D	Operator has a policy that requires a documented methodical assessment of UAS technology and its impact on the community	Aviation Regulations Other Govt Regulations Industry Standard		✓
E	Operator has a policy that requires the minimization of personally identifiable information (PII) UAS-collected data, evidence procedures, and disposition of UAS-collected data	Aviation Regulations Other Govt Regulations Industry Standard		✓
F	Operator has a policy that requires transparency, community engagement, publicly-available annual reporting, inquiry and complaints processes, and periodic program evaluation	Aviation Regulations Other Govt Regulations Industry Standard		✓
G	Operator demonstrates the process to obtain a Part 107 waiver, authorization, or special government interest COA request	Aviation Regulations Other Govt Regulations Industry Standard		✓

II. Operational Procedures		Reference	I	O
A	<p>The operator utilizes well developed and documented standard operating procedures (SOPs) and checklists for specific industry-sector operations, including but not limited to:</p> <ol style="list-style-type: none"> 1. Operator has procedures to obtain a part 107 waiver, authorization or special government interest (SGI) request 2. Operator has a procedure for coordination with the appropriate emergency air operations branch director 3. Operator applies aeronautical decision making for go/no-go decisions 4. Operator has a procedure for night operations 5. Operator has a missing person search procedure 6. Operator has a hasty search procedure 7. Operator has a grid search procedure 8. Operator has an evidence search procedure 9. Operator has a damage-assessment procedure 10. Operator has a post-fire assessment procedure 	<p>Aviation Regulations Other Govt Regulations Industry Standard Industry Best Practice</p>		✓
III. Training Program		Reference	I	O
A	All remote pilots have received TOP training as remote pilots	Association Standard	✓	✓
B	Public safety remote pilots are certified in the incident command systems (ICS) or national incident management systems (NIMS) 100, 200, 700, and 800 courses	Aviation Regulations Other Govt Regulations Industry Standard	✓	✓
C	<p>The operator's remote pilots have knowledge of the following specific industry-sector competencies, including:</p> <ol style="list-style-type: none"> 1. Mission objectives 2. System limitations 3. Waypoint parameters 4. Airspace and air traffic control (ATC) considerations 5. Payload selection process and determination of an appropriate sensor/payload 6. The effect of contingency operations 7. Airspace requirements for each anticipated flight 8. Requirements for thermal imagery data collection 9. Requirements for night operations 10. Requirements for ortho-rectified mapping 11. Public safety remote pilots are certified in Community Emergency Response Team (CERT) or American Radio Relay League (ARRL) Radio Training 	<p>Aviation Regulations Other Govt Regulations Industry Standard</p>	✓	
IV. Maintenance and Inspection Program		Reference	I	O
A	All protocols must be satisfied from TOP Level 3			✓
V. Safety Management System		Reference	I	O
A	All protocols must be satisfied from TOP Level 3			✓
VI. Practical UAS Flight Assessment		Reference	I	O
A	<p>All remote pilots have received TOP assessments as remote pilots on specific industry-sector competencies, including, but not limited to:</p> <ol style="list-style-type: none"> 1. Crime scene reconstruction 2. Accident scene reconstruction 3. Night operations 4. Thermal imagery data collection 5. Ortho-rectified mapping 6. Search 7. Damage assessment policy 8. Livestreaming 9. Wildfire monitoring 	<p>Association Standard Other Govt Regulations Industry Standard Industry Best Practice</p>	✓	
B	<p>All remote pilot instructors have received TOP assessments as remote pilot instructors on specific industry-sector competencies, including, but not limited to:</p> <ol style="list-style-type: none"> 1. Emergency response 2. Competency with remote sensing technologies (i.e. photogrammetry, live video, lidar, thermal imaging) 3. "Fly the Wire" or equivalent training awareness course 	Association Standard	✓	
C	All remote pilots have participated in operational incident, exercise, drill, or simulation at least once every two years	<p>Other Govt Regulations Industry Standard Industry Best Practice</p>	✓	

UAS FOR TRAINING PROVIDERS

Functional Area Protocols for Level 3 TOP Training Providers		Required
I.	Management System*	✓
II.	Operational Procedures	✓
III.	Training Program	✓
IV.	Maintenance and Inspection Program	✓
V.	Safety Management System	✓
VI.	Practical UAS Flight Assessment	✓

*A TOP service provider must maintain two TOP certified key remote pilots or one TOP certified instructor to maintain their status as a TOP public safety service provider.

Functional Area Performance Measures for Training Providers The two check columns indicate either I = Individual or O = Organization				
	I. Management System	Reference	I	O
A	Training Provider has required license, certificate or permit to operate commercially within their state or country	Aviation Regulations Other Govt Regulations Industry Standard		✓
B	Training Provider has at least two key accountable personnel individually certified to TOP Level 3	Aviation Regulations Other Govt Regulations Industry Standard		✓
C	Operator has at least two personnel certified as TOP Level 3 Remote Pilot Instructors	Aviation Regulations Other Govt Regulations Industry Standard		✓
	II. Operational Procedures	Reference	I	O
A	The Training Provider utilizes well-developed and documented procedures for training in UAS operations, including but not limited to: 1. Use and application of operations manual, safety manual, maintenance manual as applicable 2. Use of the aircraft manufacturer's handbook 3. Aircraft handling in flight, limitations, effects of environment 4. Aircraft handling in emergencies (ground-based and air based) 5. Effects of electromagnetic and frequency interference 6. Use of spectrum integrity checks (spectral analyzers or 'apps') 7. Use of geofencing 8. Use of privacy and security systems (encryption etc.) 9. Aircraft component care, pilot approved maintenance 10. Battery types and hazards 11. Battery tracking systems, (care, management, storage and transport)	Aviation Regulations Other Govt Regulations Industry Standard Industry Best Practice		✓
B	Documented training procedures for the following, including but not limited to: 1. Commercial operations 2. Training (instructing) and testing 3. Proficiency / recurrence requirements 4. Preflight procedures for all aircraft types (including checklists) 5. Procedures for flight planning for operational environments 6. A system where all normal procedures and contingencies are documented (including checklists) 7. Emergency response plan including quick reference checklists 8. Hand over / take over procedures are documented 9. Navigation tolerances and operations around airports are applied 10. Post flight procedures (checklists) 11. A method to stay proficient (practice schedule) 12. The operator has a proficiency / recurrent schedule appropriate for their operations	Aviation Regulations Other Govt Regulations Industry Standard Industry Best Practice		✓
	III. Training Program			
The Training Providers instructional activities and curriculum for Trusted Operator Program Level 1 Remote Pilots must include:		Reference	I	O
A	Air law applicable to the operational environment	Aviation Regulations Association Standards		✓

B	UAS operation and general knowledge, including but not limited to: 1. Use and retention of the aircraft/original equipment manufacturer's handbook 2. Aircraft orientation and lighting 3. Effects of electromagnetic and frequency interference 4. Aircraft component care 5. Battery care, management, storage and transport	Aviation Regulations Association Standards		✓
C	Flight performance, planning and loading	Aviation Regulations Other Govt Regulations Industry Standard		✓

The Training Providers instructional activities and curriculum for Trusted Operator Program Level 1 Remote Pilots must include:

		Reference	I	O
D	Air law applicable to the operational environment	Aviation Regulations and Regulatory Guidance Material AUVSI TOP PCM		✓
E	Meteorology and environmental elements, including, but not limited to: 1. Effects of wind in complex operational environments 2. Environmental limitations on aircraft and consequences of exceedance 3. Airframe icing conditions and effect on performance procedures to mitigate 4. Visual line of sight (VLOS) limitations (sun glare, visual illusions, slant distance, altitude etc.)	Aviation Regulations and Regulatory Guidance Material AUVSI TOP PCM		✓
F	UAS navigation elements, including, but not limited to: 1. Aviation chart knowledge and use 2. Use of NOTAM and TFR 3. Use of aviation frequencies (NAV) 4. Use of aviation radio (listening watch) 5. Accuracy limitations of GPS, WiFi, satellite (other systems used) 6. Use of smart applications 7. Operations in close proximity to heliports, and airports 8. Operations in close proximity to critical infrastructure / high value structures	AUVSI TOP PCM		✓
G	Human factors training should support the following, but not limited to: 1. Human centric threats and errors (FAA Dirty Dozen) and UAS specific human threats such as distraction, boredom and pilot interference 2. Tools to combat human centric threats (time pressure, commercial pressure, personal pressures and personal protective equipment) 3. Guidelines and tools to avoid fatigue and dehydration 4. Guidance on alcohol and drugs prior to or during operations 5. Drug and alcohol testing awareness program and policy	AUVSI TOP PCM		✓

The Training Providers instructional activities and curriculum for Trusted Operator Program Level 2 Remote Pilot Instructors must include:

		Reference	I	O
H	Teaching airmanship principles: 1. Know your aircraft, the capabilities and limitations in normal and non-normal scenarios 2. Know yourself, your limitations and personal habits that effect safety (rushing, impulsive, communication barriers, personal issues, financial issues) 3. Know your environment, the airspace, the weather, the operation 4. Know your team, conduct briefings, use your observers, communicate, be positive and 5. resolve conflicts quickly and fairly (focus on system not person) 6. Know the risks, always conducts a thorough risk assessment 7. Stay proficient, practice and conduct 'dry runs' of complex operations, and scenario- 8. based training for emergencies 9. Have the discipline to keep up to date on the latest safety and operational knowledge, including technical information regarding your platform 10. The importance of these principals to improve student situational awareness on every operation	AUVSI TOP PCM Industry Guidance Material		✓
I	UAS training basic instructing principles, including, but not limited to: 1. Teaching process principles 2. Construct UAS lesson plans 3. Conduct UAS assessments 4. Flight log management 5. Training record management	AUVSI TOP PCM		✓

III. Training Program (cont'd)				
The Training Providers instructional activities and curriculum for Trusted Operator Program Level 3 Remote Pilots must include:		Reference	I	O
J	General theoretical knowledge of the following areas: 1. Air law 2. UAS general knowledge 3. Flight performance, planning and loading 4. Meteorology 5. Navigation 6. Operational procedures 7. Principles of flight	AUVSI TOP PCM		✓
K	Expanded theoretical knowledge of the following areas: 1. Use of spectrum analyzers 2. Basic first aid 3. Operations around aerodromes and airports 4. Radiotelephony	AUVSI TOP PCM		✓
L	Expanded theoretical knowledge of human performance and UAS. The remote pilot will: 1. Recognize and manage threats and errors 2. Display crew resource management	AUVSI TOP PCM		✓
M	Training provider will have training material and exercises that demonstrates expanded theoretical knowledge of airmanship principles. The students remote pilot will: 1. Exercise good judgment and airmanship 2. Operate the UAS with limitations or those imposed by regulations 3. Apply aeronautical knowledge 4. Participate in professional development programs	AUVSI TOP PCM		✓
N	Expanded theoretical knowledge of skill, proficiency and roles in the following: 1. Preflight operations 2. Flight planning 3. Normal procedures 4. Abnormal and emergency procedures 5. Navigation 6. Post flight procedures	AUVSI TOP PCM		✓
O	Training and awareness material on Air Boss Qualification, including but not limited to: 1. When an Air Boss is needed 2. Standard check lists for the Air Boss 3. Communications with the Air Boss 4. Air Boss checklist 5. Emergency response plans 6. Considerations for minimum equipment 7. Third party responsibility and interaction 8. Air Boss log and record keeping	AUVSI TOP PCM		✓
The Training Providers instructional activities and curriculum for Trusted Operator Program Level 3 Remote Pilot Instructors must include:		Reference	I	O
P	Expanded theoretical knowledge of the principles of basic instructional teaching principles: 1. Directly demonstrate and monitor construct 2. How to conduct an assessment 3. Keeping flight training records 4. Training follow up and reporting	Aviation Regulations and Regulatory Guidance Material (if available) AUVSI TOP PCM		✓
Q	Expanded theoretical knowledge of skill, proficiency and testing elements: 1. Guidance on practice intervals 2. Types of elements to include in practice 3. Elements to include in assessments 4. What to record on proficiency checks	AUVSI TOP PCM		✓

IV. Practical UAS Flight Assessment			
The Training Providers practical flight assessment for Trusted Operator Program Level 2 Remote Pilot students must assess:		Reference	I 0
A	Ground elements including but not limited to:	Association Standards	✓
	<ol style="list-style-type: none"> 1. Attain all required permissions, permits and waivers, and ensure that they remain valid 2. Must operate within regulatory framework of mission/approvals etc. 3. Accurately complete all required checklists 4. Follow standard operating procedures in accordance with the flight being undertaken 5. Adhere to manufacturer's operating instructions 6. Accurately complete all aircraft and system checks 7. Ensure safety briefings are delivered to appropriate crew and or observers prior to flight 8. Monitor the airspace prior to and during entire flight 9. Use effective communication (professional aviation style language) prior and during operation 		
B	Normal, abnormal and emergency flight elements including, but not limited to:	Association Standards	✓
	<ol style="list-style-type: none"> 1. Recognize and manage emergency and abnormal conditions 2. Remotely pilot the UAS within its limitations imposed by regulation 3. Complete all maneuvers with smoothness and accuracy, as defined by industry standard 4. Exercise good judgment and airmanship 5. Apply aeronautical knowledge 6. Maintain control of the UAS at all times in a manner such that the successful outcome of a maneuver is assured 7. Recognize and manage emergency and abnormal conditions 		
The Training Providers practical flight assessment for Trusted Operator Program Level 2 Remote Pilot <u>Instructor</u> students must assess:		Reference	I 0
C	Remote pilot instructors delivering instruction on:	Aviation Regulations and Regulatory Guidance Material (if available)	✓
	<ol style="list-style-type: none"> 1. All ground elements 2. Specified elements from normal flight elements and emergency and non-normal elements 3. All ground elements and specified elements from normal flight elements and emergency and non-normal elements 	Association Standards	
The Training Providers practical flight assessment for Trusted Operator Program Level 3 Remote Pilot students must assess:		Reference	I 0
D	Ground elements, including but not limited to:	Association Standards	✓
	<ol style="list-style-type: none"> 1. Attain all required permissions, permits, waivers, and ensure they are valid 2. Operate within the regulatory framework of mission/approvals etc. 3. Accurately complete all required checklists 4. Company Standard Operating Procedures are followed 5. Demonstrate adherence to manufacturer's operating instructions 6. Aircraft and system checks, and tests are completed accurately 7. Safety brief is delivered to appropriate crew prior to flight 8. Airspace is monitored prior to and during entire flight 9. Effective communication is used (professional language) prior and during operation 		
E	Normal, abnormal and emergency flight elements including, but not limited to:	Association Standards	✓
	<ol style="list-style-type: none"> 1. Recognize and manage emergency and abnormal conditions 2. Remotely pilot the UAS within its limitations imposed by regulation 3. Complete all maneuvers with smoothness and accuracy, as defined by industry standard 4. Exercise good judgment and airmanship 5. Apply aeronautical knowledge 6. Maintain control of the UAS at all times in a manner such that the successful outcome of a maneuver is assured 7. Recognize and manage emergency and abnormal conditions 		
F	Performance as an Air Boss:	Association Standards	✓
	<ol style="list-style-type: none"> 1. Curricula and assessment elements listed in the back of the PCM 2. Practical or virtual demonstration of performance (requirement to have 2 remote pilots operating two aircraft simultaneously with simulated bystanders) 		
The Training Providers practical flight assessment for Trusted Operator Program Level 3 Remote Pilot students must assess:		Reference	I 0
G	Remote pilot instructors delivering instruction on:	Association Standards	✓
	<ol style="list-style-type: none"> 1. All ground elements 2. Specified elements from normal flight elements and emergency and non-normal elements 3. All ground elements and specified elements from normal flight elements and emergency and non-normal elements 		

END OF SECTION 3



SECTION 4

ADDITIONAL RESOURCES AND GUIDANCE

AIR BOSS SUPPLEMENT

DEFINITION AND ROLE OF THE TOP AIR BOSS

The TOP Air Boss is an individual who has been authorized by an AUVSI TOP operator (Training Provider, Service Provider or Certification Body only) to perform the Air Boss duties in connection with a UAS flight demonstration.

TOP operators may authorize a TOP Air Boss that has met the following requirements:

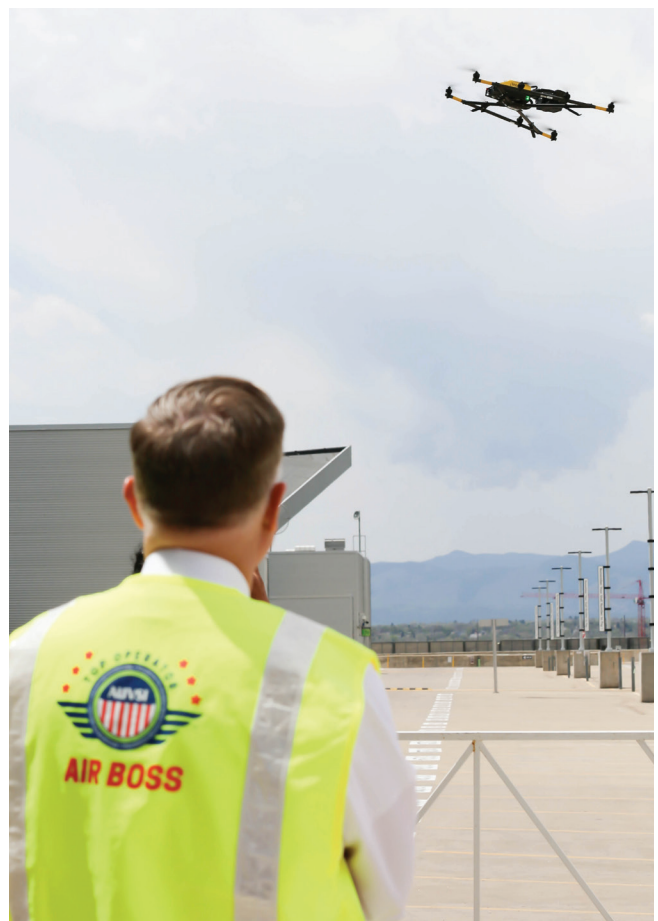
- A. Successfully achieved minimum of TOP Level 1 Certification
- B. Demonstrate knowledge in the use and application of the TOP Air Boss recommended safety guidance
- C. Demonstrate knowledge in the use and application of the TOP Air Boss checklist
- D. Demonstrate knowledge of the management of spectators
- E. Has demonstrated the ability to interpret information that will provide real time safety information to crew (i.e. weather apps, air band radio, etc.)

While each remote pilot in command is ultimately responsible for the safety of their flight, the TOP Air Boss provides the guidance and assistance, and the ultimate authority for the overall flight demonstration (this is especially important when there are multiple flight crews participating in one demonstration or multiple aircraft are in the air at once).

The TOP Air Boss's role is a critical one, as they are tasked with monitoring the flight demonstration environment in "real time," (as an example, the spectator's movements and behavior, security breaches, potential hazards around the flight zone and or the ground control areas, any approaching weather, lose or unsecured equipment etc). Therefore, to be effective, the TOP Air Boss should be involved as key participant in the preparation, organization and management of the fight demonstration or multiple aircraft operation.

The role of the TOP Air Boss is of great assistance to the remote pilot in command and their teams, as it allows them to concentrate on the safe flying and their team coordination, it also provides a valuable safety and security resource for all the pilots and crew as an additional safety supervisor for the event. The TOP Air Boss will conduct themselves to the same principles of professionalism outlined in airmanship and pilot code of conduct protocols in this PCM.

The TOP Air Boss duties are outlined in the recommended safety guidance, and the TOP Air Boss checklist in this section.



RECOMMENDED SAFETY GUIDANCE FOR FLIGHT DEMONSTRATIONS

It is recommended that the following conditions are followed when a TOP operator participates and or manages UAS live flight demonstrations:

1. Job safety assessment/risk assessment – TOP

operators must provide an appropriately detailed safety risk assessment (RA), for the flight demonstration task (sometimes also referred to as a job safety assessment or JSA). The provisions outlined in the RA or JSA must be briefed to the operating crew. The TOP Air Boss must be given a copy of the RA/JSA and be included in the briefings.

2. Operational change – The aircraft and equipment used for the flight demonstration, must be same as detailed in the RA or JSA. If there are changes, a new RA or JSA should be generated and the changes communicated to the Air Boss, crew and other stakeholders (such as the insurance company). The rationale is that flight profiles and aircraft performance, insurance and safety precautions are often predicated on the specific aircraft and systems.

3. Location specific regulations, permits – The TOP operators must adhere to any additional requirements for operating UAS flights in that area (examples of these may be connected to environmental, local or state government regulations, the property owner's policies, or safety or security guidance, etc). The TOP Air Boss should provide assistance in gathering this information and share it with the crews.

4. TOP operating crew details* – The TOP Air Boss must gather and retain the following details of all crew members participating in the flight demonstration. This is important for many reasons, one being the TOP Air Boss is the point of contact for all operational matters including emergencies.

A. Full name of crew member and role in the demonstration (i.e. Remote PIC, Observer, Remote Pilot, Support Crew etc.)

- B. Contact number during the operation. (multiple crew cannot share the one contact number)
- C. Remote Pilot Certificate/License Number (for pilots)
- D. Evidence of Insurance (if applicable)

5. Incidents or accidents that occur during the demonstration – Incidents or accidents must be

immediately reported to the TOP Air Boss, who will initiate the appropriate safety response, or the emergency response plan (ERP) as required.

A. The TOP Air Boss and the remote pilot in command will communicate to ensure that the event, if applicable, is reported in accordance with the requirements in FAR Part 107.9.

B. If the accident involves a manned aircraft, the report must be in accordance with Title 49, part 830 (NTSB Response Operations Center at (844) 373-9922. In many cases, the pilot will be directed to complete Form 6120.1, the Pilot/Operator Aircraft Accident Report, which can be found on the NTSB web site in PDF format. The completed form must be submitted to the NTSB via email, mail or fax.

6. Be aware of stricter drug and alcohol requirements

– Some locations (such as industrial and mining sites) have their own published policies for drugs and alcohol that must be followed by all visiting commercial crew. One common example is on mine sites, where the blood alcohol concentration (BAC) is to 0.0 rather than 0.04 as required by FAA, or 0.02 as required by CASA, and UK CAA. In addition to this, many mine site policy states, there is to be no alcohol consumption within ten hours prior to reporting for duty, compared to eight hours as defined in FAR 107.27. Violation of an organization's drug and an alcohol policy, may void any insurance or legal protections and coverage.

* See TOP Air Boss Checklist on page 53.

GUIDELINES FOR MANAGING SPECTATORS

The Air Boss should ensure that spectators must not come within twenty-five feet of the UAS during operation if the spectators are not segregated or contained within a structure. The remote pilot controller must provide a safety briefing to all observers and crew. Where practical and available, section off the “No-Go” areas with cones, tape, signage or other markings. A “No-Go” area is the operational flight area and may include but is not limited to:

1. The take-off path, where the UAS will commence the initial climb to 50 feet.
2. The landing area and final approach path from the ground to 50 feet.
3. The overshoot or missed approach path to 50 feet.
4. Any designated alternate (contingency) or emergency landing area.
5. Areas well clear of any ground control station or ground monitoring station.
6. Areas well clear of the remote pilot in command.

If the spectators are not segregated or contained within a structure, it is also recommended that you clearly communicate to spectators some basic considerations before the flight demonstration, for their protection and safety.

These should include:

1. Where the “No-Go” areas are located
2. Any equipment that must not be interfered such as:
 - A. Aircraft or controller sets that are out on display or waiting to be used by the crew
 - B. Any computers or components of the Ground Control Station
 - C. Any other equipment such as stands, leads, batteries, signage etc.
 - D. Radio link equipment, including loose radios and phones associated with the crew
 - E. Remote pilots and support crew, such as observers

It also helps your demonstration if a brief description of the flight profiles and paths, and the expected flight time of the

demonstration is shared with spectators. This will help maintain awareness of what is going on in the environment, and also increase their engagement.

The Air Boss should be aware and involved in all safety briefings, including those with any location safety managers. The TOP Air Boss must know how to use and the location of emergency equipment, the emergency procedures and contacts and the designated vehicle parking area (if applicable) for those emergency crews. If this is communicated by a briefing to the TOP Air Boss by the location safety manager, the TOP Air Boss must share this with the remote pilots in command and their crews.





EXAMPLE (Modify to your operational requirements) TOP AIR BOSS CHECKLIST

Name: _____ Date: _____

INSURANCE	YES	NO
Certificate of insurance – includes UAS Operations	<input type="checkbox"/>	<input type="checkbox"/>
TOP operator certification/appropriate insurance	<input type="checkbox"/>	<input type="checkbox"/>
UAS REMOTE PILOT OBSERVERS AND SAFETY PERSONNEL	YES	NO
Appropriately licensed – (by the FAA or waiver attained and sighted)	<input type="checkbox"/>	<input type="checkbox"/>
Qualified and experienced – (documented training, recognized training appropriate for task)	<input type="checkbox"/>	<input type="checkbox"/>
AUVSI TOP operator certification	<input type="checkbox"/>	<input type="checkbox"/>
Identify professional observers and safety assistants and appropriately record details	<input type="checkbox"/>	<input type="checkbox"/>
Are remote pilot and observer(s) fit for duty (feeling well, not fatigued, access to hydration, shade, etc.)	<input type="checkbox"/>	<input type="checkbox"/>
Identify property safety manager and include them in your safety review (have their cell phone numbers)	<input type="checkbox"/>	<input type="checkbox"/>
AIRCRAFT - UAS	YES	NO
Confirm UAS is registered (Part 107.48 or appropriate FAA) and record correct aircraft to plan is used	<input type="checkbox"/>	<input type="checkbox"/>
Confirm communications/C2 link integrity and allocation to avoid interference	<input type="checkbox"/>	<input type="checkbox"/>
Confirm pilots and observers will follow their checklists and protocol despite unusual surrounds	<input type="checkbox"/>	<input type="checkbox"/>
Verify UAS and C2 functionality and control system is “Good to Go” with crew prior to flights	<input type="checkbox"/>	<input type="checkbox"/>
Ensure crew has sufficient space to assemble and operate free from public interference	<input type="checkbox"/>	<input type="checkbox"/>
View remote pilot in command /operator safety risk assessment of the flight task	<input type="checkbox"/>	<input type="checkbox"/>
POWER SUPPLY AND FIRE CONTROL	YES	NO
UAS and Control Station Batteries charge and usage protocols (these are “dangerous goods”)	<input type="checkbox"/>	<input type="checkbox"/>
Power cords and charging stations must be secure from public and have fire management protocols	<input type="checkbox"/>	<input type="checkbox"/>
A metal container with water is the only way to contain a lithium battery fire	<input type="checkbox"/>	<input type="checkbox"/>
WEATHER AND LOCAL HAZARDS	YES	NO
Confirmation with the remote pilots that the local weather forecast is suitable for flights (winds of 20 knots and higher are not suitable for flight)	<input type="checkbox"/>	<input type="checkbox"/>
Make sure crew is aware of any local phenomenon (gusts around alleys/buildings/and sun glare)	<input type="checkbox"/>	<input type="checkbox"/>
Make sure crew is aware of any obstructions such as powerlines, telecommunications lines or structural features	<input type="checkbox"/>	<input type="checkbox"/>
FLIGHT PROFILES AND FLYING OPERATIONS	YES	NO
Airspace assessment completed – permission to fly confirmed	<input type="checkbox"/>	<input type="checkbox"/>
NOTAM's / DRONETAM required / issued	<input type="checkbox"/>	<input type="checkbox"/>
Use of flight planning, air space information application or other application	<input type="checkbox"/>	<input type="checkbox"/>
Use of LAANC or other digital notification system	<input type="checkbox"/>	<input type="checkbox"/>
Communication – air radio serviceable and local air traffic control aware (listening watch) of flight event	<input type="checkbox"/>	<input type="checkbox"/>
Radio frequency spectrum analysis and allocation confirmed by RPIC and Air Boss	<input type="checkbox"/>	<input type="checkbox"/>
Launch and recovery areas setup/suitable – clear of public and markers in place	<input type="checkbox"/>	<input type="checkbox"/>
Lost link procedure understood and briefed with Air Boss	<input type="checkbox"/>	<input type="checkbox"/>
Return to base/return to home position established and briefed (alternate landing areas agreed-upon)	<input type="checkbox"/>	<input type="checkbox"/>
Emergency equipment is serviceable and checked	<input type="checkbox"/>	<input type="checkbox"/>
Emergency plan available and ready to be actioned should the need arise	<input type="checkbox"/>	<input type="checkbox"/>

DEFINITIONS AND ROLES

AIR BOSS

A TOP Air Boss is an individual who has been nominated and authorized by an AUVSI TOP Operator (Training Provider, Service Provider or Certification Body only) to perform the Air Boss duties in connection with a UAS flight demonstration.

APPLICANT

An individual or organization who is applying for TOP certification.

AUDITOR

An individual who is qualified by an accredited standards organization (ISO, ANSI, ASQ) and authorized to conduct a formal examination of processes and documents according to a specified criterion. A Lead Auditor is also qualified to organize, lead and manage a formal audit process, including other auditors who may conduct the audit.

GENERAL MAINTENANCE MANUAL (GMM)

This manual is a general overview of how an organization performs and achieves maintenance, policy and procedures for general maintenance.

INDEPENDENT AGENT

An independent agent is a person or business who performs services for a principal (i.e. another person or business) under an express or implied agreement and not subject to the principal's control, or right to control, the manner and means of performing the services. An independent agent is accountable to the principal only for the results of the principal's work assigned to him/her. An independent agent may have one or more principals at a time. A remote pilot instructor who represents multiple training providers or service providers is an example of an independent agent.

INDIVIDUALS

Remote pilots, student remote pilots, remote pilot instructors, and professional drone racers.

NON-HOBBY PURPOSES

Include UAS operations by government agencies operating under an FAA certificate of waiver or authorization (or public COA) or equivalent in other countries. This category also includes voluntary service organizations.

OPERATOR

This is a general term for an individual or organization who exercises authority over initiating, conducting or terminating a UAS flight, and who has not yet achieved TOP certification.

OPERATOR'S MAINTENANCE MANUAL (OMM)

The dedicated operator's manual which details specific maintenance procedures in addition to the manufacturer's manual, if the OEM manual is not compliant to industry-standard. This OMM shall include, but is not limited to:

1. List of remote pilot approved maintenance
2. Minimum Equipment Lists (MEL)
3. Controlled Deviation Lists (CDL)
4. Omitted topics from OEM required by industry-standard
5. Special procedures for added technology, modifications and equipment

ORGANIZATION

In the context of the TOP, UAS organizations can be in the fields of for-profit or non-profit, community service, humanitarian, search and rescue, or public safety. One of the purposes of the TOP is to provide safety, reliability, professionalism and trust in UAS services. In the context of the TOP, organizations are referred to as service providers.

ORIGINAL EQUIPMENT MANUFACTURERS (OEM) MANUAL

This manual is certified and approved from the original equipment manufacturer.

REMOTE PILOT

This is an individual who is qualified or authorized to operate an unmanned aircraft system (UAS). A remote pilot is sometimes referred to as a “drone pilot. A remote pilot is not necessarily a TOP remote pilot.

SERVICE PROVIDERS

Are individuals or organizations who provide UAS services to end users or beneficiaries (customers). In the context of the TOP, UAS organizations can be in the fields of for-profit or non-profit, community service, humanitarian, search and rescue, or public safety. One of the purposes of the TOP is to provide safety, reliability, professionalism and trust in UAS services.

TOP CERTIFYING BODY

Organizations with qualified lead auditors, auditors and trained assessors who carry out organizational safety audits and assessments on individuals and organizations. A TOP Certifying Body is authorized by AUVSI to provide all levels of TOP certification, to all categories of TOP operators (both individuals and organizations) TOP certifying bodies conduct audits and assessments in accordance with the protocols established in the AUVSI TOP PCM. TOP certifying bodies must retain at least two qualified auditors (see glossary) trained and proficient in auditing according to the AUVSI TOP PCM. TOP Certifying Bodies are only certified in accordance with Level 3.

TOP OPERATOR

This is a general term for any individual or organization who has achieved any level of TOP certification.

TOP REMOTE PILOT

A TOP remote pilot is an individual who has been certified as a TOP remote pilot in accordance with the TOP PCM to the level to which they have been trained and or tested. A TOP remote pilot will be issued a unique ID on their certificate, which will be retained in the AUVSI TOP registry.

TOP REMOTE PILOT INSTRUCTOR

Is an individual who has been certified as a TOP remote pilot (Level 2 or 3) in accordance with the TOP PCM to instruct and assess student remote pilots. TOP remote pilot instructors may only train and assess students to the TOP certification level of which they themselves hold, i.e., a TOP Level 2 remote pilot instructor cannot train and assess student pilots to TOP Level 3.

TOP SERVICE PROVIDER

Are organizations who have been certified by a TOP Certifying Body in accordance with the TOP PCM to provide UAS services to end users (customers). A TOP service provider must have at least two key pilots certified as TOP remote pilots or one TOP remote pilot instructor to maintain its status as a TOP service provider.

TOP TRAINING PROVIDER

Is one that has been certified by a TOP Certifying Body to deliver training, assessments and tests on individual student remote pilots, in accordance with the requirements within the TOP PCM. Training providers must be TOP certified before they can issue remote pilot TOP certification to students. Training providers can only certify individuals, not organizations.

TRAINING DEPARTMENTS

Approved and qualified departments within a TOP service provider that provide in-house training to their individual remote pilots in accordance with the TOP PCM. These Training departments must have at least one certified TOP Operator remote pilot Instructor (see TOP Remote Pilot Instructor), to deliver the training. TOP certification can only be awarded to the students by a licensed TOP training provider or TOP Certifying Body once all the requirements have been satisfied.

ACRONYMS

AA	Area Approval	NFZ	No Fly Zone
AC	Advisory Circular	NM	Nautical Mile
AGL	Above Ground Level	NOTAM	Notice to Airmen
AROC	Aeronautical Radio Operators Certificate	RP	Remote Pilot
ANSP	Air Navigation Service Provider	PIC	Pilot-In-Command
ATC	Air Traffic Control	PPL	Private Pilot License
ATM	Air Traffic Management	PFA	Proficiency Flight Assessment
ASSP	Aviation Safety Sensitive Personnel	RCP	Required Communication Performance
BRLOS	Beyond Radio Line-Of-Sight	RePL	Remote Pilots License
BVLOS	Beyond Visual Line of Sight	ReOC	Remote Operators Certificate
CARs	Canadian Aviation Regulations	RLOS	Radio Line-of-Sight
C2	Command and Control	ROC UASS	Operator Certificate
CA	Collision Avoidance	UAS	Remotely Piloted Aircraft
CDL	Configuration Deviation List	UASS	Remotely Piloted Aircraft System
C of A	Certificate of Airworthiness	RPS	Remote Pilot Station
COA	Certificate of Authorization	RVSM	Reduced Vertical Separation Minimum
COM	Communication	RWC	Remain Well Clear
CPA	Closest Point of Approach	SARPs	Standards and Recommended Practices
CPDLC	Controller-Pilot Data Link Communications	SMS	Safety Management System
DAA	Detect and Avoid	SSP	State Safety Programmed
DGs	Dangerous Goods	SSR	Secondary Surveillance Radar
DAMP	Drug and Alcohol Management Plan	TAWS	Terrain Awareness Warning System
DRONETAM	Drone Notice to Airmen	TC	Type Certificate
EVLOS	Extended Visual Line of Sight	TCDS	Type Certificate Data Sheet
FAA	Federal Aviation Authority	TEM	Threat and Error Management
GCS	Ground Control Station	TLS	Target Level of Safety
ICAO	International Civil Aviation Organization	Tsloss	Time (sustained loss of link)
ICA	Instructions for Continuing Airworthiness	TSO	Technical Standard Order
IAW	In accordance with	UA	Unmanned Aircraft
IFR	Instrument Flight Rules	UAS	Unmanned Aircraft System(s)
IMC	Instrument Meteorological Conditions	UAV	Unmanned Aerial Vehicle
ITU/WRC	International Telecommunications Union/ World Radio Conference	UOC	UAV Operators Certificate
MAC	Mid-Air Collision	VFR	Visual Flight Rules
MCM	Maintenance Control Manual	VHF	Very High Frequency
MMEL	Master Minimum Equipment List	VLL	Very Low Level
MPL	Multi-Crew Pilot License	VLOS	Visual Line-of-Sight
MTOM	Maximum Take-Off Mass	VMC	Visual Meteorological Conditions
		SCZ	Safety Critical Zone

AUVSI wishes to thank your peers on the Remote Pilots Council and the TOP Steering Committee who gave generously of their time and expertise to design and implement the Trusted Operator Program™.

Companies and organizations that participated in developing the TRUSTED OPERATOR PROGRAM™:

- AeroVironment
- Aeryon Labs
- Agricultural Aerial Remote Sensing Standards Council
- ASTM/TriVector Services
- AUVSI Cascade Chapter
- AUVSI Nevada Chapter
- Aviators Code Initiative
- Carolina Drone Academy
- Consortiq LLC
- DARTdrones
- DNV GL Business Assurance USA Inc.
- Dronifi
- Earth Terminal Control
- Embry-Riddle Aeronautical University
- FAAFAA Safety Team, AFS-920y
- FlightSafety Services Corporation
- Galaxy UAV
- Insitu, Inc
- King Schools
- Measure UAS, INC.
- National Association of Tower Erectors
- National Council on Public Safety UAS
- Nexutech, LLC
- NGAT Consortium at NC State University
- North Carolina Department of Transportation, Division of Aviation
- Oceans Unmanned, Inc.
- Planet Inhouse, Inc.
- Praxis Aerospace Concepts Int'l Inc
- RBD Solutions
- Remote Control Video Productions
- Roswell Flight Test Crew/AUVSI Cascade Chapter SAE International
- SGS Aviation Compliance
- TAMU-CC: Lone Star UAS Center of Excellence
- Texas A&M Center for Robot Assisted Search and Rescue
- Three Canyon Farms
- Topsight Imaging LLC
- Unmanned Experts Inc.
- Unmanned Safety Institute
- Virginia UAS
- Wolf UAS LLC
- Wyvern Ltd.
- York County Fire and Life Safety
- XM2

Thank you!



Supporting the Future
of Unmanned Aviation

AUVSI UAS CODE OF CONDUCT AND SAFETY CULTURE PLEDGE

All certified TOP Operators pledge to abide by the AUVSI UAS Code of Conduct and Safety Culture Pledge and commit to the following:

I pledge to...

- Follow airmanship principles, contained in the TOP PCM.
- Maintain the appropriate licensing, training, proficiency and competency on the UAS system being used.
- Conduct UAS flights only after a thorough assessment of risks associated with the activity. Risk assessment elements are detailed in the TOP PCM, at a minimum, they will include:
 - Check that weather and wind conditions support safe operations relative to the performance capability of the system.
 - Know my system's limitations and prepare for contingencies (lost link, power plant failures, loss of control, etc.). I will have an emergency plan ready.
 - Brief myself, my crew and spectators on the flight details and safety issues and protect my control area.
 - Confirm that my crew and I are fit for flight operations and free from the effects of drugs, alcohol, illness or fatigue.
 - Comply aviation regulations as appropriate to the operation and airspace. I will monitor the airspace during all flight operations for potential conflicts.
 - Establish a relationship and communicate with local law enforcement and public safety officials as appropriate. Know how to reach them in an emergency.
 - Confirm that I am familiar with equipment reliability, performance, and airworthiness standards, that all my paperwork is in order and at hand, including insurance and aircraft manuals.
 - Ensure all my equipment is working and compliant: Communication, command, control and payload frequency spectrum requirements. I will develop contingency plans.
 - Comply with all federal, state, and local laws, ordinances, covenants, and restrictions, including privacy, nuisance and trespassing.
 - Be respectful and responsive to the needs of the public and environment.
 - Cooperate fully with federal, state, and local authorities in response to emergency deployments and mishap investigations.
 - Promote integration into the national airspace by following regulations and utilizing LAANC and other approved tools.
- Share my experience to improve safety performance for others in the industry.
- Encourage other remote pilots to follow the AUVSI UAS Code of Conduct and Safety Culture Pledge.

..... **END OF SECTION 4**



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