WYVERN

UAS WINGMAN

for

Unmanned Aircraft Systems (UAS)

Standards Manual

Revision 3.0

May 17, 2024

Record of Revisions

Version Number	Date	Notes
1.0	02/22/2016	Initial issue
2.0	07/11/2022	Re-issue. Complete revision of all elements and formatting.
3.0	05/17/2024	Renamed UAS Wingman Standard Changed all references from RPAS to UAS.

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Preamble

WYVERN's mission is to protect lives by inspiring excellence is aerospace safety. Our vision is every aviation organization has a healthy safety culture; and we aspire to achieve this vision with our values of integrity, excellence, innovation, and relationships. This edition of the UAS Wingman Standard continues with the commitment to hold WYVERN certified operators to the high standards all stakeholders expect.

Conformance to the UAS Wingman Standard demonstrates a commitment to professionalism throughout the organization. We focus attention on hazards and associated safety risks related to organizational and human factors, the most prolific contributors to serious incidents and accidents as identified by aviation investigating authorities around the world. Organizational factors include implementing and maintaining:

- an operational management system (OMS) to manage fatigue and proficiency,
- safety management system (SMS) for flight operations and aircraft maintenance,
- occupational health and safety (OHS) management to protect your people, and
- an emergency response plan (ERP) to facilitate the effective transition from normal to emergency operations, and then back to normal operations.

The use of the word "shall" in this manual indicates a company requirement and is therefore considered policy. The use of the word "should" in this manual indicates company guidance, and while it establishes expectations for professional behavior, it is not considered policy. Any deviation from the policies established in this manual shall be processed and approved via WYVERN's Policy Waiver Process via QSMS.

DocuSigned by:
Sonnie Bates
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Sonnie Bates
Chief Executive Officer
WYVERN

Date: May 17, 2024

1.0 General

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1.3 Terms

May

The word “may” is used in a permissive sense to state authority or permission. Conformity is not mandatory.

Should

The word “should” is used in a permissive sense to state authority or permission. Conformity is recommended but is not mandatory.

Will, Shall, and Must

The words “will,” “shall,” and “must” are used in an imperative sense to state the necessity to accomplish the requirement prescribed. Conformity is mandatory.

1.4 Abbreviations and Acronyms

ACAS	Airborne collision avoidance system
ADS-B	Automatic dependent surveillance – broadcast
ADS-C	Automatic dependent surveillance – contract
AGL	Above ground level
AM(R)S	Aeronautical mobile route service
AMS(R)S	Aeronautical mobile satellite route service
ANSP	Air navigation services provider
ASBU	Aviation system block upgrade
ATC	Air traffic control
ATFM	Air traffic flow management
ATM	Air traffic management
ATS	Air traffic service
BRLOS	Beyond radio line-of-sight
BVLOS	Beyond visual line-of-sight
C2	C2 Link
CAA	Civil aviation authority
CNPC	Control and non-payload communications
CONOPS	Concept of operations

FF-ICE	Flight and flow information for a collaborative enviornment
FL	Flight level
FSS	Fixed satellite service
IFR	Instrument flight rules
MLAT	Multilateration
PANS	Procedures for air navigation services
PIC	Pilot-in-command
RCP	Required communication performance
RLOS	Radio line-of-sight
RNP	Required navigation performance
ROC	RPAS operator certificate
RPA	Remotely piloted aircraft
RPAS	Remotely piloted aircraft system
RPS	Remote pilot station
RWC	Remain-well-clear
SARPs	Standards and Recommended Practices
SSR	Secondary surveillance radar
UAS	Unmanned aircraft system
VFR	Visual flight rules
VHF	Very high frequency
VLOS	Visual line-of-sight

1.5 References

- Flight Safety Foundation Basic Aviation Risk Standard (UASS)
- FAA Integration of UAS in the National Airspace SystemRoadmap
- ICAO Cir 328, Unmanned Aircraft Systems (UAS)
- ICAO Doc 10019, Manual on Remotely Piloted Aircraft Systems (UASS)
- ICAO Doc 9859, Safety Management
- ICAO Annex 19, Safety Management Systems
- ISO 9000, Quality Management Systems
- ISO 14000, Environmental Management
- ISO 45000, Occupational Health and Safety
- UK CAP 722 Unmanned Aircraft System Operations in UK Airspace

1.6 Applicability

The standards published in this manual are applicable for the safety, effective, and efficient conduct of a remotely piloted aircraft systems (UASS).

1.7 Voluntary Implementation

The standards published in this manual are not regulations nor legally binding law. The UAS Wingman Standards are be applied by the Operator voluntarily.

1.8 Revision Responsibility

Revisions to this manual are the responsibility of WYVERN. A published revision to this manual will be outlined in the Record of Revisions section of this manual.

1.9 Assessment

The assessment team will measure the degree to which the operator conforms to the UAS Wingman Standards via documented and implemented policies, processes, and procedures, as applicable.

If the operator outsources operational functions, the services provided by the contractor shall be part of the operator's Quality Management System. It is the operator's responsibility to provide verifiable evidence that all outsourced functions are monitored by the operator to ensure fulfillment of applicable regulatory requirements affecting the safety and security of operations according to the operator's standard operating procedures and contractual requirements.

2.0 Management Systems

2.1 Operations Management System

OMS 1: The operator shall implement an operations management system (OMS) to ensure safe, secure, effective, and efficient operations.

OMS 2: The operator shall define operational excellence objectives and monitor related metrics to ensure achievement of these objectives.

OMS 3: The operator shall develop and maintain a manual or suite of manuals that include(s) as a minimum:

- the scope of the operator's functions,
- a matrix to verify compliance with applicable regulations,
- the policies, processes, and procedures that govern operations, and
- human performance principles.

OMS 4: The operator shall develop and maintain an Operations Manual. It shall contain as a minimum the following elements:

- General,
- Operating information for each aircraft operated to include normal, abnormal, and emergency procedures and associated checklists,
- Operational rules and guidance, and
- Required training.

OMS 5: The operator shall ensure that every mission is conducted in accordance with the provisions of the Operations Manual.

OMS 6: The operator shall have a document control system that includes procedures for the identification, archival, protection, recovery and retention of company documentation and company records.

OMS 7: The document control procedures shall ensure:

- Formal approval prior to issue and usage,
- Periodic review and update as necessary, and
- Use of only current information.

OMS 8: The document control system shall enable efficient identification of current and archived company manuals, documents, and records.

OMS 9: The operator shall:

- Provide appropriate resources (staffing, training, equipment, facilities, technology, etc.),
- Provide evidence of experience and qualifications of each team member to validate their suitability for their job position,
- Continually improve effectiveness of implemented management systems by conducting frequent and periodic management reviews.

OMS 10: The operator shall define and communicate accountabilities, authorities, and responsibilities of each person in the organization.

OMS 11: The operator shall ensure that all company personnel have a thorough understanding of their duties, responsibilities, and authorities within the company.

OMS 12: The operator shall ensure that all personnel involved in operations are properly trained and competent to perform their duties effectively.

OMS 13: The operator's accountable executive should ensure that all management personnel provide periodic performance reports to validate:

- the performance of their department,
- the effectiveness of processes and procedures implemented, and
- continual improvement.

OMS 14: The accountable executive should monitor quality in the following domains:

- Flight operations
- Aircraft maintenance and continued airworthiness
- Aircraft dispatch and Operational control
- Operational safety risk management
- Occupational health and safety
- Security
- Regulatory compliance
- Quality and Standardization
- Environmental protection

OMS 15: The operator's training program shall ensure that each employee is competent to effectively utilize the management system applicable to their duties.

OMS 16: The operator's training program shall include sufficient recurrent training courses related to each applicable management system.

OMS 17: The operator shall have an examination process to validate the employee's knowledge. The process shall address all training activities and shall include procedures for conduct, grading of the exam, and re-examination in the case of a failure.

OMS 18: The operator shall establish and maintain a process of exercising operational control over every flight.

2.2 Safety Management System (SMS)

SMS 1: The Operator shall implement and maintain a Safety Management System (SMS). The SMS shall include:

- Safety policy and objectives,
- Safety risk management process,
- Safety assurance, and
- Safety promotion

Note: It is recommended that the operator strives to achieve excellence in managing the safety risks highlighted in the Flight Safety Foundation's Basic Aviation Risk Standard for UASS operations.

SMS 2: The operator shall define its safety policy in accordance with international and national requirements. The safety policy shall:

a) reflect organizational commitment regarding safety, including the promotion of a positive safety culture;
b) include a clear statement about the provision of the necessary resources for the implementation of the safety policy;
c) include safety reporting procedures;
d) clearly indicate which types of behaviors are unacceptable related to the service provider's aviation activities and include the circumstances under which disciplinary action would not apply;
e) be signed by the accountable executive of the organization;

f) be communicated, with visible endorsement, throughout the organization; and

g) be periodically reviewed to ensure it remains relevant and appropriate to the service provider.

SMS 3: The operator shall define safety objectives. The safety objectives shall:

a) form the basis for safety performance monitoring and measurement as required by 3.1.2;

b) reflect the service provider's commitment to maintain or continuously improve the overall effectiveness of the SMS;

c) be communicated throughout the organization; and

d) be periodically reviewed to ensure they remain relevant and appropriate to the service provider.

Note.— Guidance on setting safety objectives is provided in the Safety Management Manual (SMM) (Doc 9859).

SMS 4: The operator shall:

a) identify the accountable executive who, irrespective of other functions, is accountable on behalf of the organization for the implementation and maintenance of an effective SMS;

b) clearly define lines of safety accountability throughout the organization, including a direct accountability for safety on the part of senior management;

c) identify the responsibilities of all members of management, irrespective of other functions, as well as of employees, with respect to the safety performance of the organization;

d) document and communicate safety accountability, responsibilities and authorities throughout the organization; and

e) define the levels of management with authority to make decisions regarding safety risk tolerability.

SMS 5: The operator shall appoint a safety manager who is responsible for the implementation and maintenance of the SMS.

Note.— Depending on the size of the operator and the complexity of its aviation products or services, the responsibilities for the implementation and maintenance of the SMS may be assigned to one or more persons, fulfilling the role of safety manager, as their sole function or combined with other duties, provided these do not result in any conflicts of interest.

SMS 6: The operator shall establish and maintain an emergency response plan (ERP) for

accidents and incidents in aircraft operations and other aviation emergencies and shall ensure that the ERP is properly coordinated with the ERPs of those organizations it must interface with during the provision of its products and services.

SMS 7: The operator shall develop and maintain an SMS manual that describes its:

a) safety policy and objectives;
b) SMS requirements;
c) SMS processes and procedures; and
d) accountability, responsibilities and authorities for SMS processes and procedures.

SMS 8: The operator shall develop and maintain SMS operational records as part of its SMS documentation.

Note.— Depending on the size of the operator and the complexity of its aviation products or services, the SMS manual and SMS operational records may be in the form of stand-alone documents or may be integrated with other organizational documents (or documentation) maintained by the service provider.

SMS 9: The operator shall develop and maintain a process to identify hazards associated with its aviation products or services.

SMS 10: Hazard identification shall be based on a combination of reactive and proactive methods.

SMS 11: The operator shall develop and maintain a process that ensures analysis, assessment and control of the safety risks associated with identified hazards.

Note.— The process may include predictive methods of safety data analysis.

SMS 12: The operator shall develop and maintain the means to verify the safety performance of the organization and to validate the effectiveness of safety risk controls.

Note.— An internal audit process is one means to monitor compliance with safety regulations, the foundation upon which SMS is built, and assess the effectiveness of these safety risk controls and the SMS. Guidance on the scope of the internal audit process is contained in the Safety Management Manual (SMM) (Doc 9859).

SMS 13: The operator's safety performance shall be verified in reference to the safety

performance indicators and safety performance targets of the SMS in support of the organization's safety objectives.

SMS 14: The operator shall develop and maintain a process to identify changes which may affect the level of safety risk associated with its aviation products or services and to identify and manage the safety risks that may arise from those changes.

SMS 15: The operator shall monitor and assess its SMS processes to maintain or continuously improve the overall effectiveness of the SMS.

SMS 16: The operator shall develop and maintain a safety training program that ensures that personnel are trained and competent to perform their SMS duties.

SMS 17: The scope of the safety training program shall be appropriate to each individual's involvement in the SMS.

SMS 18: The operator shall develop and maintain a formal means for safety communication that:

a) ensures personnel are aware of the SMS to a degree commensurate with their positions;
b) conveys safety-critical information;
c) explains why particular actions are taken to improve safety; and
d) explains why safety procedures are introduced or changed.

2.3 Emergency Response Planning (ERP)

ERP 1: The operator shall have an Emergency Response Plan (ERP) to manage and organize all activities to deal with foreseeable emergencies related to their operation.

ERP 2: The operator shall ensure the ERP is suitable for the size, nature, and complexity of its operation.

ERP 3: The operator shall ensure the continuation of safe operations when the ERP is active.

ERP 4: The ERP shall enable the effective transition from normal to emergency, and back to normal operations.

ERP 5: The Operator shall ensure that the ERP is available to all personnel

involved in operations.

ERP 6: The Operator shall coordinate their ERP with other organizations that they are likely to interface with during an emergency.

ERP 7: The operator shall ensure ERP training is conducted at least annually to verify the ERP's continuing relevance and effectiveness.

2.4 Occupational Health & Safety (OHS)

OHS 1: The operator should implement an Occupational Health & Safety (OHS) program to ensure their workplace hazards and associated risks are effectively managed.

OHS 2: The operator should nominate a person responsible to manage the OHS program.

OHS 3: The operator should engage all personnel to help detect OHS related issues.

OHS 4: The operator should institute an OHS committee involving senior management and staff members from each functional area.

OHS 5: The OHS committee should define measurable goals and objectives to be met with the OHS program.

OHS 6: The operator should have a process to conduct regular OHS inspections to identify unsafe conditions.

OHS 7: The operator should utilize a corrective action process similar to the SMS.

OHS 8: The operator should have a process for suggesting improvements to OHS.

OHS 9: The operator should maintain a hazard/risk register for the OHS program.

2.5 Security Threat Management (STM)

STM 1: The operator should have a Security Program to identify and manage potential and actual security threats to the organization.

STM 2: The Operator should have a security policy that states its commitment to maintain, enhance and promote security in all its endeavors. Such policy should be communicated throughout the organization and should:

- be validated by the most senior manager,
- be regularly revised and updated,
- include a commitment to provide adequate resources, and
- empower all personnel to enforce security.

STM 3: The operator should have a security threat and risk management program that includes:

- a process for determining security threats,
- a threat assessment and risk index system, and
- an evaluation process to validate the effectiveness of the risk controls.

STM 4: The operator should have a recruitment process that provides for an appropriate level of security background checking of new employees and contractors.

STM 5: The operator should ensure suitable security characteristics for facilities, equipment, and services.

STM 6: The operator should ensure that outsourced services have reasonable measures in place to mitigate security risks.

STM 7: The operator's change management process should ensure security risks are effectively managed before, during, and after the change.

STM 8: The operator should ensure continuous improvement in security risk management.

STM 9: The operator should establish measures to prevent unauthorized access, malicious interference, and attacks on personnel, hardware, and software.

STM 10: The operator should ensure security of command and control (C2) links to prevent hacking, spoofing, and other forms of interference or malicious attacks.

STM 11: The operator should restrict operations in areas of high radio frequency contamination.

STM 12: The operator should securely store all data and records related to the conduct of the operations.

2.6 Quality Management System (QMS)

QMS 1: The operator should implement a quality management system (QMS) and ensure the scope encompasses all other management systems.

QMS 2: The QMS documentation should include as a minimum:

- a description of the QMS
- duties and responsibilities of personnel involved in QMS
- a quality policy,
- quality objectives,
- processes to ensure:
    - regulatory compliance
    - conformity with UAS Wingman Requirements and Standards
    - monitoring of the UAS operation
    - quality control
    - quality assurance
    - reporting
    - corrective actions
    - document control
    - training

QMS 3: The operator should:

- ensure the QMS is utilized throughout the organization,
- deliver sufficient QMS training to all personnel involved in operations,
- provide adequate resources to ensure QMS implementation and maintenance,
- monitor, measure, and analyze QMS processes to ensure desired performance is achieved, and
- implement actions necessary to reach planned quality objectives.

QMS 4: The operator should ensure proper supervision over outsourced services and functions.

QMS 5: The operator should conduct periodic management evaluations, with the objective to review the company QMS for its suitability and effectiveness. The management evaluation should:

- be performed at least once per year or when deemed necessary,
- review the suitability and adequacy of policies and objectives,
- consider conclusions of previous management evaluations,
- review the results of QMS audits,
- review regulatory compliance status,
- review the status of preventive and corrective actions,
- evaluate strategic management changes that could affect operations, and
- assess opportunities for improvement.

QMS 6: The operator should ensure that contracts with vendors and customers include terms and conditions that effectively manage risks for the operator while holding the other party in the contract accountable for meeting their defined obligations.

QMS 7: The operator should have a process to review the requirements related to contract deliverables. This process should be conducted prior to committing to supply services and confirm the ability to meet the defined requirements.

QMS 8: The operator should ensure that purchased products and services conform to the operator's specified requirements.

QMS 9: The operator should evaluate and select suppliers based on their ability to supply products and services in accordance with the operator's requirements.

QMS 10: The operator should inspect and assess purchased products and services to ensure that they meet specified requirements prior to release for operational use. The operator should document the inspection results.

QMS 11: The operator should have an audit program that encompasses all operational company departments, including contracted service and product providers.

QMS 12: The audit program should define audit criteria, scope, frequency, objectives, and methods used. The audit program should ensure effective management of auditor selection, qualification, and training.

QMS 13: The audit program should define the responsibilities and requirements for planning and conducting audits, creating audit records and reporting audit results.

QMS 14: The audit program should have procedures to ensure:

- audits are conducted in an objective and unprejudiced manner,
- auditors are not assessing their own work, and
- all audit activities and audit results are documented and archived for a minimum of five (5) years.

QMS 15: The operator's QMS should have a corrective action process to eliminate the root-causes of nonconformities in order to prevent their recurrence. The process should include procedures for:

- analyzing nonconformities,
- determining root causes,
- implementing corrective actions that address root-causes,
- document corrective actions, and
- reviewing the effectiveness of the corrective action taken.

2.7 Environmental Protection Program (EPP)

EPP 1: The operator should implement an Environmental Protection Program (EPP).

EPP 2: The operator should establish objectives to protect the environment while conducting operator activities.

EPP 3: The operator should conduct a review to ensure their operations meet regulatory requirements related to environmental protection.

EPP 4: The EPP should have a risk management process that ensures assessment and control of environmental risks related to operations.

EPP 5: The operator should ensure environmental risks are managed to an acceptable level.

EPP 6: The operator should maintain a hazard/risk register for the EPP.

3.0 Technical Performance Factors (TPF)

3.1 Unmanned Aircraft Systems (UAS)

UAS 1: The operator shall ensure that the aircraft maintenance program complies with the requirements of the manufacturer and the State of Registry.

UAS 2: The operator shall have a process to ensure that the UAS is in an airworthy condition prior to conducting operations.

UAS 3: The operator shall have a process to ensure the UAS is maintained in accordance with the company maintenance program.

UAS 4: The operator shall have a process to ensure that the airworthiness of the UAS is maintained in accordance with airworthiness directives issued by the manufacturer of both the UAS and RPS.

UAS 5: The operator shall have a process to ensure that all modifications and repairs to the UASS are conducted strictly in accordance with the approved instructions of the manufacturer.

UAS 6: The operator shall have a training program to ensure that maintenance personnel are properly trained and qualified to maintain the whole UAS components to include airframe, systems, RPS, power plants as well as command and control links.

UAS 7: The operator shall have a process for the management and control of maintenance records of UAS, RPS, components, and C2 link.

UAS 8: The operator shall have a battery shelf-life process for batteries utilized in the operation of UAS.

3.2 Remote Pilot Station (RPS)

RPS 1: The operator shall clearly define responsibility for RPS operational control.

RPS 2: The operator shall have a process to review UAS procedures regarding their suitability and adequacy of the flight operation and missions to be conducted. The review process shall account as a minimum for:

- RPS shape, size, and layout,

- type of operation, VLOS or BVLOS,
- UAS complexity,
- type of control interface utilized,
- number of remote pilots required to operate the UAS, and
- RPS location – fixed or moving location.

RPS 3: The operator shall have procedures to manage, monitor, and control the UAS operation.

RPS 4: The operator shall have a process to ensure that the delegation of authority for UAS flight is conferred only to suitably qualified and licensed individuals to perform these functions.

RPS 5: The Operator shall have a process to ensure that an operational flight plan is completed for every intended flight. The operational flight plan shall:

- be approved and signed by the mission commander,
- plot the fuel/other source of energy,
- show position and progress of the flight,
- document the number of remote pilots, and
- state UAS crew duty time.

RPS 6: The Operator shall have a flight and mission planning procedure accounting for:

- flights over populated areas, considering the following:
  - minimum safe altitude,
  - emergency landing sites, and
  - heavily populated and housing areas.
- flights in dangerous areas and conditions, like:
  - in the proximity of volcanic, chemical or nuclear clouds,
  - gases, and
  - nuclear radiation.

RPS 7: The operator shall have procedures to ensure that UAS flights are executed in compliance with the respective airspace requirements of the State the UAS is operated, in regards of:

- approvals and authorizations of the States the UAS is operated,

- communications,
- navigation,
- surveillance, and
- separation from other traffic, and distances from clouds.

RPS 8: The operator shall have a procedure to prevent UAS operation in known icing conditions, unless the UAS and remote pilot are equipped, trained, and certified for cold weather operations.

RPS 9: The operator shall have a procedure to determine the meteorological conditions in which the UAS is operating during take-off and landing, regardless of VLOS or BVLOS in order to ensure the UAS is operating in accordance with applicable flight rules.

RPS 10: The operator shall have a procedure to determine an UAS type designator for each flight and document the UAS type designator in the ATC and operational flight plan.

RPS 11: The Operator shall have procedures for UAS performance calculations for every flight to be conducted. The performance calculations shall consider:

- speed,
- climb, descent or turn rates,
- wake turbulence,
- endurance,
- latency, and
- effect of bank angle on C2, and
- ATC communication link capability and reliability.

RPS 12: The operator shall have a procedure to determine the meteorological conditions while the UAS is enroute to ensure proper action is taken in the event the UAS is on a VFR flight and encounters IMC weather conditions.

RPS 13: The operator shall have procedures to ensure the right-of-way requirements of the State of Operation or ICAO Annex 2, as applicable, are fully adhered to and the UAS stays well clear of any manned or unmanned traffic.

RPS 14: The operator shall have a flight duty planning process to determine maximum flight duty times and minimum rest periods. It shall include procedures for fatigue risk management, monitor flight duty time, and time free from duty, for each UASS crew

member.

RPS 15: The operator shall have procedures for VLOS operation, including VLOS operations at night, where authorized by the State the UAS is operated in.

RPS 16: The operator shall have procedures for BVLOS operation to include

- Category A, direct control of remote pilot control of the UAS,
- Category B, autopilot control of remote pilot control of the UAS, and
- Category C, waypoint control of remote pilot control of the UAS.

RPS 17: The operator shall have UAS pilot handover procedures in line with the number, configurations, and locations of the RPS dedicated to the flight. It shall include a detailed handover briefing that is recorded in the flight documentation.

RPS 18: The operator shall have established emergency and contingency procedures to ensure the remote pilot:

- initiates procedures as outlined in the operations manual, while avoiding taking any action that would conflict with Air Traffic Control procedures, and
- conveys safety-related information to the mission, including information related to any changes to the flight plan that become necessary in the course of the UAS operation.

RPS 19: The operator shall have an UAS recovery process considering the following:

- environment,
- position,
- handling the UAS as per manufacture’s operating procedures, and
- coordination with Air Traffic Control.

RPS 20: The operator shall have a program to ensure UAS servicing and ground handling training for each staff member, as applicable to their duties and to the UAS type, to include:

- procedures for fueling,
- procedures for charging batteries,
- use and installation of protective covers, and
- procedures for operating in cold weather such as:
- moving the UAS or other components of the UAS from a warm facility when precipitation or high humidity is present,

- engine pre-heat procedures including proper use of related equipment; and
- managing battery degradation.

RPS 21: The operator shall have a refueling process for the safe operation of the UAS.

3.3 Payload

PYL 1: The operator shall have a process to ensure that the UAS payload operator is:

- trained,
- duly licensed,
- familiar with the UAS payloads,
- knowledgeable of UAS limitations, and
- of the airspace and other operational requirements.

PYL 2: The operator shall have procedures to address any risks associated with the remote pilot holding a dual role (e.g., the UAS pilot is also the payload operator).

PYL 3: The operator shall have a maintenance system for Intelligence, Surveillance, and Reconnaissance (ISR) payloads, which follows the specifications of the manufacturer's recommendations while ensuring safety and quality in maintenance operations.

PYL 4: The operator's internal audit process (per QMS) shall include ISR payloads maintenance activities.

PYL 5: The operator shall have a process to ensure that personnel conducting maintenance operations on ISR payloads are appropriately licensed, qualified and receive appropriate training.

PYL 6: The operator shall have a process for separating serviceable from non-serviceable parts of ISR payloads, as well as establishing a protected quarantine zone for rejected parts and equipment awaiting disposition.

PYL 7: The operator shall have procedures concerning payload limitations for:

- limits differing for aircraft and payload,
- dangerous payloads, and
- secondary purposes of payload.

3.4 Command and Control (C2) Link

CCL 1: The operator shall have a process to receive and manage the company frequency band plan for C2 link utilization that is approved by the competent authority.

CCL 2: The operator shall have a process to ensure that the command-and-control C2 link service provider shall commit to provide the required communication performance (RCP).

CCL 3: The operator shall have a procedure to receive notification in due time from the C2 link service provider in case of degradation of communication performance.

CCL 4: The operator shall have a process to ensure that the C2 link service provider is acceptable to the State of Registry.

CCL 5: The operator shall have a process to ensure that operational communications supporting the UASS functions are conducted in accordance with the C2 link RCP in an acceptably safe manner in a given operational environment.

CCL 6: The operator shall have a process for redundant C2 link utilization including procedures for :

- cold standby,
- hot standby, and
- dual operation.

CCL 7: The operator shall have a process to ensure that the UAS uses data links that meet communication transaction time, continuity, availability, and integrity levels appropriate for the airspace and operation.

CCL 8: The operator shall have a process to ensure that the spectrum of the C2 link is protected from harmful interference, which could affect the availability, continuity, and integrity of the information being transmitted between the RPS and the UAS.

CCL 9: The operator shall have a process to ensure that the UASS design and operating procedures is such that either:

- the loss of the C2 link will not lead directly to injury to people or damage to property, and
- the probability of loss of the C2 link should be lower than the allowed probability of injury to people or damage to property.

CCL 10: The operator shall have a process to ensure that the UAS design and operating procedures will:

- reduce the risk of an interruption in C2 link data flow,
- provide the UAS remote pilot with a continuous indication of the operational status of all C2 links, and
- allow to assess that no harmful (Radio Frequency) RF interference is present prior to and during flight.

CCL 11: The operator shall have procedures addressing contingency situations when loss of the C2 link or its degradation is such that normal flight can no longer be assumed.

CCL 12: The operator shall have procedures addressing contingency situations when the C2 link is recovered after the lost C2 link procedure was initiated.

3.5 Operational Security (SEC)

SEC 1: The operator shall have a process to ensure that its premises will be fit for the safe and secure implementation and control of all missions and activities to include:

- proper ground handling facilities,
- maintenance facilities at the Main Operating Base (MOB),
- suitable storage, shipment, power source and other devices for its portable RPS,
- adequate power supply equipment for the fixed RPS, and
- at each operating base, adequate working space for personnel involved in the safety of UASS operations e.g., remote crew, ground, maintenance and operational staff.

SEC 2: The operator shall have a process to ensure that a flight will not be commenced unless sufficient supplies, including water, provisions, and facilities for physiological needs are available to the UASS crew members.

SEC 3: The operator shall have a process to ensure security and protection from damage, alteration and theft of stored items, to include:

- technical data, equipment, tools and material, and
- storage of parts.

3.6 Qualification and Training

QTR 1: The operator shall establish a UASS qualification and training program in order for remote flight crews, UAS observers, ground station technicians, maintenance staff, and other ground support crew, to acquire, maintain, and continuously improve their knowledge and skills necessary for the planned tasks and activities to be conducted in accordance with the company requirements.

QTR 2: The operator's qualification and training program shall have a process for maintaining qualification and training records of remote flight crews, UAS observers, ground station technicians, and other ground support crew, as well as maintenance staff.

QTR 3: The operator's qualification and training program shall have procedures for training course planning, preparation, conduct, and examination.

QTR 4: The Operator's qualification and training program shall have procedures for the conduct of:

- Operator familiarization training course,
- conversion training course,
- initial and recurrent training courses per RPS types operated, that is to include abnormal and emergency situations,
- initial and recurrent training courses per UAS types operated, that is to include abnormal and emergency situations, and
- remote flight crew coordination and handover procedures.

QTR 5: The operator shall have procedures for the familiarization of aerodromes, routes, and operating sites to be used by its UASS flight crews.

QTR 6: The operator's qualification and training program shall have procedures for UASS crew resource management (CRM) training for UASS crewmembers. The UASS CRM training course shall include but is not limited to the following topics:

- communication,
- threat and error management,
- maintenance of situational awareness,
- human performance and behavior,
- ergonomics, and

- fatigue-related risks and countermeasures.

QTR 7: The operator's qualification and training program shall have a process to ensure that UASS members who are assigned to operate at different positions at the RPS, complete appropriate training and checking.

QTR 8: The operator shall have a process to ensure that each UASS crewmember undergoes UASS flight training in a Flight Simulation Training Device (FSTD) or in segregated airspace, or a combination of both, at least every 12 calendar months, unless differently approved by the competent authority.

QTR 9: The operator shall have a process to ensure that the UASS crewmembers whose duties include communication with ATC, demonstrate the level specified in the English language proficiency requirements in ICAO Appendix 1 to Annex 1.

3.7 Standard Operating Procedures (SOP)

SOP 1: The operator shall have procedures for integrating the UAS into non-segregated airspace and at aerodromes, by limiting the risk from the following hazards:

- conflicting traffic,
- terrain and obstacles,
- hazardous meteorological conditions (i.e., thunderstorms, icing, turbulence, etc.),
- ground operations (aircraft, vehicles, structures or people on the ground), and
- other airborne hazards, including wake turbulence, wind shear, birds or volcanic ash.

SOP 2: The operator shall have a process to ensure that the detectability and conspicuity of UAS is sufficient to ensure timely identification and detection by other airspace users and Air Traffic Control during all phases of flight.

SOP 3: The operator shall have a process to ensure that the "Detect and Avoid" (DAA) System including its Remain-well-clear (RWC) function is approved by the State of Registry and that the System covers at least Detect and Avoid, Detect and Advise or Detect and Inform functions.

SOP 4: The operator shall have detailed normal and emergency procedures associated to its "Detect and Avoid" (DAA) System alerting the UAS remote pilot of imminent collisions.

SOP 5: The operator shall have a process to ensure communication backup with Air Traffic Control in case of UAS relay communication failure.

SOP 6: The operator shall have a process that addresses actions to be taken in the event of a complete radio failure (lost communication).

SOP 7: The operator shall have a process to ensure regular oversight of contracted C2 link service provider (whether offering ground network, satellite communications (SATCOM) or combination of both), to verify the minimum standards and RCP are maintained.

SOP 8: The operator shall have a procedure that requires the UAS flight crews to maintain continuous listening watch on the appropriate radio frequency and establish two-way communication, as necessary, with the appropriate Air Traffic Control.

SOP 9: The operator shall have a procedure to ensure that an up-to-date communications list is kept in the RPS detailing the frequencies of all likely Air Traffic Control and agencies concerned in the conduct of the flights.

SOP 10: The operator shall have procedures to ensure that the UAS flight crews continuously monitor navigational equipment and performance.

SOP 11: The operator shall have a process to ensure that up-to-date information is readily available to all UAS flight crews, to include as a minimum:

- relevant runway data,
- aerodrome facilities, and
- site facilities.

SOP 12: The operator shall have procedures for approach, missed approach, and departure.

SOP 13: The operator shall have procedures for automated launch and system recovery.

SOP 14: The operator shall have a coordination process in the event of loss of downlink data between the Operator and Air Traffic Control.

SOP 15: The operator shall have procedures for the safe transport of Dangerous Goods (DGR) by air according to ICAO Annex 18, to include all applicable DGR training and qualification requirements.