

# **Military Aviation Requirements - Operations**

## **MAR-OPS 4**

### **Remotely Piloted Aircraft Systems Operations (>150kg)**

Military Aviation Authority – The Netherlands

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## Status page

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## **Terminology and Abbreviations**

Terms and abbreviations used in this MAR-OPS 4 are explained in the MAR-11.

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## SUBPART A – Applicability and entry into force

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### **MAR-OPS 4.001 *Applicability and entry into force***

- (a) The MAR-OPS 4 prescribes requirements and conditions applicable to the operation of any Remotely Piloted Aircraft System (RPAS) with a maximum take off weight of more than 150 kg, operated by Netherlands military Operators:
- (1) Having a motorized Remotely Piloted Aircraft (RPA); and
  - (2) Having three dimensional freedom of movement by remote control (e.g. the ability to climb, descend and turn).
- (b) This requirement shall enter into force on the day of signing by the Director of the Military Aviation Authority of the Netherlands. Operators who are in the process for certification for a Military Air Operator certificate will only be issued a certificate when they comply with this requirement. Operators certified as Military Air Operator need to show compliance, including adapting their (safety) management system, no later than 01 January 2019.

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## SUBPART B – General

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## **MAR-OPS 4.002 Privileges**

The holder of a MAOC based on MAR-OPS 4 is privileged to conduct RPAS operations in accordance with terms and conditions of the MAOC.

## **MAR-OPS 4.003 Responsibilities**

- (a) The requirements in this MAR-OPS do not absolve any person from using their best judgement to ensure the safety of the aircraft, personnel and surroundings. Where safety or operational imperatives demand, the requirements may be deviated from provided that a convincing case can be offered in retrospect. Where authorized individuals issue their own amplifying orders or instructions, they must be based on these requirements and on a sound risk analysis.
- (b) Nothing in these requirements shall exonerate an accountable manager, postholder, pilot in command, crewmember or other operations personnel from the consequences of any neglect to comply with these requirements, or of the disregard of any precaution which may be required by the ordinary practise of airmen, or by the special circumstances of the case.
- (c) In construing and complying with these requirements due regard shall be had to any special circumstances, including those originating from the specific military context, which may make a deviation from the requirements necessary to avoid immediate danger.

## **MAR-OPS 4.005 General**

- (a) The Operator shall operate any RPAS listed on his MAOC in accordance with this MAR-OPS 4.
- (b) The Operator shall ensure that at all times clear and unambiguous instructions are issued to all crew members regarding the requirements, procedures and conditions applicable to the operation to be conducted. These instructions shall be substantiated by a formal authorization.
- (c) For requirements in this MAR-OPS 4 that require alternative implementation by an Operator -if deemed necessary 'due to the nature of the operation'- the Operator shall include a verifiable decision-making procedure in his Operations Manual.
- (d) For requirements in this MAR-OPS 4 that allow alternative implementation by an Operator if deemed necessary 'due to the nature of the operation', the Operator shall include a verifiable decision-making procedure in his Operations Manual.
- (e) The Operator shall operate any RPAS in compliance with the terms of its Certificate of Airworthiness (or equivalent alternative airworthiness document allowable to the Military Aviation Authority (MAA-NLD)) and within the approved limitations contained in the System Flight Manual (SFM).
- (f) All synthetic training devices (STD) replacing a RPA(S) for training and/or checking purposes are to be approved by the MAA. Approval can be obtained by following the recommendations as written down in the Advisory Circular-FSTD or equivalent.

## **MAR-OPS 4.010 Exemptions**

- (a) When satisfied that there is a need the MAA-NLD may exceptionally and temporarily grant an exemption from the provisions of MAR-OPS 4. The exemption may include

any supplementary condition the MAA-NLD considers necessary in order to ensure an acceptable level of safety in the particular case.

- (b) When the Operator has a need to deviate from any MAR-OPS 4 requirement, a petition for exemption from the specific requirement shall be submitted to the MAA-NLD in accordance with MAR-11. The formal MAA-NLD approval shall be obtained before deviating from the requirement.
- (c) When time does not permit compliance with sub-paragraph (b) above, deviation from specific MAR-OPS 4 requirements is only permitted in case of operational necessity and shall be based on an operational risk assessment. Subsequently, the Operator shall ensure that a report is submitted to the MAA-NLD as soon as possible, describing the:
  - (1) MAR-OPS 4 requirements deviated from;
  - (2) Operational circumstances and necessity to deviate;
  - (3) Results from the operational risk and or safety assessment; and
  - (4) Any supplementary conditions and or measures applied.

#### ***MAR-OPS 4.015 Operational Directives***

- (a) The MAA-NLD may direct by means of an Operational Directive that an operation shall be prohibited, limited or subject to certain conditions, in the interests of safe operations (reference MAR-11).
- (b) Operational Directives state:
  - (1) The reason for issue;
  - (2) Applicability and duration; and
  - (3) Action required by the Operator.
- (c) Operational Directives are supplementary to the provisions of this MAR-OPS 4.

### ***MAR-OPS 4.020 Laws, regulations and procedures – Operator’s responsibilities***

The Operator shall ensure that:

- (a) All operations personnel are made aware that they shall comply with the laws, regulations and procedures of those States in which operations are conducted and which are pertinent to the performance of their duties; and
- (b) Crew members are familiar with the laws, regulations and procedures pertinent to the performance of their duties.

### ***MAR-OPS 4.025 Common language***

- (a) The Operator shall ensure that all crew members are able to communicate in a common language.
- (b) The Operator shall ensure that all operations personnel are able to understand the language in which those parts of the Operations Manual which pertain to their duties and responsibilities, are written.

### ***MAR-OPS 4.030 Minimum Equipment List***

(See appendix 1 to MAR-OPS 4.030 MEL – application and usage)

- (a) The Operator shall:
  - (1) Apply and use the MEL in accordance with appendix 1 to this MAR-OPS 4 requirement.
- (b) The Operator shall not operate a RPAS:
  - (1) Other than in accordance with the applicable MEL unless permitted by the MAA-NLD; or
  - (2) After expiry of the Rectification interval (RI) specified in the applicable MEL, unless:
    - (i) The defect has been rectified; or
    - (ii) The RI is extended in accordance with appendix 1 to this MAR-OPS 4 requirement.
- (c) Where there is a conflict between the MEL and an Airworthiness Directive or any other mandatory requirement issued by the MAA-NLD, the data or information contained in the Airworthiness Directive or the mandatory requirement shall prevail.

## **MAR-OPS 4.034 Managerial requirements**

- (a) The Operator shall set up and manage its organisation according to a structure that supports the safe, efficient and continuous provision of flight operations under the terms of this MAR-OPS.
- (b) The Operator shall setup a management structure that ensures at least the following:
- (1) An accountable manager is appointed who, on behalf of the organisation, has corporate authority to ensure that all required activities can be carried out to the standard required by this MAR-OPS. The accountable manager shall:
    - (i) establish and promote the management systems specified in MAR-OPS 4.035 & 4.037;
    - (ii) ensure that, in support of the Operator's approval, all necessary resources are available to accomplish the activities; and
    - (iii) demonstrate a basic understanding of the MAR-OPS;

- (2) A quality manager is appointed with the responsibility for monitoring the quality management system, including the associated feedback system as required by MAR-OPS 4.035. The appointed person shall have direct access to the accountable manager to ensure that the accountable manager is kept properly informed about issues related to quality and compliance. The appointed person shall have access to all parts of the organisation and, as applicable, any (sub)contracted organisation;

For flight operations under the terms of this MAR-OPS, the MAA-NLD may accept the nomination of two quality manager functions, one for operations and one for maintenance management, provided that the quality system is applied uniformly throughout the entire operation.

- (3) A safety manager is appointed responsible to monitor compliance with, and adequacy of, procedures to ensure safe operational practices. The appointed person shall have direct access to the accountable manager to ensure that the latter is kept properly informed about safety affairs, compliance and improvement measures;
- (4) Nominated postholders are appointed, whose job responsibilities includes ensuring that the organisation complies with this MAR-OPS. Such persons shall ultimately be responsible to the accountable manager. The nominated postholders:
  - (i) shall represent the management structure of the organisation;
  - (ii) shall be able to demonstrate relevant knowledge, background and satisfactory experience related to the flight operations executed under the terms of this MAR-OPS;
  - (iii) shall demonstrate a basic active understanding of this MAR-OPS;

For flight operations under the terms of this MAR-OPS, postholders responsible for the management and supervision of the following areas are required:

- (iv) Flight operations;
- (v) Maintenance management;
- (vi) Crew training; and
- (vii) Ground operations;

A person may hold more than one of these nominated posts if acceptable to the MAA-NLD, but a minimum of two persons are required to cover the four areas of responsibility.

(c) The organisational structure shall define:

- (1) The authority, duties and responsibilities of the accountable manager, the nominated post holders and in particular of the management personnel in charge of safety, quality, security and human resources related functions; and
- (2) The relationship and reporting lines between different parts and processes of the organisation.

(d) Personnel requirements:

- (1) The Operator shall employ appropriately skilled personnel to ensure the provision of its services in a safe, efficient and continuous manner;
- (2) The Operator shall have a man-hour plan showing that the organisation has sufficient personnel to plan, perform, supervise, inspect, and quality monitor the organisation in accordance with the approval;
- (3) The Operator shall have a procedure to reassess work intended to be carried out when actual staff availability is less than the planned staffing level for any particular work shift or period or the work load is higher than expected;
- (4) The Operator shall establish and control the competence of all personnel involved in provision of its services in accordance with a procedure and to a standard acceptable to the MAA-NLD. In addition to the necessary expertise related to the job function, the competence must include an understanding of the application of human factors and human performance issues appropriate to that person's function in the organisation;
- (5) The Operator shall ensure that all personnel receive sufficient and appropriate continuation training according with a procedure and standard acceptable to the MAA-NLD; and
- (6) The Operator shall ensure that technical personnel including personnel of subcontracted operating organisations who operate and maintain equipment approved for its operational use have and maintain sufficient knowledge and understanding of the services they are supporting, of the actual and potential effects of their work on the safety of those services, and of the appropriate working limits to be applied.

### **MAR-OPS 4.035 Quality system**

(a) The Operator shall develop a functional and effective system to manage quality such that it assures that products and services meet the required specification.

(b) The system shall include the following:

- (1) A quality policy that meets the needs of different users as closely as possible;
- (2) Procedures, taking into account human factors and human performance, to ensure good practices and compliance with this MAR-OPS. The procedures developed or to be developed shall address all aspects dealing with the performance of the activities and shall contain the standards which the organisation intends to meet;

- (3) Independent checks, by means of audits, inspections, or investigations, in order to ensure the required standards and the adequacy of procedures according to this MAR-OPS;
  - (4) A quality feedback reporting system to the nominated postholder and ultimately to the accountable manager that ensures proper and timely corrective actions are taken in response to reports resulting from the independent checks performed; and
  - (5) Documentation and registration system.
- (c) The Operator shall describe the system and procedures in the Operations Manual or Organisation Exposition.
  - (d) The Operator shall provide and keep up-to-date Operations Manuals relating to the provision of its services for the use and guidance of operations personnel. The Operator shall ensure that:
    - (1) Operations manuals contain instructions and information required by operations personnel to perform their duties;
    - (2) Relevant parts of the Operations Manuals are accessible to the personnel concerned; and
    - (3) Operations personnel are expeditiously informed of the amendments to the operations manual applying to their duties as well as of their entry into force.

### **MAR-OPS 4.036 Sub-contracting**

- (a) The Operator may make arrangements with a sub-contractor organization to carry out any task and or activity within the scope of its MAOC.
- (b) Arrangements between the Operator and a sub-contractor organization as mentioned in sub-paragraph (a) above, including all amendments to it, shall:
  - (1) Be in the form of a verifiable agreement acceptable to the MAA-NLD;
  - (2) Clearly define the products and or services and quality to be provided; and
  - (3) Clearly define the sub-contractor's authorization and approval required to conduct the sub-contracted task and or activity.
- (c) The ultimate responsibility for the product and or service provided by the sub-contractor always remains with the Operator. Therefore the Operator shall ensure that:
  - (1) The sub-contractor's safety related activities relevant to the agreement shall be included in the Operator's quality monitoring program;
  - (2) The sub-contractor has the necessary authorization and approval to conduct to sub-contracted tasks and or activities;
  - (3) The sub-contractor commands the resources and has the competence to conduct the sub-contracted tasks and or activity; and

- (4) In the event that the Operator requires the sub-contractor to conduct activities which exceed the sub-contractor's authorization and approval, the sub-contractor's quality assurance takes account of additional requirements.

### **MAR-OPS 4.037 Safety Management System**

- (a) The Operator shall develop an effective, explicit and proactive system to manage safety that comprises the following components:
- (1) Safety policy and objectives;
  - (2) Safety assurance providing continuous monitoring and regular analysis of the safety level achieved;
  - (3) Risk management to identify hazards and to ensure that remedial actions necessary to maintain an acceptable level of safety are implemented; and
  - (4) Safety improvement aiming to make continuous improvement to the overall level of safety.
- (b) Regarding safety policy and objectives, the system shall contain the following elements:
- (1) A statement of the safety policy defining the Operator's fundamental approach to managing safety;
  - (2) Safety strategy and planning, such as setting safety performance targets, allocating priorities for implementing safety initiatives and ensuring that the principal safety objective is to minimise the organisation's contribution to the risk of a RPA(S) accident as far as reasonably practicable.
- (c) Regarding safety assurance, the system shall contain the following elements:
- (1) Staff training and competence, including the review and evaluation of the adequacy of training provided to staff on safety-related duties;
  - (2) Documentation, registration and monitoring of all safety-related infrastructure, facilities and equipment;
  - (3) The enforcement of an adequate justification of the safety of the externally provided services and supplies; and
  - (4) Safety surveys that are carried out as a matter of routine, to recommend improvements where needed, to provide assurance to managers of the safety of activities within their areas and to confirm compliance with the relevant parts of the safety management system.
- (d) Regarding risk management, the system shall contain the following elements:
- (1) Registration, analysis, and handling of accidents, incidents, defects, faults, and discrepancies, including internal and external complaints with respect to safety, and ensure that any necessary corrective action is taken;
  - (2) Demonstration of the implementation of the requirements on the reporting and assessment of safety occurrences in accordance with applicable national and international law and SMAR-1;

- (3) The identification, assessment and mitigation of risks to an appropriate level to ensure that due consideration is given to all aspects of the provision of its services including for changes to the functional system;
  - (4) Methods are in place to detect changes in functional systems or operations which may suggest any element is approaching a point at which the acceptable level of safety can no longer be met, and that corrective actions have to be taken;
  - (5) A flight data monitoring program which shall be systematic and allow pro-active use of (digital) flight data from routine operations to improve aviation safety within an intrinsically non-punitive and just Safety Culture. This flight data monitoring program shall contain adequate safeguards to protect the source(s) of the data and shall allow the Operator to:
    - (i) Identify areas of operational risk and quantify current safety margins;
    - (ii) Identify and quantify changing operational risks by highlighting when nonstandard, unusual or unsafe circumstances occur; and
    - (iii) Use the flight data monitoring program information on the frequency of occurrence, combined with an estimation of the level of severity, to assess the safety risks and to determine which are or may become unacceptable if the discovered trend continues; and
    - (iv) Put in place appropriate risk mitigation to provide remedial action once an unacceptable risk (either actually present or predicted by trending) has been identified; and
    - (v) Confirm the effectiveness of any remedial action by continued monitoring.
- (e) Regarding safety improvement, the system shall contain the following elements:
- (1) All personnel is aware of the potential safety hazards connected with their duties;
  - (2) The lessons arising from safety occurrence investigations and other safety activities are disseminated within the organisation at management and operational levels;
  - (3) All personnel is actively encouraged to propose solutions to identified hazards, and changes are made to improve safety where they appear needed.
- (f) The Operator shall systematically document the safety management system in the Operations Manual or Organisation Exposition in a manner which provides a clear linkage to the organisation's safety policy.
- (g) Accident and incident data requirements specified in MAR-OPS 4.160 shall take precedence over the requirements of a flight data monitoring program. In these cases the recorded data shall be retained as part of the investigation data, regardless of the Operators de-identification policy regarding the flight data monitoring program.

### **MAR-OPS 4.039 Facilities**

- (a) The Operator shall ensure that operational and ground handling facilities are appropriate for the area and type of operation and ensure the safe handling of its flights.
- (b) The Operator shall provide sufficient and suitable office accommodation at appropriate locations for all operations personnel. Consideration must be given to the needs of ground staff, those concerned with exercising control over daily operations, the storage and display of essential records, and flight planning by crew members.
- (c) Office services must be capable, without delay, of distributing operational instructions and other information to all concerned.
- (d) Infrastructure such as antenna's, power supply required for the operation of RPAS shall be sufficient and appropriate to ensure safe handling of all flights.

### **MAR-OPS 4.040 Crew members**

- (a) The Operator shall ensure that crew members have been trained in, and are competent to perform, their assigned duties.
- (b) The Operator shall specify in the Operations Manual the qualifications crew members, their corresponding duties and responsibilities, and their continuation and checking program.

### **MAR-OPS 4.085 Crew responsibilities**

- (a) A crew member shall be responsible for the proper execution of his/her duties which are:
  - (1) Related to the safety of the RPAS; and
  - (2) Specified in the instructions and procedures laid down in the Operations Manual.
- (b) A crew member shall:
  - (1) Report to the RPAS Commander (RPAS Cdr) any fault, failure, malfunction or defect which he believes may affect the airworthiness or safe operation of the RPAS;
  - (2) Report to the RPAS Cdr any incident that endangered, or could have endangered, the safety of operation; and
  - (3) Make use of the Operator's occurrence reporting schemes in accordance with MAR-OPS 4.037(d). In all such cases, a copy of the report(s) shall be communicated to the RPAS Cdr concerned.
- (c) Nothing in paragraph (b) above shall oblige a crew member to report an occurrence which has already been reported by another crew member.
- (d) A crew member shall not perform duties:

- (1) While under the influence of any substance that may affect his/her capabilities in a manner contrary to safety;
  - (2) After blood donation until 24 hours have elapsed;
  - (3) If he/she is in any doubt of being able to accomplish his/her assigned duties; or
  - (4) If he/she knows or suspects that he/she is suffering from fatigue, or feels unfit to the extent that the flight may be endangered.
- (e) A crew member shall not:
- (1) Consume alcohol less than 10 hours prior to the specified reporting time for duty or the commencement of standby;
  - (2) Commence a duty period with a blood alcohol level in excess of 0,2 promille; and/or
  - (3) Consume alcohol during the duty period or whilst on standby.
- (f) The RPAS Cdr shall:
- (1) Be responsible for the operation and safety of the RPAS from the moment he accepts the RPAS for operations until he releases the RPAS back to maintenance;
  - (2) Have authority to give all commands he deems necessary for the purpose of securing the safety of the RPAS;
  - (3) Ensure that all operational procedures and checklists are complied with in accordance with the Operations Manual;
  - (4) Not permit the flightcrew to perform any activity during take-off, initial climb, final approach and landing except those duties required for mission execution and the safe operation of the RPAS;
  - (5) Not permit, unless necessary for reasons of military security, the recording equipment (reference MAR-OPS 4.727) to be disabled, switched off or erased during flight nor permit recorded voice communications and/or flight data to be erased after flight in the event of an accident or an incident subject to mandatory reporting;
  - (6) Decide whether or not to accept a RPAS with unserviceabilities allowed by the Configuration Deviation List ( CDL) (if available) or MEL for the applicable RPAS type;
  - (7) Ensure that the applicable inspections have been carried out; and
  - (8) Ensure that handover of the control of the RPAS or RPA from one crew to another does not have a negative impact on the safe operation of the RPAS.

### **MAR-OPS 4.090 Authority of the RPAS Cdr**

The Operator shall take all reasonable measures to ensure that ground staff, involved in ground operations, obey all lawful commands given by the RPAS Cdr for the purpose of securing the safe operation of the RPAS.

### ***MAR-OPS 4.120 Endangering safety***

The Operator shall take all reasonable measures to ensure that no person recklessly or negligently acts or omits to act, so as to:

- (a) Endanger a RPAS; or
- (b) Cause or permit a RPAS to endanger any person or property.

### ***MAR-OPS 4.121 RPAS protection***

The Operator shall establish protective measures and security procedures in the Operations Manual to ensure that the RPAS, when not operated, are protected against unlawful interference such as sabotage.

### ***MAR-OPS 4.122 Flight and duty time limitations and minimum periods of rest***

The Operator shall include in the Operations Manual an arrangement for flight and duty time limitations and minimum periods of rest for all operations personnel. This arrangement shall be compliant with the Dutch Working Hour Act (ATW) and the subsidiary Working Hours Decree (ATB) and General Military Officials Regulations (AMAR).

### ***MAR-OPS 4.125 Documents to be available***

- (a) Unless it is undesirable for reasons of military security:
  - (1) The Operator shall ensure that the following documents or copies thereof are available to the RPAS Cdr in hardcopy or any other form acceptable to the MAA-NLD:
    - (i) The Certificate of Registration;
    - (ii) The Certificate of Airworthiness (if applicable);
    - (iii) The Noise Certificate (if applicable); and
    - (iv) The RPAS Radio Station licence (if applicable).
  - (2) Each flightcrew member shall carry a valid licence with appropriate rating(s) for the purpose of the flight and a valid Military Medical Certificate.
- (b) The Operator shall include a procedure in the Operations Manual by which the prevailing security situation as meant by sub-paragraph (a) above has to be assessed.

### **MAR-OPS 4.130 Checklists to be available**

- (a) The Operator shall ensure that RPIL's operating a RPAS have access to all relevant normal and emergency operating procedures as laid down in the latest version of the System Flight Manual and the Operations Manual.
- (b) The MAA-NLD may permit the information detailed in sub-paragraph (a) above, or parts thereof, to be presented in a form other than on printed paper. An acceptable standard of accessibility, usability and reliability must be assured.

### **MAR-OPS 4.135 Additional information and documentation to be available**

- (a) Unless it is undesirable for reasons of military security, the Operator shall ensure that, in addition to the documents and checklists prescribed in MAR-OPS 4.125 and MAR-OPS 4.130, the following information and documentation, relevant to the type and area of operation, are available during each flight:
  - (1) Mission essential information documentation containing at least the information required in MAR-OPS 4.1060(a);
  - (2) RPAS Technical Log(s) containing at least the information required in MAR-OPS 4.920(a);
  - (3) Mass and balance documentation as specified in MAR-OPS 4 subpart J;
  - (4) Current maps and charts and associated documentation as prescribed in MAR-OPS 4.290(b)(5); and
  - (5) Any other documentation required by the States concerned with this flight.
- (b) The MAA-NLD may permit the documentation and information detailed in sub-paragraph (a) above, or parts thereof, to be presented in a form other than printed paper.
- (c) The Operator shall include a procedure in the Operations Manual by which the prevailing security situation as meant by sub-paragraph (a) has to be assessed.

### **MAR-OPS 4.140 Information to be retained**

- (a) The Operator shall ensure that:
  - (1) The information is retained until it has been duplicated at the place at which it will be stored in accordance with MAR-OPS 4.1065.
- (b) The information referred to in sub-paragraph (a) above includes, at least a copy of:
  - (1) Mission essential information documentation where appropriate;
  - (2) Relevant part(s) of the RPAS Technical Log;
  - (3) Mass and balance documentation (if applicable); and
  - (4) Any other documentation required by the States concerned with this flight.

### ***MAR-OPS 4.145 Power to inspect***

The Operator shall ensure that any person authorised by the MAA-NLD is permitted at any time to inspect any RPAS component operated in accordance with a MAOC issued by that MAA-NLD, provided that the RPAS Cdr may refuse access to the Remote Pilot Station (RPS) if in his/her opinion the safety of the RPA, operation or third party would thereby be endangered.

### ***MAR-OPS 4.150 Production of documentation and records***

(a) The Operator shall:

- (1) Give any person authorized by the MAA-NLD access to any documents and records as prescribed by this MAR-OPS 4; and
- (2) Produce all such documents and records, when requested to do so by the MAA-NLD, within a reasonable period of time.

(b) The RPAS Cdr shall within a reasonable time produce to a person authorized by the MAA-NLD, the documentation required to be available.

### ***MAR-OPS 4.160 Preservation, production and use of recorded flight data and voice communications***

(a) Preservation of recordings: (reference MAR-OPS 4.727)

- (1) Following an accident the Operator shall, to the maximum extent possible, preserve the original recorded data pertaining to that accident as retained by the recording equipment for a period of 60 days, unless otherwise directed by the investigating authority;
- (2) Following an incident that is subject to mandatory reporting the Operator shall, to the maximum extent possible, preserve the original recorded data pertaining to that incident as retained by the recording equipment for a period of 60 days, unless otherwise directed by the investigating authority;
- (3) Additionally, when the MAA-NLD so directs, the Operator shall preserve the original recorded data as retained by the recording equipment for a period of 60 days unless otherwise directed by the investigating authority; and

(4) The Operator shall for each individual RPAS:

- (i) Save recordings as retained by the recording equipment for the period of operating time except that, for the purpose of testing and maintaining recording equipment, up to one hour of the oldest recorded material at the time of testing may be erased; and
- (ii) Keep a document which presents the information necessary to retrieve and convert the stored data into engineering units.

(b) Production of recordings. The Operator shall, within a reasonable time after being requested to do so by the MAA-NLD, produce any recording made by the recording equipment which is available or has been preserved.

(c) Use of recordings:

(1) The recorded voice communications may not be used for purposes other than for the investigation of an accident or incident subject to mandatory reporting except with the consent of all crew members concerned or for the purpose of operational debriefing;

(2) The recorded flight data may not be used for purposes other than for the investigation of an accident or incident subject to mandatory reporting except when such records are:

(i) Used by the Operator for safety management, airworthiness or maintenance purposes only;

(ii) Disidentified; or

(iii) Disclosed under secure procedures.

#### **MAR-OPS 4.165 Leasing – transfer of RPAS (or RPAS component)**

(a) Leasing - transfer of RPAS (or RPAS Component) - between MAR-OPS approved Operators:

(1) Wet lease-out. An Operator providing a RPAS (or RPAS component) and flight crew to another Operator, and retaining all the functions and responsibilities related to his MAOC, shall remain the Operator of the RPAS (or RPAS component);

(2) All leases except wet lease-out:

(i) Except as provided by sub-paragraph (a)(1) above, an Operator utilising a RPAS (or RPAS component) from, or providing it to, another MAR-OPS approved Operator, must obtain prior approval for the operation from the MAA-NLD. Any conditions which are part of this approval must be included in a formal verifiable agreement; and

(ii) Those elements of formal agreements concerning the transfer of RPAS (or RPAS component) which are approved by the MAA-NLD, other than formal agreements in which a RPAS and complete crew are involved and no transfer of functions and responsibilities is intended, are with respect to the transferred RPAS all to be regarded as variations of the MAOC under which the flights will be operated.

(b) Leasing – transfer of RPAS (or RPAS component) - between an Operator and any entity other than a MAR-OPS approved Operator:

(1) Dry lease-in:

(i) The Operator shall not dry lease-in a RPAS (or RPAS component) from an entity other than a MAR-OPS accredited Operator or an Operator organization within an aviation oversight system recognised by the MAA-NLD, unless approved by the MAA-NLD. Any conditions which are part of this approval

must be included in the formal verifiable agreement concerning the transfer of RPAS (or RPAS component); and

- (ii) The Operator shall ensure that, with regard to RPAS (or RPAS components) that are dry leased-in, any differences from the requirements prescribed in MAR-OPS 4 subparts K and L, if applicable, are notified to and are acceptable to the MAA-NLD.

(2) Wet lease-in:

- (i) The Operator shall not wet lease-in a RPAS (or RPAS component) from an entity other than a MAR-OPS accredited Operator or an Operator organization within an aviation oversight system recognised by the MAA-NLD, without the approval of the MAA-NLD; and
- (ii) The Operator shall ensure that, with regard to RPAS (or RPAS component) that are wet leased-in:
  - (A) The safety standards of the other Operator with respect to maintenance management and flight operations are equivalent to MAR-requirements; and
  - (B) Any requirement made applicable by the MAA-NLD is complied with.

(3) Dry lease-out:

- (i) The Operator may dry lease-out a RPAS (or RPAS component) to any Operator within an aviation oversight system recognised by the MAA-NLD, provided that the following conditions are met:
  - (A) The MAA-NLD has exempted the Operator from the relevant provisions of this MAR-OPS 4;
  - (B) The MAA-NLD has removed the applicable RPAS (or RPAS component) from its MAOC, after the recognised foreign military or civil regulatory authority has accepted responsibility in writing for surveillance of the maintenance and operation of the RPAS (or RPAS component); and
  - (C) A formal verifiable agreement between both Operators concerning the transfer of RPAS (or RPAS component) ensures that:
    - a) The RPAS (or RPAS component) is maintained according to the MAA-NLD approved RPAS (or RPAS component) Maintenance Program;
    - b) The maintenance organization contracted by the other Operator to conduct maintenance on a RPAS (or RPAS component) is obligated to use any applicable maintenance data submitted by the applicable (supplementary) type certificate holder;
    - c) The user requirements applicable to the other Operator, pertaining to the continuing airworthiness of the RPAS (or RPAS component), are not less restrictive than the applicable MAR-OPS 4 requirements; and
    - d) The transferred RPAS (or RPAS component) maintenance records will be kept up to date by the other Operator.

- (ii) The Operator may dry lease-out a RPAS (or RPAS component) to any Operator, provided that the following conditions are met:
  - (A) The MAA-NLD has exempted the Operator from the relevant provisions of MAR-OPS 4;
  - (B) The MAA-NLD has, after the applicable foreign maintenance and Operator organizations are accredited by the MAA-NLD, removed the applicable RPAS (or RPAS component) from its MAOC; and
  - (C) A formal verifiable agreement between both Operators concerning the transfer of RPAS (or RPAS component) ensures that:
    - a) The RPAS (or RPAS component) is maintained in accordance with a maintenance program approved by the MAA-NLD;
    - b) The maintenance organization contracted by the other Operator to conduct maintenance on a RPAS (or RPAS component) is obliged to use any applicable maintenance data submitted by the applicable (supplementary) type certificate holder;
    - c) The user requirements applicable to the other Operator, pertaining to the continuing airworthiness of the RPAS (or RPAS component), are not less restrictive than the applicable MAR-OPS 4 requirements; and
    - d) The transferred RPAS (or RPAS component) maintenance records will be kept up to date by the other Operator.
- (4) Wet lease-out. An Operator providing a RPAS and flight crew to another entity and retaining all the functions and responsibilities related to his MAOC, shall remain the Operator of the RPAS.

## **Appendix 1 to MAR-OPS 4.030 MEL – application and usage**

### (a) General:

- (1) The MEL is applicable up to the commencement of flight;
- (2) All items related to the type certificate of the RPAS type considered or required by operational regulations or the operating procedures as specified in the Operations Manual and not included in the MEL are automatically required to be operative; and
- (3) The Operator shall establish an effective decision making process in the Operations Manual for failures that are not listed to determine if they are related to the type certificate, operational regulations and or operational procedures in the Operations Manual.

### (b) Operational and maintenance procedures:

- (1) Operational procedures as specified in the MEL shall be accomplished in planning for and or operating with the listed item inoperative. These procedures shall be accomplished by the flight crew, however, the Operator may qualify and authorize other personnel to perform certain functions. The satisfactory accomplishment of all procedures, regardless of who performs them, is the responsibility of the Operator. Appropriate procedures with respect to the accomplishment of the mentioned operational procedures are required to be published as a part of, or referenced in, the Operations Manual;
- (2) Maintenance procedures as specified in the MEL shall be accomplished prior to operating with the listed item inoperative. These procedures shall be accomplished by appropriately licensed and authorized maintenance personnel. The satisfactory accomplishment of all maintenance procedures, regardless of who performs them, is the responsibility of the Operator. Appropriate procedures with respect to the accomplishment of the mentioned maintenance procedures are required to be published as a part of, or referenced in, the Operations Manual; and
- (3) When dispatching a RPAS, an inoperative item may not be removed from that RPAS, unless specifically permitted in the applicable maintenance procedures.

### (c) Rectification interval management programs:

- (1) The Operator shall establish an effective rectification program that includes tracking of the inoperative items and coordinating parts, personnel, facilities, and procedures in the Operations Manual necessary to ensure timely rectification within the specified RI; and
- (2) The Operator shall establish a program to reduce future unserviceabilities of MEL-items as much as possible based on analysis of historic trends in the occurrence of inoperative items and rectification times achieved.

### (d) Rectification interval extensions (RIE):

- (1) Subject to the approval of the MAA-NLD, the Operator may grant a one-time extension of the applicable RI's B, C or D for the same duration as specified in the MEL, provided:

- (i) The type certificate holder for the RPAS type has explicitly declared that RIE's have been taken into account in the determination of the RI's;
  - (ii) A completed MAA-NLD RIE request form (see MAA-NLD intranet website) is submitted to the MAA-NLD, including a motivation of the operational necessity and the actions taken to comply with sub-paragraph (d)(1)(iii) below; and
  - (iii) Rectification is accomplished at the earliest opportunity.
- (2) Subject to the approval of the MAA-NLD, the Operator may use an internal procedure for the extension of the applicable RI's B, C or D for the same duration as specified in the MEL, provided:
- (i) The type certificate holder for the RPAS type has explicitly declared that RIE's have been taken into account in the determination of the RI's;
  - (ii) A description of specific duties and responsibilities for controlling extensions is established by the Operator and accepted by the MAA-NLD;
  - (iii) The Operator only grants a one-time extension of the applicable RI;
  - (iv) The MAA-NLD is notified on a monthly basis of all extensions granted including a motivation of the operational necessity and the actions taken to comply with sub-paragraph (d)(2)(v) below, in a format acceptable to the MAA-NLD; and
  - (v) Rectification is accomplished at the earliest opportunity.
- (e) Procedures related to MEL application and usage:
- (1) The Operator shall establish procedures in the Operations Manual acceptable to the MAA-NLD, regarding:
- (i) The accomplishment of operational and maintenance procedures as specified in the MEL;
  - (ii) RI management programs;
  - (iii) RIE's;
  - (iv) The deferral of MEL items, comprising a method for:
    - (A) Deferral and or rectification of inoperative equipment;
    - (B) Placarding of items as required in the MEL;
    - (C) Dispatching of RPAS with deferred MEL items;
    - (D) Using a remote deferral system; and
    - (E) Controlling the deferral times.
  - (v) The review of deferred MEL items by the maintenance management and flight operations departments, in order to ensure that accumulated deferred items neither conflict with each other nor present an unacceptable increase in the workload of the flight crew or mission essential crew members.

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## SUBPART C – Operator certification

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### **MAR-OPS 4.175 General rules for MAR-OPS certification**

- (a) The Operator shall not operate a RPAS otherwise than under and in accordance with the terms and conditions of his MAOC and applicable Special Approvals.
- (b) An applicant for a MAOC or a variation on an issued MAOC shall allow the MAA-NLD to examine all safety aspects of the operation or proposed change(s).
- (c) The Operator shall grant the MAA-NLD access to his organization and RPAS and shall ensure that, with respect to maintenance, access is granted to any contracted maintenance organization in order to determine continued compliance with this MAR-OPS 4.
- (d) Notwithstanding the provisions of MAR-OPS 4.185(g), the Operator must notify the Military Aviation Authority as soon as practicable of any changes to the information submitted in accordance with MAR-OPS 4.185(a).

### **MAR-OPS 4.185 Application for a MAOC, a variation on or a renewal of an issued MAOC**

- (a) The Operator shall ensure that the following information is included in the initial application for a MAOC and, when applicable, any variation or renewal applied for:
  - (1) The official name, contact information and business location(s) of the applicant;
  - (2) A description of the scope of operation applied for, to include any required Special Approval, if applicable;
  - (3) A description of the operational environment(s);
  - (4) A description of the management organization;
  - (5) The nominated function and name of the designated person to fulfil the function of accountable manager;
  - (6) The nominated function(s) and name(s) of the designated person(s) to fulfil the function of quality manager;
  - (7) The nominated functions and names of the designated persons to fulfil the function of major post holders, including those responsible for flight operations, the maintenance system, crew training and ground operations;
  - (8) The RPAS type(s) and variants to be operated; and

- (9) Registration marking(s).
- (b) The Operator shall ensure that the following documentation is included in the initial application for a MAOC and, when applicable, any variation or renewal applied for:
- (1) Operations Manual, Part A;
  - (2) Operations Manual, Part B for each RPAS type to be operated;
  - (3) Operations Manual, Part C, if applicable;
  - (4) Operations Manual, Part D;
  - (5) Operations Manual, Part E;
  - (6) Operations Manual, Part F;
  - (7) The Operator's customized Maintenance Program, for each RPAS type to be operated;
  - (8) The RPAS Technical Log system, for each RPAS type to be operated;
  - (9) Where appropriate, the technical specification(s) of the formal agreement with a contracted maintenance organization;
  - (10) Where appropriate, the technical specification(s) of the formal agreement with any sub-contracted organization;
  - (11) A copy of the self-evaluation report;
  - (12) A MAR-OPS 4 compliance checklist for each individual RPAS to be operated;
  - (13) A copy of Certificate(s) of Registration (if available), for the RPAS to be operated;
  - (14) A copy of Certificate(s) of Airworthiness (if available), for the RPAS to be operated;
  - (15) A copy of the Noise Certificate(s), for the RPAS to be operated if applicable; and
  - (16) A copy of the radio station licence(s), for the RPAS to be operated if applicable.
- (c) The application for an initial issue of a MAOC or any variation on an issued MAOC shall be made on a form and in a manner established by the MAA-NLD.
- (d) The application for an initial issue of a MAOC must be submitted at least 90 days before the intended certification date.
- (e) The application for the variation on an issued MAOC must be submitted at least 30 days, or as otherwise agreed to by the MAA-NLD, before the date of intended approval.
- (f) The application for the renewal of an issued MAOC must be submitted at least 30 days, or as otherwise agreed to by the MAA-NLD, before the end of the existing period of validity.

- (g) Other than in exceptional circumstances, the MAA-NLD must be given at least 10 days prior notice of a proposed change to the nominated functions or names of the accountable manager, post holder and or quality manager, as meant in MAR-OPS 4.185 (a) (5), (6) and (7).

### ***MAR-OPS 4.190 Issue, variation and continued validity of a Special Approval***

- (a) The Operator will not be granted a Special Approval, a variation on an issued Special Approval, or that Special Approval will not remain valid unless he has demonstrated to the MAA-NLD that:
- (1) The applicable MAR-OPS 4 subpart T requirement(s) are complied with;
  - (2) The RPAS and required equipment comply with the applicable airworthiness requirements and approvals;
  - (3) A training program has been established for all operations personnel involved in these operations; and
  - (4) Operating procedures in accordance with the applicable requirement(s) have been specified in the Operations Manual.
- (b) The MAA-NLD may require to witness one or more actual flights, operated as applied for.
- (c) The Operator shall notify the MAA-NLD of any change to the items listed in sub-paragraph (a) above before such change takes place.
- (d) Special Approvals remain valid subject to the Operator remaining in compliance with this sub-paragraph (a) above and MAR-OPS 4.175(d).
- (e) A Special Approval will be varied, suspended or revoked if the MAA-NLD is no longer satisfied that the Operator can execute operations under the terms of the Special Approval safely.
- (f) The scope of activity that the Operator is approved to conduct under the terms of the issued Special Approval shall be specified on and added to the MAOC by the MAA-NLD.

### ***MAR-OPS 4.194 Application for a Special Approval or a variation on an issued Special Approval***

- (a) The Operator shall ensure that the following information is included in the initial application for a Special Approval and, when applicable, any variation applied for:
- (1) The official name, contact information and business location(s) of the applicant;
  - (2) A description of the proposed operation; and
  - (3) The Operations Manual, or relevant (amended) parts thereof, and all other documentation relevant to the Special Approval applied for.

- (b) An application for a Special Approval or any variation on an issued Special Approval shall be made using a form and in manner established by the MAA-NLD (see *MAA-NLD intranet website*).
- (c) The application for an initial issue of a Special Approval must be submitted at least 90 days before the intended certification date, except that the Operations Manual may be submitted later but not less than 60 days before the intended certification date.
- (d) The application for the variation on an issued Special Approval must be submitted at least 30 days, or as otherwise agreed to by the MAA-NLD, before the date of intended approval.

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### ***MAR-OPS 4.195 Operator's responsibility***

- (a) The Operator is, in the interest of safety, responsible for the operation of any RPAS operated under the terms and conditions of his MAOC.
- (b) The Operator shall establish and maintain a method for exercising the responsibility in sub-paragraph (a) above. This method is to be included in the Operations Manual.

### ***MAR-OPS 4.200 Operations Manual***

The Operator shall provide an Operations Manual in accordance with MAR-OPS 4 subpart P for the use and guidance of operations personnel.

### ***MAR-OPS 4.205 Competence of operations personnel***

The Operator shall ensure that personnel assigned to, or directly involved in, ground and flight operations, crew training and maintenance management, are properly instructed, have demonstrated their abilities in their particular duties and are aware of their responsibilities and the relationship of such duties to the operation as a whole.

### ***MAR-OPS 4.210 Establishment of procedures***

The Operator shall:

- (a) Establish procedures and instructions containing managerial, supervisors', ground staff and crew members' responsibilities and duties for all types of operation on the ground and during flight;
- (b) Establish a checklist system to be used by crew members for all phases of operation of the RPAS under normal, abnormal and emergency conditions as applicable, to ensure that the relevant operating procedures in the Operations Manual and the SFM are followed. The design, contents and utilisation of checklists shall observe human factors and crew resource management principles;
- (c) Make arrangements for the production of manuals, amendments and other documentation; and
- (d) Ensure that no crew member performs any activity during take-off or launch, initial climb, final approach and landing or recovery except those duties required for mission execution and the safe operation of the RPAS.

### ***MAR-OPS 4.215 Use of Air Traffic Services and Tactical Control Services***

The Operator shall ensure that Air Traffic Services and /or Tactical Control Services are used for all flights requiring such services.

### ***MAR-OPS 4.220 Authorization of operating sites***

The Operator shall only authorize use of operating sites (and or alternate operating sites if applicable) that are adequate for the type(s) of RPAS and operation(s) concerned, by

ensuring that all available documentation and information (included meteorological information) is used to establish the adequacy of the operating sites for use, to ensure safe operations.

### **MAR-OPS 4.225 Aerodrome/Site operating minima**

- (a) The Operator shall establish aerodrome or launch and recovery site operating minima for each departure, destination or alternate aerodrome/site planned to be used in accordance with 4.220. These minima shall not be lower than those established for such aerodromes/site by the State in which the aerodrome/site is located, except when specifically approved by that State. Any increment specified by the competent authority shall be added to the minima.
- (b) When establishing these operating minima, the operator shall take the following into account (if applicable):
  - (1) The type, performance and handling characteristics of the RPA;
  - (2) The composition, competence and experience of the flight crew;
  - (3) The dimensions and characteristics of the runways/final approach and take-off areas that may be selected for use;
  - (4) The adequacy and performance of the available visual and non-visual ground aids;
  - (5) The equipment available on the RPAS for the purpose of navigation and/or control of the flight path during the take-off, the approach, the flare, the landing, rollout and the missed approach;
  - (6) For the determination of obstacle clearance, the obstacles in the approach, missed approach and the climb-out areas necessary for the execution of contingency procedures;
  - (7) The obstacle clearance altitude/height for the instrument approach procedures;
  - (8) The means to determine and report meteorological conditions; and
  - (9) The flight technique to be used during the final approach.
- (c) The operator shall specify the method of determining the operating minima in the operations manual.
- (d) (if applicable) The minima for a specific type of approach and landing procedure are considered applicable if:
  - (1) The ground equipment shown on the respective chart required for the intended procedure is operative;
  - (2) The RPAS systems required for the type of approach are operative;
  - (3) The required RPAS performance criteria are met; and
  - (4) The crew is qualified accordingly.

### **MAR-OPS 4.230 Departure and approach procedures**

- (a) The Operator shall ensure that departure and approach procedures established by the state in which the operating site is located are used.
- (b) If the Operator deems compliance with sub-paragraph (a) above impracticable due to the nature of the operation, different procedures to those required in sub-paragraph (a) above may be implemented by the Operator provided they have been coordinated with the State in which the operating site is located.
- (c) Notwithstanding sub-paragraph (a) above, the RPAS cdr may, if applicable, accept an Air Traffic Control (ATC) clearance to deviate from a published departure or arrival route, provided obstacle clearance criteria are observed and full account is taken of the operating conditions. The final approach must be flown in accordance with the established approach procedure.

### **MAR-OPS 4.240 Routes and areas of operation**

- (a) The Operator shall ensure that operations are only conducted along routes, or within areas, for which:
  - (1) Air navigation facilities and services, including meteorological services, are provided which are adequate for the planned operation;
  - (2) The performance of the RPA is adequate to comply with minimum flight altitude requirements;
  - (3) The equipment of the RPA meets the minimum requirements for the planned operation; and
  - (4) Appropriate maps and charts are available.
- (b) The Operator shall ensure termination points are established when the RPAS Cdr determines that a landing at a suitable operating site cannot be made safely without undue risk to personnel or property, or no suitable emergency airfield is available or within RPA range.

### **MAR-OPS 4.241 Operations in airspace with Reduced Vertical Separation Minima**

The Operator shall not operate a RPAS in designated airspace with Reduced Vertical Separation Minima (RSVM) under the terms and conditions applicable to that airspace, unless holding a Special Approval issued by the MAA-NLD for this type of operation (reference MAR-OPS 4.1335).

### **MAR-OPS 4.243 Operations in areas with specified navigation performance**

The Operator shall not operate a RPAS in designated airspace with specified navigation performance, under the terms and conditions applicable to that airspace, unless holding a Special Approval issued by the MAA-NLD for this type of operation (reference MAR-OPS 4.1330).

### **MAR-OPS 4.248 Establishment of minimum flight altitudes**

- (a) The Operator shall establish a method in the Operations Manual to determine minimum flight altitudes, which provide the required obstacle clearance.
- (b) Where minimum flight altitudes established by States are higher than those established by the Operator, the higher values shall apply.

### **MAR-OPS 4.255 Fuel/Electrical power policy**

- (a) The Operator shall establish a fuel/ electrical power policy for the purpose of flight planning and in-flight replanning to ensure that every flight carries sufficient fuel/ electrical power for the planned operation and reserves to cover deviations from the planned operation.
- (b) The Operator shall ensure that the planning of flights is based upon at least:
  - (1) Procedures contained in the Operations Manual:
    - (i) Data provided by the RPA manufacturer; or
    - (ii) Current RPA-specific data derived from a fuel/ electrical power consumption monitoring system.
  - and:
  - (2) The operating conditions under which the flight is to be conducted including:
    - (i) RPA fuel/ electrical power consumption data; and
    - (ii) Anticipated masses.

## **MAR-OPS 4.290 Flight preparation**

- (a) The Operator shall ensure that all mission essential information documentation relevant to the type of operation (reference MAR-OPS 4.1060) is completed for each intended flight and the contents is briefed to all crew members before the commencement of flight, if applicable, even if MAR-OPS 4.135(a) does not require mission essential information documentation to be present during flight.
- (b) The RPAS Cdr shall not commence a flight unless he is satisfied that:
- (1) The RPAS is airworthy;
  - (2) The RPAS is not operated contrary to the provisions of the CDL, if available for the applicable RPAS type;
  - (3) The instruments and equipment required for the flight to be conducted, in accordance with MAR-OPS 4 subparts K and L, are in operable condition except as provided in the Operator's MEL, if available;
  - (4) The documents, checklists, additional information and documentation required to be available by MAR-OPS 4.125, MAR-OPS 4.130 and MAR-OPS 4.135 are available;
  - (5) Current maps, charts and associated documentation or equivalent data are available to cover the intended operation of the RPA including any diversion which may reasonably be expected. This shall include any conversion tables necessary to support operations where metric heights, altitudes and flight levels must be used;
  - (6) Air navigation facilities and Air Traffic and Tactical Control services required for the planned flight are available and adequate (reference MAR-OPS 4.215);
  - (7) An Air Traffic Service (ATS) flight plan has been submitted (if applicable) in accordance with the Operations Manual (reference MAR-OPS 4.300);
  - (8) Flight planning shows that the operation can be conducted in accordance with the Operations Manual;
  - (9) Only one crewmember changes out at a time to ensure continuous monitoring of the RPA (if applicable);
  - (10) The incoming crew is briefed on the mission and RPAS status (if applicable);
  - (11) The RPAS configuration is certified (if applicable);
  - (12) The mass of the RPAS, at the commencement of take-off roll or launch, will be such that the flight can be conducted in compliance with MAR-OPS 4 subpart G;
  - (13) Any operational limitation in addition to those covered by sub-paragraphs (10) and (12) above can be complied with; and
  - (14) The operations can be conducted in compliance with relevant national and international rules and regulations.

### **MAR-OPS 4.295 Selection of destination and alternate aerodromes**

- (a) The Operator shall establish procedures in the Operations Manual for the selection of destination and or alternate operating sites in accordance with MAR-OPS 4.220 when planning a flight.

### **MAR-OPS 4.300 Submission of ATS flight plan**

- (a) The Operator shall ensure that:
  - (1) Flight is not commenced unless an ATS flight plan has been submitted, or adequate information has been deposited, or transmitted as soon as possible after take-off, in order to permit alerting services to be activated if required; and
  - (2) Instructions are included in the Operations Manual for completing and submitting an ATS flight plan, at least addressing a method for determination and filing of the required and or applicable 'type of flight' and 'flight rules' flight plan items.

### **MAR-OPS 4.303 Ground procedures – Pre-, thru- and post-flight inspections**

- (a) The Operator shall not operate a RPAS unless the pre-, thru- or post-flight inspection or equivalent has been completed.
- (b) The Operator shall establish procedures in the Operations Manual for the conduct of pre-, thru- or post-flight inspections including the duties and responsibilities of the required personnel.
- (c) Pre-, thru- and post-flight inspections shall be conducted by suitably qualified personnel.

### **MAR-OPS 4.304 Ground procedures – Loading/reloading/unloading**

- (a) The Operator shall establish procedures in the Operations Manual for the loading, reloading and unloading of weapons, munitions, expendables and external stores with and without engine(s) running. These procedures shall at least specify:
  - (1) Type and number of equipment required;
  - (2) Type and number of personnel required;
  - (3) Duties and responsibilities of the required personnel;
  - (4) Communication procedures between flight crew and involved ground staff, if applicable;
  - (5) Safe areas and safe distances;
  - (6) Limiting conditions and or restrictions;
  - (7) Contingency procedures; and

(8) Emergency procedures.

(b) The loading, reloading and unloading of weapons, munitions, expendables and external stores shall be conducted by suitably qualified personnel.

### **MAR-OPS 4.305 Ground procedures – Refuelling/defuelling**

(a) The Operator shall establish procedures in the Operations Manual for refuelling and defueling RPA on the ground.

(b) Refuelling and defueling shall be conducted by suitable qualified personnel.

### **MAR-OPS 4.307 Ground procedures – Arming/dearming**

(a) The Operator shall establish procedures in the Operations Manual for arming and dearming of RPAS armament. These procedures shall at least specify:

(1) Duties and responsibilities of the required personnel;

(2) Communication procedures between flight crew and ground staff, if applicable;

(3) Safe directions;

(4) Limiting conditions and or restrictions;

(5) Contingency procedures; and

(6) Emergency procedures.

(b) The arming and dearming of RPAS armament shall be conducted by suitably qualified personnel.

### **MAR-OPS 4.308 Ground procedures – Other**

The Operator shall establish procedures in the Operations Manual for:

(b) Aided and unaided RPA movements on the ground;

(c) Preparation for launch of RPA not using a runway ;

(d) Recovery of RPA not using a runway;

(e) Handling of emergency or abnormal situations RPA; and

(f) Emergency evacuation of the RPS during RPAS operations.

### **MAR-OPS 4.321 Carriage of weapons, munitions, expendables and external payloads**

- (a) The Operator shall not carry any weapons, munitions, expendables and external stores as an integral part of the RPAS, unless these weapons, munitions, expendables and external stores are certified as an authorized configuration by the MAA-NLD.
- (b) For the purpose of employment of any weapons and expendables during flight, the Operator shall ensure that these weapons and expendables are:
  - (1) Loaded or attached to the RPAS in accordance with the Operator's procedures, preventing inadvertent release or firing of weapons or release of (weapon) stores (reference MAR-OPS 4.304);
  - (2) Armed and de-armed in accordance with the Operator's procedure (reference MAR-OPS 4.307); and
  - (3) Operated in accordance with the Operator's procedures, preventing unintentional release or firing and unintended risk to third parties.
- (c) The Operator shall establish a procedure for simulating weapon and or munition employment, while carrying live and or training weapons or munition.

### **MAR-OPS 4.322 In-flight dispensing**

The Operator shall:

- (a) Establish procedures to ensure that during in-flight dispensing of expendables or external stores and employment of weapons or munitions:
  - (1) There is no unintentional hazard to third parties; and
  - (2) The risk to the airframe is minimised.
- (b) Ensure that no external stores or expendables will be dispensed, or weapons and munitions employed from the RPAS without the permission of the RPAS Cdr;
- (c) Establish contingency procedures, covering at least the handling of:
  - (1) Unsafe weapons and or munitions;
  - (2) RPAS armament or dispensing system malfunction; and
  - (3) Battle damage.
- (d) Ensure that in-flight dispensing of expendables or external stores and the employment of weapons or munitions is in compliance with relevant national regulations.
- (e) Ensure that equipment is certified for in-flight dispensing of expendables or external stores and the employment of weapons or munitions.

### **MAR-OPS 4.323 Use of electro-magnetic systems**

The Operator shall:

- (a) Establish procedures in the Operations Manual to ensure that during the activation of electro-magnetic systems:
  - (1) There is no unintentional hazard to third parties.
- (b) Ensure that no electro-magnetic system is activated without the permission of the RPAS Cdr;
- (c) Specify with respect to the activation of electro-magnetic systems, safe areas and safe distances, where applicable;
- (d) Establish contingency procedures covering at least the handling of electro-magnetic system malfunctions; and
- (e) Ensure that the usage of electro-magnetic systems is in compliance with relevant national regulations.

### **MAR-OPS 4.327 Safety rules**

- (a) With respect to a safe mission execution, the Operator shall establish in the Operations Manual a coherent set of safety rules and procedures for all phases of flight, minimizing the risk of or hazard to:
  - (1) Third parties, both on the ground and in the air;
  - (2) Own RPAS;
  - (3) Mid-air or ground collision; and
  - (4) Departing controlled flight.
- (b) The Operator shall ensure that mission execution is in compliance with safety rules as meant by sub-paragraph (a) above, the relevant national safety rules and procedures or relevant safety rules and procedures established by a third party, whichever is more restrictive.

### **MAR-OPS 4.340 Meteorological conditions – destination and destination alternate**

- (a) The RPAS Cdr shall not:
  - (1) Commence take-off; nor
  - (2) Continue beyond the point from which a revised flight plan applies in the event of in-flight replanning, unless information is available indicating that the expected weather conditions at the destination and required alternate aerodrome(s), prescribed in MAR-OPS 4.295, are at or above the planning minima, prescribed in MAR-OPS 4.295.

- (b) The RPAS Cdr shall not continue towards the planned destination aerodrome unless the latest information available indicates that, at the expected time of arrival, the weather conditions at the destination, or the destination alternate aerodrome, are at or above the applicable aerodrome operating minima.
- (c) Sub-paragraphs (a) and (b) above are not applicable for RPA's that use a launch and recovery system. For these systems the Operator shall establish a procedure in the Operations Manual to determine how the flight shall be terminated with regard to weather, services and availability of the sites.

#### ***MAR-OPS 4.342 Meteorological conditions – enroute***

Meteorological conditions shall be suitable for RPA operations.

#### ***MAR-OPS 4.345 Ice and other contaminants – ground procedures***

- (a) The Operator shall establish procedures in the Operations Manual for ground de-icing and anti-icing and related inspections of the RPAS.
- (b) The RPAS Cdr shall not commence take-off unless the external surfaces are clear of any deposit which might adversely affect the performance and or controllability of the RPAS except as permitted in the SFM.
- (c) The Operator shall establish a procedure to reduce the risk of unobserved intake icing.

#### ***MAR-OPS 4.346 Icing conditions– flight procedures***

The RPAS Cdr shall not commence a flight nor intentionally fly into expected or actual icing conditions unless the RPA is certificated and equipped to cope with such conditions.

#### ***MAR-OPS 4.348 Adverse operating conditions – ground and flight procedures***

The Operator shall establish procedures and operating limits in the Operations Manual for operating in or in the vicinity of adverse weather and or environmental conditions, covering at least:

- (a) Hot and cold weather conditions;
- (b) Dust or sand in atmosphere;
- (c) Volcanic ash in atmosphere;
- (d) Rough sea conditions;
- (e) Strong wind and windshear conditions;
- (f) Severe turbulence; and
- (g) Thunderstorms or lightning.

### **MAR-OPS 4.350 Mission and RPAS acceptance**

The Operator shall establish procedures in the Operations Manual for the RPAS Cdr to:

- (a) Accept the mission; and
- (b) Accept the RPAS after having verified that the status of the RPAS is in compliance with flight planning as stated in MAR-OPS 4.290 and the pre-, thru- or postflight inspection is completed in accordance with Operator's procedures (reference MAR-OPS 4.303).

### **MAR-OPS 4.352 Engine Start and taxi procedures**

- (a) The Operator shall establish procedures in the Operations Manual to ensure a safe engine start and taxi-out. These procedures shall as a minimum take full account of:
  - (1) Communication procedures between flight crew and groundcrew and failure thereof;
  - (2) Taxiway dimensions and conditions; and
  - (3) Other ground movement.

### **MAR-OPS 4.355 Take-off/Launch and departure conditions**

- (a) The Operator shall establish procedures in the Operations Manual to ensure a safe take-off or launch and departure. These procedures shall as a minimum take full account of:
  - (1) RPA configuration(s);
  - (2) Take-off performance (reference MAR-OPS 4 subpart G);
  - (3) Airfield/operating site status;
  - (4) Weather and runway conditions (if applicable); and
  - (5) Wake turbulence separation criteria (if applicable).
- (b) Before commencing take-off, the RPAS Cdr must satisfy himself that, according to the information available to him the weather at the operating site is adequate to conduct a safe take-off and departure.

### **MAR-OPS 4.365 Minimum flight altitudes**

The RPAS Cdr shall not fly below specified minimum flight altitudes except when necessary for take-off or landing or if required due to the nature of the operation.

### **MAR-OPS 4.375 In-flight fuel/ electrical power management**

- (a) The Operator shall establish a procedure in the Operations Manual to ensure fuel/ electrical power management is carried out.
- (b) The RPAS Cdr shall ensure that the amount of usable fuel/ electrical power is not less than the fuel/ electrical power required to proceed to an aerodrome where a safe landing can be made with final reserve fuel/ electrical power remaining.

### **MAR-OPS 4.395 Ground proximity detection**

When undue proximity to the ground is detected by a ground collision avoidance advisory system (if equipped), the RPAS Cdr shall ensure that corrective action is initiated immediately to establish safe flight conditions.

### **MAR-OPS 4.396 Use of RPAS lighting**

The Operator shall establish a procedure in the Operations Manual for the use of RPAS lighting taking into account:

- (a) National regulations;
- (b) The nature of the operation;
- (c) The risk of in-flight collision; and
- (d) The provisions and requirements stated in the '*Regeling doven luchtvaartuiglichten militaire luchtvaartuigen*'.

### **MAR-OPS 4.398 Use of Airborne Collision Avoidance System (ACAS)**

The Operator shall establish procedures to ensure that:

- (a) When ACAS is installed and serviceable, it shall be used in flight in a mode that enables Resolution Advisories (RA) to be produced unless to do so would not be appropriate for conditions existing at the time; and
- (b) When undue proximity to another aircraft (RA) is detected by ACAS, the RPIL shall ensure that corrective action is initiated immediately to establish safe separation.

### **MAR-OPS 4.399 Transfer of RPA control**

The Operator shall establish procedures in de Operations Manual to ensure a safe transfer of control of the RPA between the Launch and Recovery Element (LRE) and the Mission Control Element (MCE) and vice-versa.

### **MAR-OPS 4.400 Approach and landing conditions**

- (a) The Operator shall establish procedures in the Operations Manual to ensure a safe approach and landing. These procedures shall as a minimum take full account of:

- (1) RPAS configuration(s);
  - (2) Landing performance (reference MAR-OPS 4 subpart G);
  - (3) Airfield status;
  - (4) Weather and runway conditions; and
  - (5) Wake turbulence separation criteria.
- (b) Before commencing an approach to land, the RPAS Cdr must satisfy himself that, according to the information available to him, the weather at the aerodrome and the condition of the runway intended to be used do not prevent a safe approach, landing or missed approach, having regard to the performance information contained in the Operations Manual.
- (c) Sub-paragraphs (a) and (b) above are not applicable for RPA's that use a launch and recovery system. For these systems the Operator shall establish a procedure in the Operations Manual to determine how the flight shall be terminated with regard to weather, services and availability of the sites.

#### ***MAR-OPS 4.405 Loss of datalink***

- (a) The Operator shall establish procedures in the Operations Manual to ensure a safe recovery of the RPA in case the datalink between the RPS and the RPA is unreliable or lost.
- (b) The lost-link procedures shall cover at least:
- (1) The route, altitude and duration the RPA will maintain;
  - (2) Procedures to inform ATC of the RPA's programmed flight;
  - (3) Procedures to re-establish the datalink; and
  - (4) Procedures of flight termination in case datalink is not re-established.

#### ***MAR-OPS 4.415 Flight registration book and RPAS Technical Log***

The RPAS Cdr shall after each flight complete and (digitally) sign the flight registration book and the relevant parts of the RPAS Technical Log.

#### ***MAR-OPS 4.420 Occurrence reporting***

The Operator shall comply with SMAR-1 (Special Military Aviation Requirements dealing with Occurrence Reporting).

#### ***MAR-OPS 4.447 Demonstration flights.***

- (a) The Operator shall ensure that demonstration flights are:
- (1) In compliance with relevant national regulations;

- (2) In compliance with STANAG 3533 or an equivalent standard acceptable to the MAA-NLD; and
  - (3) Performed by personnel that is suitably qualified and authorised by the Operator to do so.
- (b) The Operator shall develop and approve special flight profiles, if applicable, which are in accordance with standard acceptable to the MAA-NLD; and
- (c) The Operator shall specify in the operations manual the conditions for the safe conduct of demonstration flights, to include:
- (1) Minimum safety margins and distances to minimize any hazards to third parties in the air and or on the ground;
  - (2) Mandatory procedures with respect to:
    - (i) Flight planning, to include contingency planning;
    - (ii) Required pre-flight briefing; and
    - (iii) Mission execution.
  - (3) Minimum equipment and or RPAS requirements;
  - (4) CRM aspects for all personnel involved; and
  - (5) Limitations and or restrictions.

### ***MAR-OPS 4.455 Operational Testing***

- (a) Before conducting operations beyond the scope of his MAOC or introducing new or modified RPAS hardware and or software, (role) equipment, or weapons, the Operator shall conduct operational testing and evaluation, to determine:
- (1) Required changes to flight crew training, maintenance management procedures and operational concepts and procedures as described in the Operations Manual; and
  - (2) Required differences training for flight crew (reference MAR-OPS 4.950) and or other relevant operations personnel.
- (b) For the conduct of operational testing and evaluation, the Operator shall:
- (1) Comply with this MAR-OPS 4 and the procedures as laid down in the Operations Manual, unless described otherwise in the operational test plan; and
  - (2) Comply with the operational test plan as required by sub-paragraph (c) below.
- (c) The Operator shall specify in an operational test plan, acceptable to the MAA-NLD, the conditions for the safe conduct of operational testing and evaluation.

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## SUBPART G – Performance

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### **MAR-OPS 4.485 General**

- (a) The Operator shall ensure that the mass of the RPA does not exceed the maximum gross weight as defined in the Flight Manual.
- (b) For compliance with the requirements of this subpart:
  - (1) Due account shall be taken of RPA configuration, environmental conditions and the operation of systems which have an adverse effect on performance;
  - (2) Approved performance data in the Flight Manual may be supplemented as necessary with other data acceptable to the MAA-NLD if the approved performance data in the Flight Manual is insufficient in respect of items such as accounting for reasonably expected adverse operating conditions such as take-off and landing on wet and contaminated runways; and
  - (3) A damp runway may be considered to be dry.

### **MAR-OPS 4.490 Take-off**

- (a) The Operator shall establish in the Operations Manual a procedure to calculate take-off performance data allowing for a safe take-off within the take-off distance available or abort within the accelerate-stop distance available.
- (b) The Operator shall ensure RPA are operated within the take-off data calculated in accordance with (a) above.
- (c) A RPA that does not take-off from a runway, shall in the event of a critical power unit failure during the launch sequence, be able:
  - (1) To immediately abort the operation within the launch safety area; or
  - (2) To safely recover if beyond the launch safety area.

### **MAR-OPS 4.500 Enroute – engine failure**

- (a) The Operator shall establish procedures with respect to engine failure including Visual Meteorologic Conditions (VMC), IMC, night and training conditions.
- (b) Except when necessary for take-off or landing at an approved operating site, a RPA shall only be operated over the congested areas of cities, towns or settlements or over an open-air assembly of persons, when it is able to make a landing without undue hazard to third parties, in the event of a power-unit failure.

## **MAR-OPS 4.510 Landing – Destination and alternate aerodromes**

- (a) The Operator shall establish a procedure in the Operations Manual to calculate landing performance data allowing for a safe landing within the landing distance available.
- (b) The Operator shall ensure RPA are operated within the landing data calculated in accordance with (a) above.
- (c) Sub-paragraphs (a) and (b) above are not applicable for RPA's that use a launch and recovery system. For these systems the Operator shall establish a procedure in the Operations Manual to determine how the flight shall be terminated with regard to weather, services and availability of the sites.

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## SUBPART J – Mass and Balance

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### **MAR–OPS 4.605 General**

- (a) The Operator shall ensure that during any phase of operation, the loading, mass and centre of gravity of the RPA complies with the limitations specified in the approved Flight Manual, or the Operations Manual if more restrictive.
- (b) The Operator shall establish the mass and the centre of gravity of any RPA by actual weighing prior to initial entry into service and thereafter at intervals of 4 years or at intervals in accordance with the maintenance program, whichever is more restrictive. The accumulated effects of modifications and repairs on the mass and balance must be accounted for and properly documented. Furthermore, RPA must be reweighed if the effect of modifications on the mass and balance is not accurately known.
- (c) The Operator shall determine the mass of all operating items included in the aircraft dry operating mass by weighing or by using standard masses. The influence of their position on the aircraft centre of gravity must be determined.
- (d) The Operator shall determine the mass of the fuel load by using the actual density or, if not known, the density calculated in accordance with a method specified in the Operations Manual.

### **MAR–OPS 4.610 Configuration management, mass and balance**

The Operator shall specify, in the Operations Manual, the principles and methods involved in the configuration management and mass and balance system that meet the requirements of MAR–OPS 4.605. This system must cover all types of intended operations.

### **MAR–OPS 4.625 Mass and balance documentation**

- (a) The Operator shall establish mass and balance documentation prior to each flight specifying the mass and balance specification of the applicable RPA configuration. The mass and balance documentation must enable the RPAS Cdr to determine that the RPA configuration is such that the mass and balance limits of the RPA are not exceeded. The person supervising the loading of the RPA must confirm by signature that the RPA configuration is in accordance with the mass and balance documentation. This document must be acceptable to the RPAS Cdr, his/her acceptance being indicated by signing for RPA acceptance.
- (b) The Operator shall specify procedures for last minute changes to the aircraft configuration.

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## SUBPART K – Instruments and equipment

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### **MAR-OPS 4.630 General introduction**

- (a) The Operator shall ensure that a flight does not commence unless the RPAS's instruments and equipment are in accordance with the applicable national requirements for RPAS of the airspace concerned.
- (b) The Operator shall ensure that a flight does not commence unless the instruments and equipment required under this subpart are:
  - (1) Approved and installed in accordance with the requirements applicable to them, including the minimum performance standard and the military operational and airworthiness requirements; and
  - (2) In operable condition except as provided in the MEL.
- (c) Instruments and equipment minimum performance standards are those prescribed in the applicable EASA Technical Standard Orders (ETSO) as listed in CS-TSO or equivalent requirements acceptable to the MAA-NLD, unless different performance standards are prescribed in the military operational or airworthiness codes. Instruments and equipment complying with design and performance specifications other than ETSO on the date that MAR-OPS 4 enters into force may remain in service, or be installed, unless additional requirements are prescribed in this subpart. Instruments and equipment that have already been approved do not need to comply with a revised ETSO or a revised specification, other than ETSO, unless a retroactive requirement is prescribed.

### **MAR-OPS 4.640 RPAS operating lights**

- (a) The Operator shall not operate a RPAS in non-segregated airspace unless it is equipped with:
  - (1) For flights by day:
    - (i) An anti-collision light system.
  - (2) For flights under IMC or by night, in addition to equipment specified in paragraph (a) above:
    - (i) Navigation and position lights; and

(ii) A landing light.

(3) Unless local regulation allow reduced lighting.

### ***MAR-OPS 4.650 Flight and navigational instruments and associated equipment***

(a) The Operator shall not operate a RPAS unless it is equipped with the flight and navigational instruments and associated equipment and, where applicable, under the conditions stated in the following sub-paragraphs able of measuring and displaying:

(1) (magnetic) Heading;

(2) Accurate time, in hours, minutes and seconds;

(3) (pressure) Altitude in feet;

(4) (indicated) Air speed in knots; and

(5) Attitude.

(b) Instruments and equipment shall be readily operable or accessible from the station where the flight crew member that needs to use it is located.

(c) Instruments and equipment used by flight crew members shall be arranged so as to enable them to see the indications for use readily from their station, with the minimum practicable deviation from the position and line of vision which they normally assume.

(d) A RPS must be equipped with means for indicating when power is not adequately supplied to the required flight instruments.

(e) Each airspeed indicating system must provide reliable airspeed indication under all applicable atmospheric conditions.

### ***MAR-OPS 4.660 Altitude Alerting system***

The Operator shall not operate a RPAS unless equipped with an altitude alerting system capable of:

(1) Alerting the RPil upon approaching a pre-selected altitude; and

(2) Alerting the RPil by at least an aural signal, when deviating from a preselected altitude.

### ***MAR-OPS 4.665 Ground proximity warning system and terrain awareness warning system***

The Operator shall not operate a RPAS unless it is equipped with at least an audible ground collision avoidance advisory system.

### ***MAR-OPS 4.675 Equipment for operations in icing conditions***

The Operator shall not operate a RPAS in expected or actual icing conditions unless it is certificated and equipped to operate in icing conditions.

### ***MAR-OPS 4.685 Crew communication system***

The Operator shall not operate a RPAS with more than one crew member unless it is equipped with a communication system.

### ***MAR-OPS 4.727 Recording equipment***

The Operator shall not operate a RPAS unless it is equipped with recording equipment to continuously record, with a reference to a time scale, voice communications and relevant flight data in support of accident and incident data requirements (reference MAR-OPS 4.160) and the Operator's Safety Management System (reference MAR-OPS 4.037).

### ***MAR-OPS 4.820 Emergency locator transmitter***

- (a) The Operator shall not operate an aircraft unless it is equipped with an automatic emergency locator transmitter
- (b) Whenever it is possible to disable the automatic activation functionality of an automatic emergency locator transmitter as mentioned in sub-paragraph (a) above, the Operator shall establish an operational procedure for enabling and disabling the automatic activation function

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## SUBPART L – Communication and navigation equipment

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### **MAR-OPS 4.845 General introduction**

- (a) The Operator shall ensure that a flight does not commence unless the RPAS's communication and navigation equipment are in accordance with the applicable national requirements for military RPAS of the airspace concerned.
- (b) The Operator shall ensure that a flight does not commence unless the communication and navigation equipment required under this Subpart is:
  - (1) Approved and installed in accordance with the requirements applicable to them, including the minimum performance standard and the operational and military airworthiness requirements;
  - (2) Installed such that the failure of any single unit required for either communication or navigation purposes, or both, will not result in the failure of another unit required for communications or navigation purposes; and
  - (3) In operable condition except as provided in the MEL if available.
- (c) Communication and navigation equipment minimum performance standards are those prescribed in the applicable (STANAG 4671) airworthiness requirements for military RPAS, or equivalent requirements acceptable to the MAA-NLD. Communication and navigation equipment complying with design and performance specifications other than the applicable STANAG (4671) on the date of MAR-OPS implementation may remain in service, or be installed, unless additional requirements are prescribed in this Subpart. Communication and navigation equipment which has already been approved does not need to comply with a revised specification, other than the applicable STANAG (4671), unless a retroactive requirement is prescribed.

### **MAR-OPS 4.865 Communication and navigation equipment**

- (a) The Operator shall not operate a RPAS as a controlled flight unless it is equipped with communication equipment in accordance with the applicable requirements of air traffic services in the area(s) of operation (see also MAR-OPS 4.845 (a)).
- (b) The Operator shall ensure that under normal operating conditions and in the event of any contingency the communication with an appropriate control station is guaranteed.
- (c) The Operator shall ensure that the RPAS is:
  - (1) Equipped with navigation equipment appropriate for the route to be flown (including departure, arrival and approach) and the area of operation;
  - (2) Sufficiently equipped to ensure that – in the event of the failure of one item of equipment – in any stage of the flight, the remaining equipment will enable the RPAS to navigate safely; and

- (3) Equipped with navigation equipment that meets the navigation performance as mentioned by sub-paragraph (c)(1) above in terms of navigation functionality, accuracy, integrity, availability and continuity.
- (d) The Operator shall ensure that (VHF) communication and navigation equipment are of a type that has been approved as complying with the FM immunity performance standards.

### ***MAR-OPS 4.866 Transponder equipment***

The Operator shall not operate a RPAS in non-segregated airspace unless it is equipped with a Secondary Surveillance Radar (SSR) Mode S Elementary Surveillance (ELS) transponder which operates in accordance with ICAO Annex 10, Volume IV.

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## SUBPART M – Maintenance management

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### **MAR-OPS 4.875 General**

- (a) The Operator shall ensure that all RPAS operated under his MAOC hold an applicable and valid Certificate of Airworthiness issued by the MAA-NLD or a recognised Authority and are maintained and released to service by an organization appropriately approved in accordance with MAR-145 or equivalent acceptable to the MAA-NLD.
- (b) Based on the scope of the operation the MAA-NLD can exempt an Operator from the requirement in this Subpart.

### **MAR-OPS 4.887 Continuing airworthiness responsibility**

- (a) The Operator shall ensure the continuing airworthiness of RPAS and the serviceability of equipment as prescribed by MAR-OPS 4 subpart K and L, by:
  - (1) The accomplishment of pre-, thru- and post-flight inspections;
  - (2) The rectification to an approved standard of any defect or damage affecting safe operation, taking into account the approved Operator's MEL (permissible unserviceability's) and the approved Operator's CDL, if available for the applicable RPAS type;
  - (3) The accomplishment of all RPAS maintenance in accordance with the approved Operator's RPAS Maintenance Program(s) (reference MAR-OPS 4.905);
  - (4) The analysis of the effectiveness of the approved Operator's RPAS Maintenance Program(s);
  - (5) The accomplishment of any applicable:
    - (i) Airworthiness Directive;
    - (ii) Operational Directive with a continuing airworthiness impact;
    - (iii) Any other continuing airworthiness requirement established by the MAA-NLD;  
or
    - (iv) Measures mandated by the MAA-NLD in immediate reaction to a safety problem.

- (6) The usage of data approved by the MAA-NLD or by an appropriately approved MAR-21 Military Type Certificate holder or equivalent, as appropriate, for assessing damage and carrying out modifications and repairs;
  - (7) The accomplishment of non-mandatory modifications and inspections;
  - (8) The establishment of an embodiment policy for non-mandatory modifications and inspections; and
  - (9) The accomplishment of maintenance to operational and emergency equipment, as far as not being subject to an approved Operator's RPAS Maintenance Program, in accordance with applicable manufacturer's maintenance manuals and or instructions or equivalent, acceptable to the MAA-NLD.
- (b) The Operator shall ensure that the Certificate of Airworthiness for each RPAS operated, remains valid in respect of:
- (1) The requirements in sub-paragraph (a) above; and
  - (2) Any condition specified in the Certificate of Airworthiness.
- (c) The tasks as mentioned in sub-paragraph (a) (2), (3), (5), (6) and (7) above, shall be conducted by an appropriately approved MAR-145 maintenance organization or equivalent.
- (d) The Operator shall specify procedures in the Operations Manual (Part E - Maintenance management) acceptable to the MAA-NLD satisfying the Operator's continuing airworthiness responsibility as specified in sub-paragraph (a) above.

#### ***MAR-OPS 4.892 Contracting RPAS maintenance***

- (a) The Operator shall make arrangements with an appropriately approved MAR-145 maintenance organization, or equivalent acceptable to the MAA-NLD, to carry out the continuing airworthiness tasks as mentioned in MAR-OPS 4.887 (a)(2), (3), (5), (6) and (7).
- (b) Arrangements between the Operator and a maintenance organization as mentioned in sub-paragraph (a) above to include all amendments, shall be in the form of a verifiable agreement acceptable to the MAA-NLD, at least:
- (1) Detailing the contracted functions specified in MAR-OPS 4.887 (a)(2), (3), (5), (6) and (7);
  - (2) Detailing provisions in support of quality monitoring of contracted maintenance in accordance with appendix 1 to MAR-OPS 4.035 sub-paragraph (a)(3); and
  - (3) Defining the responsibilities of both parties concerning RPAS maintenance data requirements as specified in MAR-OPS 4.910.

#### ***MAR-OPS 4.905 Operator's RPAS Maintenance Program***

- (a) Every RPAS shall be maintained in accordance with the applicable Operator's RPAS Maintenance Program approved by the MAA-NLD.

- (b) The Operator shall ensure that its RPAS Maintenance Program(s) is (are) reviewed at least every year and if necessary is amended accordingly.
- (c) The Operator shall specify procedures in the Operations Manual (Part E – Maintenance management) describing how MAA-NLD approval is obtained regarding the development and changing of the RPAS Maintenance Program(s).
- (d) The Operator’s RPAS Maintenance Program(s) shall establish compliance with:
  - (1) Instructions for continuing airworthiness issued by the applicable (supplementary) type certificate holder; and
  - (2) Instructions issued by the MAA-NLD, if they differ from or in the absence of the instructions mentioned in sub-paragraph (d)(1) above.
- (e) The Operator’s RPAS Maintenance Program(s) shall contain details, including frequency, of all maintenance to be carried out and any specific tasks linked to specific operations.
- (f) The Operator’s RPAS Maintenance Program(s) shall include a reliability program when:
  - (1) The maintenance program is based on maintenance steering group or reliability-centred maintenance methodology;
  - (2) The maintenance program contains components maintained conform a condition monitoring concept; or
  - (3) Not all revision time intervals of any major system components are incorporated.
- (g) In case the Operator has less than 6 RPAS of one type or the MTOW of the RPAS type is less than 5700kg, a reliability program as mentioned in sub-paragraph (f) above is not mandatory.

### **MAR-OPS 4.910 RPAS maintenance data**

The Operator shall ensure that:

- (a) The contracted maintenance organization(s) (reference MAR-OPS 4.892) shall have access to and use only applicable current maintenance data in the performance of RPAS maintenance including modifications and repairs, being:
  - (1) Any applicable requirement, procedure, standard or information issued by the MAA-NLD;
  - (2) Any applicable Airworthiness Directive;
  - (3) Applicable instructions for continuing airworthiness, issued by the applicable (supplementary) type certificate holder; and
  - (4) Any applicable data issued in accordance with MAR-145.A.45(d).
- (b) All applicable maintenance data is current and readily available for use when required by the contracted maintenance organization(s) (reference MAR-OPS 4.892); and

- (c) The contracted maintenance organization(s) (reference MAR-OPS 4.892) establishes a work card or worksheet system to be used and shall either transcribe accurately the maintenance data onto such work cards or worksheets or make precise reference to the particular maintenance task or tasks contained in such maintenance data.

### **MAR-OPS 4.915 RPAS continuing airworthiness record system**

The Operator shall keep for each RPAS type a continuing airworthiness record system and shall ensure that:

- (a) At the completion of any maintenance, the associated Certificate(s) of Release to Service are entered in the RPAS continuing airworthiness records. Each entry shall be made as soon as practicable, but in no event more than 30 days after the day of the maintenance action;
- (b) The RPAS continuing airworthiness records consist of, as appropriate, a RPS logbook, RPA logbook, engine logbook(s) or engine module log cards, propeller logbook(s) and log cards for any service life limited component and the Operator's RPAS Technical Log;
- (c) The RPAS continuing airworthiness records contains for each RPAS component (if applicable):
- (1) The component type and registration mark (if applicable), the date, together with total flight time, flight cycles and or landings, as appropriate;
  - (2) The status of continuing airworthiness related directives, requirements and or measures as mentioned by MAR-OPS 4.887 (a)(5);
  - (3) The status of modifications, repairs and inspections;
  - (4) The status of compliance with the applicable Operator's RPA Maintenance Program;
  - (5) The status of service life limited components;
  - (6) The mass and balance report; and
  - (7) The list of deferred maintenance.
- (d) In addition to the Certificate of Release to Service, Defence Form 1 or equivalent, the following information relevant to any component installed is entered in the appropriate engine logbook, engine module or service life limited component log card:
- (1) Identification of the component;
  - (2) The type, serial number and registration of the RPAS to which the particular component has been fitted, along with the reference to the installation and removal of the component;
  - (3) The particular component accumulated total flight time, flight cycles, landings and or calendar time, as appropriate; and
  - (4) The current information as mentioned in sub-paragraph (c) above, applicable to the component.

- (e) All entries in the RPAS continuing airworthiness records are accurate, made concurrently and permanent in nature. When it is necessary to correct an entry, the correction shall be made in a manner that clearly shows the original entry.

### ***MAR-OPS 4.920 Operator's RPAS Technical Log system***

- (a) The Operator shall keep for each RPAS type a RPAS Technical Log system containing for each RPAS Component (RPA, RPS, Launch and Recovery Systems, etc.) the following information:
- (1) The component type and registration mark (if applicable), for each use the date, name and signature of the RPAS Cdr, together with total operating time, flight cycles and or landings, as appropriate;
  - (2) Information about each flight necessary to ensure continuing flight safety;
  - (3) The current Certificate of Release to Service (if applicable);
  - (4) The current maintenance statement giving the maintenance status of what scheduled and out of phase maintenance is next due except that the MAA-NLD may agree to the maintenance statement being kept elsewhere;
  - (5) A list of all deferred maintenance that affect the operation of the component; and
  - (6) Any necessary guidance instructions on maintenance support arrangements.
- (b) The RPAS Technical Log system and subsequent amendments shall be approved by the MAA-NLD; and
- (c) The MAA-NLD may permit the documentation and information detailed in subparagraph (a) above, or parts thereof, to be presented in a form other than printed paper. A standard of accessibility, usability and reliability, acceptable to the MAA-NLD, must be assured.

### ***MAR-OPS 4.925 Transfer of RPAS continuing airworthiness records***

The Operator shall ensure that when a RPAS is permanently transferred from one Operator to another Operator the records specified in MAR-OPS 4.915 are also transferred.

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## SUBPART N – Flight crew

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### **MAR-OPS 4.935 General**

The Operator shall ensure that all flight crew members hold an applicable and valid licence and military medical certificate issued by the MAA-NLD or a recognised Authority and are suitably qualified and competent to conduct the duties and kind of operations, assigned to them.

### **MAR-OPS 4.943 Initial Operator's crew resource management training**

- (a) When a flight crew member has not previously completed an initial Operator's Crew Resource Management (CRM) training, then the Operator shall ensure that the flight crew member completes an initial CRM training program. New employed flight crew members shall complete initial Operator's CRM training within their first year of joining the Operator.
- (b) Initial CRM training shall be conducted by suitably qualified personnel.
- (c) Initial CRM training is conducted in accordance with a detailed course syllabus included in the Operations Manual and shall contain at least the following items:
- (1) Human factor in system safety;
  - (2) Company safety culture, Standard Operating Procedures (SOPs), organizational factors;
  - (3) Stress, stress management, fatigue and vigilance;
  - (4) Information acquisition and processing, situation awareness, workload management;
  - (5) Decision making;
  - (6) Communication and co-ordination inside and outside the cockpit;
  - (7) Leadership and team behaviour, synergy;
  - (8) Automation and philosophy of the use of automation;
  - (9) Case based studies; and

- (10) Additional areas which warrant extra attention, as identified by the Safety Management System (reference MAR-OPS 4.037).

### ***MAR-OPS 4.946 Mission qualification training***

The Operator shall ensure that:

- (a) A flight crew member completes an Operator's mission qualification training course as detailed in the Operations Manual to obtain an initial mission qualification;
- (b) Mission qualification training with integrated elements of CRM is conducted by suitably qualified personnel in accordance with a detailed course syllabus included in the Operations Manual. This syllabus shall cover training for all operational duties and taskings applicable to the flight crew member undergoing mission qualification training;
- (c) The amount of training required by the Operator's mission qualification training course is determined after due note has been taken of the flight crew member's previous training as recorded in his/her training records prescribed in MAR-OPS 4.985; and
- (d) The minimum prerequisites required for flight crew members undertaking mission qualification training are specified in the Operations Manual.

### ***MAR-OPS 4.950 Differences training***

- (a) The Operator shall ensure that a flight crew member completes differences training which requires additional knowledge and training on an appropriate training device or the RPAS when:
  - (1) Operating another variant of a RPAS of the same type currently operated; or
  - (2) Changing hardware, software, equipment, weaponry and or procedures on types or variants currently operated.
- (b) The Operator shall specify in the Operations Manual when such differences training is required.

### ***MAR-OPS 4.965 Continuation training and checking***

The Operator shall ensure that:

- (a) Each flight crew member undergoes a yearly training program as specified in the Operations Manual, to maintain his/her qualifications and competence to conduct the duties and kind of operations, assigned to him/her;
- (b) Each flight crew member undergoes recurrent training relevant for the applicable type of RPAS and type of operations in accordance with a detailed recurrent training program specified in the Operations Manual, including at least:
  - (1) Ground training;

- (2) Normal, abnormal and emergency procedure training; and
- (3) CRM training.
- (c) A checking program, including contents and periodicity, is specified in the Operations Manual consisting of at least one proficiency check and one Operator's check; and
- (d) Recurrent training and checking is conducted by suitably qualified personnel, nominated in the Operations Manual.

### ***MAR-OPS 4.970 Recent experience***

The Operator shall establish minimum requirements for recent experience of flight crew members relevant to the applicable type of RPAS. These minimum requirements shall be included in the Operations Manual.

### ***MAR-OPS 4.980 Operation on more than one type or variant***

- (a) The Operator shall ensure that a flight crew member does not operate on more than one type or variant, unless the flight crew member is competent to do so.
- (b) The Operator shall ensure that a flight crew member operating more than one type or variant complies with all of the requirements prescribed in this subpart for each type or variant unless the MAA-NLD has approved the use of credit(s) related to the qualification, continuation training and checking, and recent experience requirements.
- (c) The Operator shall specify appropriate procedures and or operational restrictions in the Operations Manual for any operation on more than one type or variant covering:
  - (1) The flight crew member's minimum experience level;
  - (2) The minimum experience level on one type or variant before beginning training for and operation of another type or variant; and
  - (3) The process whereby flight crew qualified on one type or variant will be trained and qualified on another type or variant.

### ***MAR-OPS 4.985 Training records***

The Operator shall maintain for each individual flight crew member:

- (a) Records of all training, checking and qualification prescribed in MAR-OPS 4.943, 4.946, 4.950 and 4.965 undertaken by a flight crew member; and
- (b) Records of recent experience as meant by MAR-OPS 4.970.

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## SUBPART P – Manuals, log and records

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### **MAR-OPS 4.1040 General Rules for Operations Manuals**

- (a) The Operator shall ensure that the Operations Manual contains:
- (1) All instructions and information necessary for operations personnel to perform their duties; and
  - (2) A compliance statement signed by the accountable manager.
- (b) The Operator shall ensure that the contents of the Operations Manual, including all amendments or revisions, do not contravene the terms and conditions contained in his MAOC or any applicable regulations and are acceptable to or approved by the MAA-NLD;
- (c) Unless otherwise approved by the MAA-NLD, the Operator must prepare the Operations Manual in the English language. In addition, the Operator may translate and use that manual, or parts thereof, into another language;
- (d) The Operator may issue an Operations Manual in separate volumes;
- (e) The Operator shall ensure that all operations personnel have easy access to a copy of each part of the Operations Manual which is relevant to their duties. In addition, the Operator shall supply all crew members with a personal copy of, or sections from, Parts A and B (reference MAR-OPS 4.1045) of the Operations Manual as are relevant for personal use;
- (f) The Operator shall ensure that:
- (1) The Operations Manual is amended or revised so that the instructions and information contained therein are kept up to date;
  - (2) All operations personnel are made aware of such changes that are relevant to their duties;
  - (3) When the Operations Manual is amended, the changes in the text relative to the previous issue are clearly marked; and
  - (4) Each holder of an Operations Manual or appropriate parts of it, keeps it up to date with the amendments or revisions supplied by the Operator.
- (g) The Operator shall supply the MAA-NLD with intended amendments and revisions in advance of the effective date. When the amendment concerns any part of the

Operations Manual which must be approved in accordance with MAR-OPS 4, this approval shall be obtained before the amendment becomes effective. When immediate amendments or revisions are required in the interest of safety, they may be published and applied immediately, provided that any approval required has been applied for;

- (h) In addition to sub-paragraph (g) above the Operator may use an internal procedure for the implementation of amendments to the Operations Manual, provided:
  - (1) These amendments have no impact on the scope of operation conducted under the terms and conditions of its MAOC and the approved means of compliance of any MAR-OPS 4 requirement;
  - (2) A description of specific duties and responsibilities for controlling amendments is established by the Operator and accepted by the MAA-NLD; and
  - (3) The MAA-NLD receives a copy of each amendment issued.
- (i) The Operator shall incorporate all amendments and revisions required by the MAA-NLD;
- (j) The Operator must ensure that information taken from approved documents, and any amendment of such approved documentation, is correctly reflected in the Operations Manual and that the Operations Manual contains no information contrary to any approved documentation. However, this requirement does not prevent the Operator from using more conservative data and procedures;
- (k) The Operator must ensure that the contents of the Operations Manual are presented in a form in which they can be used without difficulty. The design of the Operations Manual shall observe human factors principles; and
- (l) The Operator may be permitted by the MAA-NLD to present the Operations Manual or parts thereof in a form other than on printed paper. In such cases, an acceptable level of accessibility, usability and reliability must be assured.

### **MAR-OPS 4.1045 Operations Manual – structure and contents**

(See appendix 1 to MAR-OPS 4.1045 Operations Manual – contents)

- (a) The Operator shall ensure that the main structure of the Operations Manual is as follows:
  - (1) Part A. *General/Basic.*  
This part shall comprise all non type-related operational policies, instructions and procedures needed for a safe operation;
  - (2) Part B. *RPAS operating matters - type related.*  
This part shall comprise all type-related instructions and procedures needed for a safe operation. It shall take account of any differences between types, variants or individual RPAS used by the Operator;
  - (3) Part C. *Detailed instruction and information for standard route, area and aerodromes.*  
This part may comprise detailed instructions and information needed for frequently used routes, areas of operation, and aerodromes;
  - (4) Part D. Training.

This part shall comprise all training programs, courses and instructions for personnel required for a safe operation;

(5) Part E. *Maintenance management.*

This part shall comprise all instructions and procedures related to the Operator's continuing airworthiness responsibility; and

(6) Part F. *Ground operations.*

This part shall comprise all instructions and procedures related to the Operator's ground operations responsibility.

(b) The Operator shall ensure that the contents of the Operations Manual are in accordance with appendix 1 to this MAR-OPS 4 requirement and relevant to the area and type of operation; and

(c) The Operator shall ensure that the detailed structure of the Operations Manual is acceptable to the MAA-NLD.

### **MAR-OPS 4.1050 System Flight Manual**

The Operator shall keep a current approved SFM or equivalent document for each RPAS type operated.

### **MAR-OPS 4.1055 Flight registration book**

(a) The Operator shall retain the following information for each flight in the form of a flight registration book:

(1) RPA registration;

(2) RPS registration;

(3) Date;

(4) Name(s) of crew member(s);

(5) Assignment of RPAS Cdr;

(6) Place of departure;

(7) Place of arrival;

(8) RPA time of departure (off-block time);

(9) RPA time of arrival (on-block time);

(10) Hours of flight;

(11) Individual operating hours for each crewmember;

(12) Type of operation and or authorized mission;

(13) Calculated take-off and landing data (if applicable);

- (14) Incidents, deviations from authorized mission, observations (if any);
  - (15) The signature of the authorizing authority (or equivalent); and
  - (16) The signature of each RPAS Cdr (if applicable).
- (b) The flight registration book may be used and retained in a digitized form; and
- (c) The Operator shall ensure that all entries are made concurrently and that they are permanent in nature.

### **MAR-OPS 4.1060 Mission essential information documentation**

- (a) The Operator shall retain for each flight specific documentation containing at least the following mission essential information:
- (1) RPA registration;
  - (2) RPS registration;
  - (3) Date of flight;
  - (4) Flight identification;
  - (5) RPAS RPil and Sensor Operator (SO) names;
  - (6) Planned time of departure;
  - (7) Destination;
  - (8) Type of operation and or authorized mission;
  - (9) Coordinated data with other participating units, if applicable;
  - (10) Other safety related operational information, if applicable;
  - (11) Route and route segments with checkpoints or waypoints, distances, time and tracks;
  - (12) Planned cruising speed, flying times between checkpoints or waypoints and or estimated times overhead;
  - (13) Safe altitudes, minimum flight altitudes and or levels;
  - (14) Planned altitudes and or flight levels;
  - (15) Fuel/ electrical power calculations;
  - (16) RPAS configuration;
  - (17) Calculated take-off and landing data (if applicable);
  - (18) Planned destination alternate and, where applicable, take-off and en-route alternate(s);
  - (19) The filed ATS flight plan, if applicable;

(20) Appropriate NOtice To AirMen (NOTAM), Aeronautical Information Services (AIS) and datalink performance information; and

(21) Appropriate meteorological information.

(b) Items which are readily available from a separate retrievable source or are irrelevant to the type of operation, need not to be recorded as part of the mission essential information documentation as meant in sub-paragraph (a) above;

(c) The Operator must ensure that the mission essential information documentation and its use are described in the Operations Manual; and

(d) The Operator shall ensure that the content of mission essential information documentation is concurrent and permanent in nature.

### **MAR-OPS 4.1065 Document storage**

(See appendix 1 to MAR-OPS 4.1065 Document storage – periods)

The Operator shall ensure that:

(a) All documents, records and all relevant operational and technical information for each individual flight, are stored:

(1) For the periods prescribed in appendix 1 to this MAR-OPS 4 requirement, even if he ceases to be the Operator of the RPAS during that period;

(2) In a manner acceptable and accessible to the MAA-NLD; and

(3) In a manner that ensures protection from damage, alteration and theft.

(b) All computer hardware used as backup is stored in a different location from the hardware containing the original data; and

(c) When RPAS continuing airworthiness records are transferred from one Operator to another Operator (reference MAR-OPS 4.925), the document storage periods as prescribed in appendix 1 to this MAR-OPS 4 requirement, will continue to apply to the new Operator.

## **Appendix 1 to MAR-OPS 4.1045 Operations Manual - contents**

### **Part A. General/basic**

#### **0. Administration and control of Operations Manual**

##### 0.1 Introduction:

- Compliance statement signed by the accountable manager;
- Description of the various parts of the Operations Manual; and
- Explanations and definitions of terms and words.

##### 0.2 System of amendment and revision:

- Person(s) responsible for the issuance and insertion of amendments and revisions;
- Record of amendments and revisions;
- Amendment and (temporary) revision policy and procedures;
- Annotation policy;
- List of effective pages;
- Distribution system for the manuals, amendments and revisions; and
- Notification procedure to the Military Aviation Authority.

#### **1. Organization and responsibilities**

##### 1.1 Scope of operation and operational environments.

##### 1.2 Organizational facilities and locations.

##### 1.3 Organizational and managerial structure.

##### 1.4 Relationship concern directory:

- Chains of responsibility between the accountable manager and concern director;
- Chains of responsibility between quality manager and the applicable quality department at the concern directory level; and
- Chains of responsibility between safety manager and the applicable safety department at the concern directory level.

##### 1.5 Accountable manager.

##### 1.6 Quality manager.

##### 1.7 Safety Manager.

##### 1.8 Nominated post holders.

##### 1.9 Supervisors.

##### 1.10 Ground staff - pertaining to flight safety and the compliance with the applicable regulations.

##### 1.11 RPAS Cdr.

##### 1.12 Crew members other than the Pilot in Command.

## **2. Operational control and supervision**

2.1 Supervisory system, structure and processes.

2.2 System of promulgation of additional Operational Directives, instructions and information.

2.3 Method for exercising the Operator's responsibility with respect to the safe conduct of operations.

2.4 n/a

2.5 Alternative implementation decision-making process.

2.6 Procedure for assessment of prevailing security situations.

2.7 Exemptions:

- Procedures for submitting a petition for an exemption from any Military Aviation Requirement;
- Procedures for submitting a report regarding MAR-OPS 4 deviations; and
- Policy, procedures and the Operator decision-making process with respect to MAR-OPS 4 deviations without prior approval of the Military Aviation Authority.

2.8 Sub-contracting:

- Policies and procedures concerning sub-contracting; and
- Sub-contractor selection process and procedure.

## **3. Quality system**

A description of the quality system adopted including at least:

3.1 Quality policy statement signed by the accountable manager;

3.2 Quality plan and objectives;

3.3 Basic structure of the quality system;

3.4 Quality monitoring program;

3.5 Audit process, procedures and schedules;

3.6 A description of the quality department; and

3.7 Quality auditors' duties and responsibilities.

## **4 Safety management system**

4.1 Safety policy and objectives;

- Description of the management commitment and responsibilities;
- Description of safety accountabilities;
- Overview of designated key safety personnel;
- Overview of established safety objectives;
- Description of third party/contractor safety interfaces/activities;

- Description and coordination of the emergency response plan; and
- Description of available SMS documentation.

#### 4.2 Safety risk management:

- Hazard identification processes and procedures;
- Risk assessment and mitigation processes and procedures; and
- Description of the FDM program implemented.

#### 4.3 Safety assurance:

- Safety performance monitoring and measurement procedures;
- Internal safety investigation procedures;
- Management of change procedures; and
- Continuous improvement of the safety system.

#### 4.4 Safety training and promotion:

- Description of safety training and education; and
- Description of safety communication and promotion procedures and tools.

### **5. Qualification requirements**

5.1 Required license, rating(s), qualification and competency, experience, training checking and recency of operations personnel to conduct their duties.

5.2 Flight crew, to include operation on more than one type or variant.

5.3 n/a

5.4 Mission essential crew members.

5.5 Ground staff involved in flight operations.

5.6 Ground staff involved in crew training and checking.

5.7 Ground staff involved in ground operations.

5.8 Ground staff involved in maintenance management.

### **6. Crew health precautions instructions**

6.1 Alcohol.

6.2 Drugs and other substances.

6.3 n/a

6.4 Blood donation.

6.5 Sleep and rest.

### **7. Flight time limitations**

7.1 Flight and duty time limitations and rest scheme.

7.2 Exceedances of flight and duty time limitations and or reductions of rest periods.

## **8. Operating procedures**

### 8.1 Flight Preparation Instructions:

- Method of determination and application of minimum flight altitudes;
- Aerodrome authorization: criteria and responsibilities;
- Procedure(s) for the selection of destination and or alternate Aerodromes;
- Planning minima or a method of determination of those minima with respect to the required weather conditions for VFR portions of a flight;
- Method to select the required destination or alternate aerodromes with respect to the required weather conditions (if applicable);
- Interpretation of meteorological information;
- Fuel / power supply policy;
- Principles and methods involved in the configuration management and mass and balance system;
- Procedures with respect to the use air traffic services and tactical control services;
- Procedures and responsibilities for flight planning and briefing;
- Instructions for submission of the flight notification; and
- Documents, checklists and additional information and documentation to be present during flight.

### 8.2 Ground Handling instructions.

Instructions, to include appropriate checklists and use thereof, regarding:

- Refuelling and Defuelling procedures;
- Arming and dearming;
- De-icing and anti-icing procedures;
- RPAS movements on the ground;
- Ground operations under adverse operating conditions; and
- RPAS handling related to security.

### 8.3 Flight Procedures.

- VFR and IFR policy;
- Navigation procedures, to include:
  - In-flight replanning;
  - System degradation;
  - Navigation in area's with specified navigation performance (if applicable);
  - Navigation in RVSM airspace (if applicable);
  - Altimeter setting procedures;
  - Inadvertent IMC procedures;
  - Policy and procedures for in-flight fuel/ electrical power management;
  - Procedure regarding adverse operating conditions;
  - Take off and departure/ launch and recovery (if applicable) procedures and instructions;
  - Approach and landing procedures and instructions;
  - Wake turbulence separation criteria;
  - Procedures for the usage of RPAS lighting;
  - Procedures for the usage of electro-magnetic systems;
  - Low level flying policy and procedures;
  - Procedures for carrying weapons, munitions, expandables and external stores;

- Procedures for simulating weapon and or munition employment, while carrying live and or training weapons or munition;
- Procedures regarding unsafe weapons, munitions, and or armament system malfunctions; and
- Procedures for in-flight dispensing of expendables and external stores and, the employment of weapons and munitions.

8.4 Conditions and procedures regarding RPA handover from LRE to MCE and vice-versa.

8.5 Conditions and procedures regarding operational testing.

8.6 Safety rules: policy and instructions, to include the usages of the:

- Altitude alerting system(s); and
- Minimum altitude awareness and warning system(s).

8.7 Procedures and instructions regarding lost link profiles.

8.8 Procedures and limitations regarding miscellaneous flights, such as ferry flights, chase flights and or escorting other RPAS.

8.9 Procedures and instructions regarding demonstration flights, to include air displays, 'paradevluchten', fly passes, etc.

8.10 Procedures and instructions for the usage of the Operator's RPAS Technical Log system.

8.11 Procedures and instructions for the usage of the flight registration book.

8.12 Procedures and instructions for the usage of the Operator's Minimum Equipment List with respect to the conduct of flight operations.

8.13 Procedures and instructions for the usage of the Operator's Configuration Deviation List with respect to the conduct of flight operations.

## **9. N/A**

## **10. RPAS protection**

10.1 Protective measures and security procedures against unlawful interference.

## **11. Handling, notifying and reporting occurrences**

11.1 Procedures for the handling, notifying and reporting occurrences.

## **12. Rules of the air**

12.1 Visual and instrument flight rules.

12.2 Territorial application of the Rules of the Air.

12.3 Communication procedures including communication failure procedures.

12.4 n/a

12.5 The circumstances in which a radio listening watch is to be maintained.

12.6 Signals if applicable.

12.7 Time system used in operation.

12.8 ATC clearances, adherence to flight plan and position reports.

12.9 n/a

12.10 Procedures for pilots observing an accident or receiving a distress transmission.

12.11 The ground and air visual codes for use by survivors, description and use of signal aids.

12.12 Distress and urgency signals.

### **13. Leasing**

13.1 Required operational arrangements for leasing.

13.2 Procedures regarding leasing.

13.3 Management responsibilities.

13.4 Transfer of aircraft maintenance records.

### **14. Documentation**

14.1 Document control process and procedures.

14.2 Procedures and instructions for documentation storage and storage periods.

### **15. Appendices**

15.1 Sample documents.

15.2 List of sub-contracted organizations (if applicable).

15.3 List of quality auditors.

## **Part B. RPAS operating matters – type related**

Taking account of the differences between types, and variants of types, under the following headings.

### **0. General information**

0.1 RPAS dimensions.

0.2 Units of measurement.

0.3 Conversion tables.

### **1. Limitations**

Certified limitations and applicable operational limitations, including:

- Certification status;
- RPAS related approved types of operation;
- Mass and centre of gravity;
- Speed limitations;
- Flight envelope(s);
- Wind limits;
- Performance limitations for applicable configurations;
- Airframe contamination;
- System limitations; and
- Environmental limitations.

### **2. Normal procedures**

The normal procedures, the appropriate checklists and use thereof, including at least:

- Pre-flight;
- Walkaround (if applicable);
- (Pre-) Start-up;
- Pre-departure;
- Altimeter setting and checking;
- Taxi (if applicable), take-off/ launch and climb;
- Noise abatement;
- Cruise and descent;
- Approach and landing preparation;
- Visual approach and circling;
- Instrument approach;
- Missed approach;
- Normal landing;
- After-landing;
- (Pre-) Shut down; and
- Operation on wet and contaminated runways (if applicable).

### **3. Abnormal and emergency procedures**

The abnormal and emergency procedures, the appropriate checklists and use thereof, including at least:

- Fire and smoke in the RPS;
- Exceeding structural limits;
- Lightning strikes;

- Distress communications and alerting ATC to emergencies;
- Engine failure;
- System failures;
- Guidance for diversion;
- Windshear;
- Lost link procedures;
- Emergency landing;
- Ditching;
- Departing hardened surface (if applicable);
- Bird strikes;
- Uncommanded flight manoeuvres;
- Emergency fuel / power supply; and
- Icing procedures.

#### **4. Performance**

##### 4.1 Performance data:

- System Flight Manual approved performance data; and
- Supplementary performance data.

#### **5. Flight planning**

5.1 Data and instructions necessary for pre-flight and in-flight planning.

5.2 Method for fuel / electrical power calculation.

#### **6. Mass and balance**

6.1 Data and instructions for the calculation of the mass and balance.

6.2 Authorized standard configurations.

#### **7. Attaching and detaching external payloads**

7.1 Procedures and provisions for loading, reloading and unloading weapons, munitions, expendables and external stores.

#### **8. Configuration Deviation List**

8.1 The Operator's Configuration Deviation List(s), if provided by the manufacturer.

#### **9. Minimum Equipment List**

9.1 The Operator's Minimum Equipment List(s).

#### **10. N/A**

#### **11 N/A**

#### **12. RPA systems**

12.1 Description of RPA systems, related controls and indications and operating instructions.

### **Part C. Detailed instructions and information for standard route, area and operating site**

As required by the Operator, this Part C can be used for detailed instructions and information relating to frequently used routes, areas and operating sites. The following aspects are to be considered:

- Minimum flight level and or altitude;
- Altitude and airspeed restrictions;
- Geographical restrictions;
- Coordination with third parties;
- EMCON;
- Controlling agency requirements;
- Communication facilities and navigation aids;
- Runway data and aerodrome facilities and or information;
- Approach, missed approach and departure procedures including noise abatement procedures;
- COM-failure procedures;
- A description of the aeronautical charts that must be present in relation to the type of flight and the area of operation, including the method to check their validity;
- Availability of aeronautical information and MET-services;
- COM and NAV-procedures;
- Aerodrome categorization for flight crew competence qualification; and
- Special aerodrome limitations (performance limitations and operating procedures etc.).

## **Part D. Training**

### **1. Training programs, courses, syllabi and checking programs**

1.1 Flight crew.

1.2 n/a

1.3 Mission essential crew members.

1.4 Ground staff involved in flight operations other than crew members.

1.5 Ground staff involved in crew training and checking.

1.6 Ground staff involved in ground operations.

1.7 Ground staff involved in maintenance management.

### **2. Procedures**

2.1 Procedures for training and checking.

2.2 Procedures to be applied in the event that personnel do not achieve or maintain the required standards.

2.3 Procedures for training and checking of abnormal or emergency situations.

### **3. Appendices**

3.1 Sample documents and forms.

3.2 List of training staff.

3.3 List of checking staff.

3.4 List of contracted simulator organizations (if applicable).

## **Part E. Maintenance management**

### **1. Continued airworthiness management procedures**

- 1.1 RPAS Technical Log utilisation, MEL and CDL application.
- 1.2 RPAS Maintenance Program(s) - development, amendment and approval.
- 1.3 Time and continued airworthiness records, responsibilities, retention, access.
- 1.4 Accomplishment and control of directives.
- 1.5 Analysis of the effectiveness of the maintenance program(s).
- 1.6 Non mandatory modification embodiment policy.
- 1.7 Major modification standards.
- 1.8 Defect reports.
- 1.9 Engineering activities.
- 1.10 n/a
- 1.11 RPA weighing.
- 1.12 Maintenance manual(s) for operational and emergency equipment as far as not being part of the RPAS Maintenance Program(s) – development, amendment and approval.

### **2. N/A**

### **3. Contracted maintenance**

- 3.1 Policies and procedures concerning contracting RPAS maintenance.
- 3.2 Maintenance contractor selection procedure.
- 3.3 Quality audit of performed RPAS maintenance.

### **4. Appendices**

- 4.1 Sample documents, forms and labels.
- 4.2 List of contracted maintenance organizations.

## **Part F. Ground operations**

### **1. Ground operations procedures**

- 1.1 Pre-, thru- and post-flight inspections.
- 1.2 attaching and detaching external payloads.
- 1.3 Refuelling and defueling.
- 1.4 deploying and redeploying of all system elements.
- 1.5 arming and dearming.
- 1.6 De-icing and anti-icing, to include an Operator policy.
- 1.7 Aided and unaided RPAS movements on the ground (if applicable).
- 1.8 Launch and recovery preparation.
- 1.9 Handling of emergency RPAS.
- 1.10 Adverse operating conditions, to include an Operator policy.
- 1.11 n/a
- 1.12 Sub-contracted ground handling functions.

### **2. Appendices**

- 2.1 Sample documents, forms and labels.

## Appendix 1 to MAR-OPS 4.1065 Document storage - periods

**Table 1 – Information used for the preparation and execution of a flight**

Mission essential information documentation	3 months
Documentation required by States concerning a specific flight	3 months
Mass and balance documentation	3 months

**Table 2 – Reports**

Flight registration book	3 months
Flight report(s) for recording details of any occurrence or any event which the RPAS Cdr deems necessary to report/record	3 months
Reports on deviations from MAR-OPS 4 requirements	3 months
RIE request forms and monthly reports of Operator approved RIE's, if applicable	3 months
Reports on exceedances of duty and or reducing rest periods	3 months

**Table 3 – Flight crew records**

Licence	As long as the flight crew member is exercising the privileges of the licence for the Operator
Initial Operator's crew resource management training	3 years
Conversion training: mission qualification training	3 years
Differences training	3 years
Flight lead qualification training	3 years
Tactical instructor qualification training	3 years
Continuation training and checking	3 years
Recent experience	15 months

**Table 4 – Records for mission essential crew members**

Training/qualification records of mission essential crew members for whom a (qualification) training program is required by MAR-OPS 4	3 years
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**Table 5 – RPAS continuing airworthiness records**

All detailed maintenance records in respect of the RPAS, engine (modules) and any life-limited component fitted thereto	36 months after the RPAS or component was permanently withdrawn from service
The total time and flight cycles as appropriate, of the RPAS and all life-limited components	36 months after the RPAS or component has been permanently withdrawn from service
The time and flight cycles as appropriate, since	at least until the component

last scheduled maintenance of the component subjected to a service life limit	scheduled maintenance has been superseded by another scheduled maintenance of equivalent work scope and detail
The current status of compliance with the maintenance program such that compliance with the approved Operator's RPAS Maintenance Program(s) can be established	at least until the RPAS or component scheduled maintenance has been superseded by other scheduled maintenance of equivalent work scope and detail
The current status of continuing airworthiness related directives, requirements and or measures applicable to the RPAS and components	36 months after the RPAS or component has been permanently withdrawn from service
Details of current modifications, repairs and inspections to, as appropriate, the RPAS, engine(s), propellers, and any other component vital to flight safety	36 months after they have been permanently withdrawn from service
RPAS Technical Log	36 months after the date of the last entry

**Table 6 – RPAS and Organizational documents and manuals**

Military Air Operator Certificate	As long as the Operator is exercising the privileges of the MAOC
The Certificate(s) of Registration	As long as the RPAS is operated by the Operator
The Certificate(s) of Airworthiness	As long as the Operator is exercising the privileges of the certificate
The Noise Certificate(s), if applicable	As long as the Operator is exercising the privileges of the certificate
Radio station license(s), if applicable	As long as the Operator is exercising the privileges of the certificate
Current version of the approved parts of the Operations Manual (including all amendments to it)	at least until the current version of the OM has been superseded by a new version
The approved Operator's RPAS Maintenance Program(s) (including all amendments to it)	at least until the current version of the maintenance program has been superseded by a new version
Applicable agreements with contracted maintenance and or simulator organizations	36 months after expiration of the applicable agreement.
Applicable agreements with sub-contracted organizations	36 months after expiration of the applicable agreement.
Quality monitoring program records	36 months
Knowledge, experience and competence summary of AM, PH and QM	36 months after the AM, PH or QM is replaced

## SUBPART T – Operations requiring Special Approval

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### ***MAR-OPS 4.1300 Scope***

- (a) The operations described in this subpart go beyond the scope of a basic MAOC approval and are therefore subject to Special Approval from the MAA-NLD.
- (b) The Operator shall not conduct operations described in this subpart unless a Special Approval has been granted by the MAA-NLD (reference MAR-OPS 4 subpart C).

### ***MAR-OPS 4.1315 Privileges of an Operator holding a special approval***

An Operator holding a Special Approval shall ensure that the privileges of the Special Approval as specified on the MAOC are included in the Operations Manual.

### ***MAR-OPS 4.1330 Operations in areas with specified navigation performance***

- (a) Operations in areas with specified navigation performance (SPN).
  - (1) An Operator shall not operate a RPAS in designated airspace under the terms and conditions applicable to that airspace:
    - (i) On routes or in accordance with procedures where navigation specifications are established; or
    - (ii) Based on ICAO Regional Air Navigation Agreement, where minimum navigation performance specifications are established, unless holding a Special Approval issued by the MAA-NLD for this type of operation.
  - (2) To obtain such Special Approval, an Operator shall:
    - (i) Demonstrate that the navigation equipment of the RPAS type for which the approval is being applied, meets the required performance in terms of navigation functionality, accuracy, integrity, availability and continuity;
    - (ii) Establish in the Operations Manual and maintain a training program for the flight crew involved in these operations; and
    - (iii) Establish in the Operations Manual operating procedures specifying:
      - (A) The equipment to be carried, including its operating limitations and appropriate entries in the MEL;

- (B) Flight crew experience requirements;
  - (C) Normal procedures;
  - (D) Contingency procedures;
  - (E) Incident reporting;
  - (F) Specific regional operating procedures, in case of Minimum Navigation Performance Specifications (MNPS);
  - (G) Navigation database integrity, in case of Performance-Based Navigation (PBN); and
  - (H) Maintenance program.
- (b) The RPAS equipment for operations in MNPS areas shall comply with the ICAO Regional Air Navigation Agreement.
- (c) An Operator shall ensure that a flight does not commence unless the equipment required under this subpart is approved and installed in accordance with MAR-OPS 4.845 sub-paragraph (b) and (c).

### ***MAR-OPS 4.1335 Operations in airspace with reduced vertical separation minima***

- (a) The Operator shall not operate a RPA in designated RVSM airspace, unless holding a Special Approval issued by the MAA-NLD for this type of operation.
- (b) To obtain such Special Approval, the Operator shall:
- (1) Demonstrate that the RPAS type for which the approval is being applied, has been issued with a RVSM airworthiness approval by the MAA-NLD in accordance with MAR-21 or equivalent;
  - (2) Establish in the Operations Manual and maintain a training program for the flight crew involved in these operations; and
  - (3) Establish in the Operations Manual operating procedures specifying:
    - (i) The equipment to be carried, including its operating limitations and appropriate entries in the MEL;
    - (ii) Flight crew experience requirements;
    - (iii) Flight planning;
    - (iv) Pre-flight procedures;
    - (v) Procedures prior to RVSM airspace entry;
    - (vi) In-flight procedures;
    - (vii) Post-flight procedures;

- (viii) Maintenance program;
  - (ix) Incident reporting; and
  - (x) Specific regional operating procedures.
- (c) In addition to the equipment required by MAR-OPS 4 subpart K and L, RPAS used for operations in RVSM airspace shall be equipped with:
- (1) Two independent altitude measurement systems;
  - (2) An altitude alerting system;
  - (3) An automatic altitude control system; and
  - (4) A SSR transponder with altitude reporting system that can be connected to the altitude measurement system in use for altitude control.
- (d) The Operator shall ensure that a flight does not commence unless the equipment required under this subpart is approved and installed in accordance with MAR-OPS 4.630 (b) and (c) and MAR-OPS 4.845 sub-paragraph (b) and (c).

Intentionally left blank

## Final clauses

This requirement is known as: MAR-OPS – Military Aviation Requirements Operations 4 – Remotely Piloted Aircraft Systems (>150kg) operations and is published on the intranet site of the Ministry of Defence.

Hoofddorp, 20 July 2017

The Director of the Military Aviation Authority – The Netherlands



J.P. Apon  
Colonel